DATED

THE INSTITUTE FOR APPRENTICESHIPS AND TECHNICAL EDUCATION

and

PEARSON EDUCATION LIMITED

CONTRACT FOR THE PROVISION OF SERVICES IN RELATION TO THE HEALTH AND SCIENCE: SCIENCE T LEVEL TECHNICAL QUALIFICATION

Contents

THIS CONTRACT is made on

BETWEEN:

(1) **THE INSTITUTE FOR APPRENTICESHIPS AND TECHNICAL EDUCATION** of Sanctuary Buildings, 20 Great Smith Street, London SW1P 3BT ("**Authority**"); and

(2) **PEARSON EDUCATION LIMITED** a company registered in England and Wales (company registration number: **00872828** whose registered office is at 80 Strand, London, WC2R 0RL ("**Supplier**"),

each a "**Party**" and together the "**Parties**".

BACKGROUND TO THIS CONTRACT:

(A) On **18 March 2024** the Authority advertised in the Find a Tender Service (FTS) (reference **2024/S 000-008607**) inviting prospective suppliers to submit proposals for the design development and delivery of the technical education qualification element for the **Science** T Level.

(B) On the basis of the Supplier's response to the advertisement and a subsequent tender process, the Authority selected the Supplier as its preferred supplier of the TQ.

(C) The Parties have agreed to contract with each other in accordance with the terms and conditions set out below. As well as the delivery stage, this Contract covers the Development Phase and a Pre-Delivery Phase.

OPERATIVE TERMS:

1 Contract start, formation and interpretation

1.1 This Contract is legally binding from the Effective Date until it ends in accordance with clause 15 (*Ending or extending this Contract*).

1.2 This Contract is formed by the Core Terms and the Schedules and the Supplier must comply with all of its obligations set out in both the Core Terms and the Schedules, provided always that in the event of any conflict between the provisions of the Core Terms and the Schedules and/or the Annexes, or between any of the Schedules and/or the Annexes, the conflict shall be resolved according to the following descending order of priority:

1.2.1 the Core Terms, Schedule 1 (*Definitions and Interpretation*), and Schedule 6 (*Pricing Schedule*);

1.2.2 Schedule 2 (*Service Requirements*), Schedule 4 (*Co-operation*) and their respective Annexes; and

1.2.3 the remaining Schedules and their respective Annexes.

1.3 The Parties shall interpret this Contract using Schedule 1 (*Definitions and Interpretation*).

1.4 Where Schedule 1 (*Definitions and Interpretation*) includes an entity defined as the Guarantor, then:

1.4.1 save for clauses 1.3, 16 (*How much each Party can be held responsible for*), 19 (*What must be kept confidential*), 20 (*When information can be shared*), 21 (*Invalid parts of this Contract*), 22 (*No other terms apply*), 23 (*Other people's rights in this Contract*), 25 (*Relationships created by this Contract*), 26 (*Giving up contract rights*), 29 (*How to communicate about this Contract*), 38 (*Resolving disputes*), and 39 (*Which law applies*), this Contract is conditional upon the valid execution by the Guarantor and delivery to the Authority of the Guarantee (the "**Condition Precedent**");

1.4.2 the Supplier shall satisfy, or procure the satisfaction of, the Condition Precedent as soon as possible; and

1.4.3 in the event that the Condition Precedent is not satisfied within 10 Working Days of the Effective Date (or such other period as is agreed in advance in writing with the Authority), this Contract shall automatically cease and shall not come into effect and neither Party shall have any obligation to pay any compensation to the other Party as a result of such cessation.

2 Appointment and exclusivity

2.1 The Authority hereby appoints the Supplier as the provider of the Services in relation to the TQ during the Term.

2.2 As part of such appointment, the Supplier has the exclusive right to offer the TQ in England to Students for TQ courses for the Cohort for the Academic Years commencing at each of 1 August 2026, 1 August 2027, 1 August 2028, 1 August 2029,

1 August 2030 and, where the Authority gives written notice to the Supplier to extend this Contract pursuant to clause 15.2 (*Ending or extending this Contract*), for each of the Cohorts for the Academic Years commencing during an Extension Period, as the case may be, namely 1 August 2031, 1 August 2032, 1 August 2033 (each an "**Exclusive Cohort**").

2.3 Subject to the Supplier's compliance with the provisions of this Contract, the Authority shall not, during the Term, authorise any third party to provide goods and/or services equivalent to the Services in relation to the whole or any part of an Exclusive Cohort.

2.4 The Supplier acknowledges and agrees that during the Term the Authority may, subject to clause 2.3, authorise a third party to provide goods and/or services equivalent to the Services in relation to the TQ in England to students in cohorts outside the Exclusive Cohort, notwithstanding the continuation of the Services under this Contract in respect of any Exclusive Cohort.

2.5 The Supplier shall, subject to clause 15 (*Ending or extending this Contract*), be responsible for providing the Services to Students who are within an Exclusive Cohort until the later of the end of their TQ and 2 years following the end of the final Academic Year of the TQ for the Exclusive Cohort of which such Student was part.

2.6 Unless otherwise agreed with the Authority in writing, the TQ shall be offered by the Supplier on the basis that teaching of the TQ by Providers for each Exclusive Cohort will commence in September of the relevant Academic Year (accepting that Students may, subject to applicable Supplier and Provider rules, commence their study of the relevant TQ later than the teaching commencement date).

3 How the Services must be supplied

3.1 The Supplier must provide the Services:

3.1.1 in full compliance with the Service Requirements and the Supplier's Response, provided always that:

(i) the fact that the Supplier has complied with the Supplier's Response shall not limit the Supplier's obligation to satisfy the Service Requirements; and

(ii) the fact that the Supplier has satisfied the Service Requirements shall not limit the Supplier's obligation to comply with the Supplier's Response;

3.1.2 to a professional standard;

3.1.3 with reasonable skill and care;

3.1.4 using Good Industry Practice;

3.1.5 in accordance with its own policies, processes and quality control measures to the extent that these do not conflict with this Contract;

3.1.6 in accordance with any agreed timings set out in this Contract;

3.1.7 in accordance with Law;

3.1.8 in accordance with the Conditions of Recognition;

3.1.9 in a manner that ensures that neither it, nor any of the Supplier Staff:

(i) brings the Authority, the Department or the ESFA into disrepute by engaging in any act or omission which is reasonably likely to diminish the trust that the public places in any or all of them; and/or

(ii) engages in any act or omission which is reasonably likely to bring the T Levels Programme into disrepute,

in either case, regardless of whether or not such act or omission is related to the Supplier's obligations under this Contract; and

3.1.10 in accordance with (and in a manner consistent with enabling the Supplier and the T Level Awarding Organisations to achieve the aims set out in) Schedule 4 (*Co-operation*).

3.2 The Supplier must:

3.2.1 co-operate and, where appropriate, consult with the Stakeholders and the Authority's third-party suppliers, including but not limited to the Former Supplier, on all aspects connected with the delivery of the Services; and

3.2.2 ensure that Supplier Staff comply with any reasonable instructions of the Authority in relation to the Services.

Ofqual Recognition

3.3 The Supplier must have in place from the Effective Date and maintain throughout the Term, Ofqual Recognition.

3.4 The Supplier must comply with each Condition of Recognition throughout the Term.

Impact of approval by the Authority

3.5 The Supplier agrees and accepts that except for confirmation of a Variation pursuant to clause 28 (*Changing this Contract*), which expressly changes the Supplier's obligations or liabilities or the Authority's rights under this Contract, no review, comment, authorisation to proceed (as contemplated by clause 5.11.1) or approval by the Authority (including any IfATE Approval) in connection with any Product and/or Service (including in respect of the Supplier's Response, the Implementation and Delivery Plan, the Resource Plan and any documents or information submitted by the Supplier in order to obtain IfATE Approval) shall operate to exclude or limit the Supplier's obligations or liabilities or the Authority's rights under this Contract, and:

3.5.1 the Supplier retains sole responsibility for ensuring that the TQ (including the Products and Services) meets and continues to meet all relevant Service Requirements (as they may be amended from time to time in accordance with this Contract) throughout the Term; and

3.5.2 the Supplier acknowledges and accepts that any review, comment, authorisation to proceed or approval (including any IfATE Approval) do not constitute or imply any warranty from the Authority or Ofqual in respect of the TQ.

4 Pricing and payments

4.1 In exchange for the provision of the Services (including the supply of the Products), the Supplier must invoice:

4.1.1 the Authority for the relevant Charges, which, in the case of:

(i) the Development Charge, shall be invoiced by the Supplier at the time and in the manner set out in clauses 5.11.1(ii), or 5.13.1(ii) (*Developing the TQ and achieving IfATE Approval*) (as applicable));

(ii) that part of the Charges referred to in limb (b) of the definition of Charges, shall, unless otherwise agreed by the Authority, be invoiced by the Supplier on IfATE Approval of the relevant TQ Change; and

(iii) that part of the Charges referred to in limb (c) of the definition of Charges, shall be invoiced by the Supplier as set out in the relevant Variation; and

4.1.2 the Approved Providers for the Fees pursuant to the applicable Provider Contract.

4.2 The Supplier acknowledges and agrees that:

4.2.1 in no circumstances shall the Authority, the Department or ESFA have any liability to the Supplier in respect of the Fees. The Authority is not liable if any Provider (or other third party) fails to pay any fees or other costs (including the Fees) due from them to the Supplier; and

4.2.2 save as permitted by the relevant Provider Contract, the Supplier shall not be entitled to levy any costs and/or charges and/or require any further and/or additional payment in respect of the provision of the Services (including the supply of any Products) to any Approved Provider (and/or any Student) other than the Fees.

4.3 All Fees and Charges:

4.3.1 exclude VAT, which is payable on provision of a valid VAT invoice to the applicable payor; and

4.3.2 include all costs payable by the Authority and/or any Provider (as the case may be) in connection with the Services (including the supply of the Products).

4.4 The Authority must pay the Supplier:

4.4.1 in respect of the Development Charge, the relevant Interim Milestone Payment or the Final Milestone Payment (as the case may be); or

4.4.2 in respect of any other Charges arising under clause 8 (*TQ Changes*) or clause 28 (*Changing this Contract*), the amount of any such Charges due under such clause 8 (*TQ Changes*) or clause 28 (*Changing this Contract*),

in each case, within 30 days of receipt by the Authority of a valid, undisputed invoice, in cleared funds to the account as notified by the Supplier to the Authority.

4.5 A Supplier invoice is only valid if it includes this Contract reference and purchase order number (if any) and other details reasonably requested by the Authority.

4.6 If there is a Dispute between the Parties as to the amount invoiced by the Supplier to the Authority, the Authority must pay the undisputed amount. The Supplier cannot suspend the provision of the Services (including the supply of the Products) unless the Supplier is entitled to terminate this Contract for a failure to pay undisputed sums in accordance with clause 15.6 (*When the Supplier can end this Contract*). Any disputed amounts shall be resolved through the Dispute Resolution Procedure.

4.7 If a payment of an undisputed amount is not made by the Authority by the due date, then the Authority shall pay the Supplier interest at the interest rate specified in the Late Payment of Commercial Debts (Interest) Act 1998.

4.8 The Supplier can issue a written Reminder Notice to the Authority (in accordance with clauses 29.1 and 29.2 (*How to communicate about this Contract*)) if the Authority does not pay an undisputed invoice on time.

4.9 The Authority may retain, or set-off payment of any amount owed to it by the Supplier if notice and reasons are provided.

4.10 The Supplier must ensure that all Subcontractors are paid, in full, within 30 days of receipt of a valid, undisputed invoice. If this does not happen, the Authority can publish the details of the late payment or non-payment. The Supplier must also ensure that any Sub-Contract it enters into contains provisions which have the same effect as clauses 4.4, 4.6, 4.7 and this clause 4.10.

4.11 The Supplier has no right of set-off, counterclaim, discount or abatement unless a court orders this.

Indexation of Fees and Rate Card rates

4.12 The Supplier shall be entitled to adjust the Fees and the Rate Card rates which apply in respect of any Academic Year following the Academic Year in which the TQ is launched in accordance with the provisions of clause 4.13 to reflect the impact of inflation.

4.13 Where the Supplier wishes to adjust the Fees and/or Rate Card rates in accordance with clause 4.12:

4.13.1 the Supplier shall notify the Authority in writing of the proposed percentage adjustment in the existing Fees and/or Rate Card rates and the resulting new Fees and/or Rate Card rates by the end of February in the Academic Year prior to the Academic Year in respect of which the adjustment is to apply ("**Calculation Date**");

4.13.2 the proposed percentage adjustment to the relevant then current Fees or Rate Card rates must be no greater than the percentage increase in the preceding 12 months of the UK Consumer Price Index most recently published by the UK Office of National Statistics prior to the Calculation Date; and

4.13.3 the proposed adjustment calculated in accordance with this clause 4.13 shall not operate to adjust the Fees or Rate Card rates for the then current Academic Year but shall operate to adjust the Fees or Rate Card rates as applicable with effect from the immediately following Academic Year.

4.14 In addition to any changes to the Entry Fee by virtue of clause 4.13, the Entry Fee may be subject to change from time to time, in accordance with the provisions set out in Schedule 6A.

4.15 Except as set out in clause 4.13, neither the Charges, the Fees nor any other costs, expenses, fees or charges shall be adjusted to take account of any inflation, change to exchange rate, change to interest rate or any other factor or element which might otherwise increase the cost to the Supplier or Subcontractors of the performance of their obligations under this Contract.

5 Developing the TQ and achieving IfATE Approval

5.1 The Supplier shall develop the TQ to meet the Service Requirements and in accordance with the terms of this Contract.

Requirement for IfATE Approval

5.2 The Supplier acknowledges and accepts that:

5.2.1 the Supplier shall not make the whole or any part of the Initial TQ Deliverables available to Eligible Providers and/or Approved Providers for delivery to Students until IfATE Approval has been granted; and

5.2.2 the Supplier shall, where possible, (and in each case with the prior written consent of the Authority) share draft versions of the Initial TQ Deliverables and Guide Standard Exemplification Materials, with Eligible Providers and/or Approved Providers to support their preparations to deliver the TQ.

General development obligations

5.3 The Supplier must:

5.3.1 design and develop the TQ in accordance with paragraphs 2.1 and 2.2 of Part 1 of the Service Requirements and in order to meet the Milestones;

5.3.2 consult with:

(i) the Authority, the Department, ESFA and the Route Panels; and

(ii) a representative sample of Providers and Employers,

in the design and development of the TQ (including as contemplated by paragraph 2.1.4 of the Service Requirements);

5.3.3 take into account any input received from the Route Panel, and where applicable, the T Level Panels in the design and development of the TQ, and consult as appropriate with the T Level Panels and/or the Route Panel prior to the first Interim Milestone;

5.3.4 co-operate (as required) and work collaboratively with the Authority to achieve IfATE Approval of the TQ Service Requirements Explanatory Note;

5.3.5 take into account the Technical Qualifications Service Explanatory Note together with any guidance as issued by the Authority from time to time in the design and development of the TQ, and provide input when reasonably requested by the Authority to support the development and updating of such Technical Qualifications Service Explanatory Note; and

5.3.6 submit to the Authority an updated Implementation and Delivery Plan and Resource Plan within 5 Working Days from the Effective Date.

Development support from the Authority

5.4 The Supplier Authorised Representative and/or senior representatives of the Supplier's development team as appropriate will meet monthly (or more frequently if deemed necessary by the Authority) with the Authority Authorised Representative and/or representatives of the Authority's Commissioning & Development Team, at a time and location to be advised by the Authority, following the Effective Date until IfATE Approval of the TQ (each a "**TQ Development Meeting**") to review progress on TQ development, address key risks and identify solutions to any barriers to progress. The Authority shall issue an agenda in advance of each TQ Development Meeting. In the event that the development of the TQ is materially delayed against the Milestones and/or the dates given in the Implementation and Delivery Plan, on a written request by the Authority the Supplier's Chief Executive Officer or an equivalently senior individual shall attend the next TQ Development Meeting.

5.5 The Supplier shall:

5.5.1 not less than 5 Working Days prior to each TQ Development Meeting, submit the Development Phase Report to the Authority in respect of the relevant month, together with, without prejudice to paragraph 2.5 of Part 1 of the Service Requirements:

(i) updated versions (meeting all of the requirements of the relevant Product Description) of the following Products:

(A) the Implementation and Delivery Plan;

(B) the Resource Plan;

(C) the Risk Register; and

(D) the Issues Log; and

(ii) as requested by the Authority from time to time, the then current versions of the following:

(A) the TQ Specification;

(B) the Assessment Strategy;

(C) the TQ Specimen Assessment Materials;

(D) the Guide Standard Exemplification Materials;

(E) the Provider Approval Criteria;

(F) the Submission Issues Log;

(G) Employer & Provider Engagement Strategy; and

(H) any draft version of the Key Dates Schedule that the Supplier intends shall (if Approved) become the Key Dates Schedule for the purposes of this Contract from time to time,

it being understood that the Supplier will not be in breach of this clause 5.5.1 if the relevant item is still being developed and the Milestone for its completion has not been reached as at the date of the relevant TQ Development Meeting; and

5.5.2 provide a verbal summary at each such TQ Development Meeting of the progress of development of the TQ as against the Implementation and Delivery Plan and Resource Plan and any identified risks to the on-time delivery of the TQ and proposed resolutions.

5.6 The Authority shall provide minutes setting out an accurate summary of each such TQ Development Meeting within 5 Working Days of each such meeting.

Submission process

5.7 The Supplier shall, on or prior to the applicable Submission Date, make all Submissions to the Authority necessary in respect of IfATE Approval in accordance with paragraphs 2.1 and 2.2 of Part 1 and Annex 7 to the Service Requirements.

5.8 The Supplier shall ensure that all Submissions made in accordance with clause 5.7 meet all of the requirements for each Submission as set out in paragraph 2.1 of Part 1 and Annex 7 to the Service Requirements. Unless notified otherwise by the Authority in writing, the Supplier shall continue its ongoing work in relation to the Initial TQ Deliverables following each Submission whilst such Submission is being considered by the Authority and/or Ofqual. For the avoidance of doubt, this means that the Supplier, following each Submission for each Interim Milestone, shall not await notification from the Authority in accordance with clause 5.11 below before continuing work on the Initial TQ Deliverables required for any subsequent Milestone.

5.9 The Supplier shall submit to the Authority for Approval, a final version of the Guide Standard Exemplification Materials in accordance with paragraph 2.1 of Part 1 and Annex 7 to the Service Requirements.

5.10 The Supplier shall respond promptly to the Authority to any requests from the Authority for further information to support any Submission and/or the IfATE Approval process.

5.11 In respect of each Interim Milestone, the Authority and, if relevant, Ofqual will consider each Submission made in accordance with clause 5.7 and 5.8 and, within a timeframe which should allow the TQ to be developed in time for delivery in accordance with this Contract:

5.11.1 if the Authority considers that the Submission (or Re-Submission (as the case may be)) meets all of the requirements of paragraphs 2.1 and 2.2 of Part 1 and Annex 7 to the Service Requirements for the relevant Interim Milestone, the Authority shall:

(i) confirm in writing to the Supplier that such requirements have been met; and

(ii) where the relevant Interim Milestone attracts an Interim Milestone Payment, pay to the Supplier (in accordance with clause 4 (*Pricing and payments*)) the applicable Interim Milestone Payment; or

5.11.2 if (1) the Authority does not consider that the Submission (or Re-Submission (as the case may be)) meets all of the requirements of

paragraphs 2.1 and 2.2 of Part 1 and Annex 7 to the Service Requirements for the relevant Interim Milestone and/or (2) the Supplier has outstanding issues still to be addressed / additional information still to be provided in relation to any previous Interim Milestones (including in relation to any previous Interim Milestones that do not attract an Interim Milestone Payment), the Authority may withhold payment to the Supplier of the applicable Interim Milestone Payment (if any) and shall:

(i) notify the Supplier of the issues that need to be addressed and/or the additional information that needs to be provided (and, acting reasonably, the date by which such issues need to be addressed and/or such information needs to be provided) and whether the Authority will be withholding payment of the applicable Interim Milestone Payment (if any), and the Supplier shall promptly address such issues and resubmit the relevant documentation and/or provide such additional information (a "**Re-Submission**") to the Authority on or prior to the date notified by the Authority, following which clause 5.11.1 or this clause 5.11.2 will apply to such Re-Submission; or

(ii) notify the Supplier:

(A) that notwithstanding the failure of the Submission (or Re-Submission (as the case may be)) to meet all of the requirements of paragraphs 2.1 and 2.2 of Part 1 and Annex 7 to the Service Requirements for the relevant Interim Milestone, the Supplier shall continue with the design and development of the TQ without having to make a Re-Submission, provided that the relevant issues are addressed by any timescales specified by the Authority and in any event no later than by the Final Approval Milestone Date; and

(B) whether the Authority will be withholding payment of the applicable Interim Milestone Payment (if any), following which the Supplier shall promptly address the issues identified / further information required, as part of its ongoing development of the TQ in accordance with the timescales

specified by the Authority. If the Authority is withholding payment of any applicable Interim Milestone Payment, subject to the Supplier having addressed the issues identified in accordance with the required timescales (and in any event no later than by the Final Approval Milestone Date), clause 5.11.1(ii) will apply.

5.12 The Supplier acknowledges and agrees that owing to the meeting dates scheduled for the IfATE Approval process, any delay in making the Final Submission to the Authority by the Final Approval Milestone Date may cause a delay of several weeks for IfATE Approval. Accordingly, failure by the Supplier to make the Final Submission in accordance with clause 5.7 and/or 5.8 by the Final Approval Milestone Date, other than due to a breach of this Contract by the Authority, shall be a Critical Service Failure.

5.13 In respect of the Final Approval Milestone, the Authority and, if relevant, Ofqual will consider the Final Submission made by the Supplier in accordance with clause 5.7 and 5.8 and, within a timeframe which should allow the TQ to be developed in time for delivery in accordance with this Contract:

5.13.1 if the Authority considers that the Final Submission (or Final Re-Submission (as the case may be)) meets the requirements for IfATE Approval, then the Authority shall:

(i) confirm to the Supplier in writing that the TQ has IfATE Approval and that, subject (if applicable) to clause 7.2 (*Interaction with* Providers) and clause 14.3.1 (*What may happen if there are issues with your provision of the Services*), the Supplier is authorised to proceed to make the TQ available to Approved Providers for delivery to Students in accordance with clause 6 (*Operating the TQ*); and

(ii) pay to the Supplier (in accordance with clause 4 (*Pricing and payments*)) the Final Milestone Payment, together with any outstanding Interim Milestone Payments or;

5.13.2 if the Authority considers that the Final Submission (or Final Re-Submission (as the case may be)) does not meet the requirements for IfATE Approval, then the Authority shall either

(i) notify the Supplier in writing of the issues that need to be addressed and/or the additional information that needs to be provided and the Supplier shall within 10 Working Days (or such longer timeframe as is agreed in writing by the Authority) address such issues and resubmit the relevant documentation and/or provide such additional information, following which this clause 5.13 will apply to such Final Re-Submission or

(ii) take any other steps available to it under the contract.

5.14 The Supplier acknowledges and accepts that the Authority will share, as it deems necessary, with Ofqual, the Department, ESFA, and the Route Panel:

5.14.1 all Submissions (including any Final Submission) and/or Re-Submissions (including any Final Re-Submissions) submitted by the Supplier under clause 5.7 and/or clause 5.13;

5.14.2 any information required by the Authority pursuant to clause 5.10;

5.14.3 any information required by Ofqual for the Regulation of the TQ or to perform the statutory functions of Ofqual; and/or

5.14.4 any other information it holds in relation to the Supplier,

and the provisions of clause 19 (*What must be kept confidential*) will not prevent any disclosure or sharing of documentation and/or information by the Authority under this clause 5.14.

6 Operating the TQ

6.1 Following IfATE Approval the Supplier must (subject to clause 7.2 (*Interaction with Providers*) and clause 14.3.1 (*What may happen if there are issues with your provision of the Services*)) make the TQ (including (as applicable) the Products) available to Approved Providers for delivery to Students and provide the Services (other than the Initial Development Services) in accordance with the Service Requirements.

6.2 The Supplier shall meet all KPIs in the delivery of the Services (other than the Initial Development Services).

6.3 The Supplier must comply with the current version of any Key Dates Schedule in respect of the making available of the TQ and the performance of the Services (other than the Initial Development Services).

6.4 The Supplier must provide materials and Student Information to the Authority in accordance with paragraphs 5, 8 and 10 of Part 1 of the Service Requirements to enable the Authority to keep a record in the event such materials and/or information is required for the transfer of Services to a Replacement Supplier.

6.5 The Supplier shall promptly provide to the Authority such materials relating to the TQ and Student Information as are requested in writing by the Authority to enable work by or on behalf of the Authority and/or Ofqual to ensure the ongoing maintenance between Cohorts of the grades and standards of the TQ and the wider T Level Programme.

6.6 The Supplier shall actively promote the TQ to Eligible Providers.

7 Interaction with Providers

7.1 The Supplier shall, in accordance with the requirements set out in paragraph 3 of Part 1 of the Service Requirements, operate a procedure to receive applications for Provider Approval from Eligible Providers that wish to make the TQ available to Students, and where the relevant Provider Approval Criteria are met to grant Provider Approval and notify the Approved Providers accordingly. The Supplier acknowledges and agrees that:

7.1.1 it shall not be entitled or permitted to:

(i) charge any additional costs, charges and/or fees arising out of or in connection with the implementation and operation of such procedure and/or the granting of Provider Approval; and/or

(ii) impose any additional requirements (other than a Provider Contract) on any Eligible Provider and/or Approved Provider (as applicable) as a condition to and/or consequence of the grant of Provider Approval;

7.1.2 only an Eligible Provider shall be eligible to be granted Provider Approval by the Supplier in respect of the TQ; and

7.1.3 subject to clause 7.1.2 and without prejudice to paragraph 3.1.1 of Part 1 of the Service Requirements, the Supplier shall promptly grant Provider Approval to Eligible Providers who meet the Provider Approval Criteria following receipt of their application for Provider Approval.

7.2 The Supplier shall review and assess Approved Providers on an ongoing basis in accordance with paragraph 3.1.2 of Part 1 of the Service Requirements to ensure that they continue to meet the requirements for Provider Approval to make the TQ available to Students and, subject to the provisions of paragraphs 3.2 to 3.5 (inclusive) of Part 1 of the Service Requirements, where an Approved Provider no longer meets the Provider Approval Criteria, the Supplier shall revoke such Provider Approval.

7.3 The Supplier shall ensure that:

7.3.1 prior to any Eligible Provider making the TQ available to Students:

(i) the Eligible Provider is an Approved Provider;

(ii) a binding Provider Contract is in place with the relevant Approved Provider; and

7.3.2 the Provider Services shall only be provided to an Approved Provider during the term of, and subject to the provisions of, the applicable Provider Contract.

7.4 Without prejudice to paragraph 5 of Part 1 of the Service Requirements, the Supplier shall promptly register a Student for the TQ following receipt by the Supplier of an application for registration of that Student from an Approved Provider.

7.5 The Supplier shall, on written request by the Authority, promptly provide a copy of each Provider Contract to the Authority and to the Department and/or the ESFA.

7.6 The Supplier shall retain copies of all documentation and information in relation to arrangements with Eligible Providers and Approved Providers, including all such documentation and/or information arising out of or in connection with:

7.6.1 the application for and/or the grant of Provider Approval referred to in clause 7.1; and

7.6.2 the ongoing monitoring of Approved Providers by the Supplier referred to in clause 7.2,

and without prejudice to the generality of the definition of IfATE Data, such documentation and information shall form part of the IfATE Data to which the provisions of clause 18 (*Data protection and information*) shall apply.

7.7 The Supplier shall make available the Additional Services and provide the Additional Services on request by Approved Providers in accordance with paragraphs 5, 6, and 9 of Part 1 of the Service Requirements.

7.8 The Supplier shall be permitted to offer and provide additional products and/or services in each case related to the TQ to Approved Providers (and Students), provided always that:

7.8.1 such additional products and services are not identical to, or performing an equivalent function in relation to the TQ to, the whole or any part of the Products and/or the Services (including the Additional Services) and offered and/or provided on alternative terms and/or conditions (including as to timing or quality) to those terms and conditions which would apply pursuant to this Contract to the applicable Products and/or Services;

7.8.2 without prejudice to clause 7.1.1(ii) and the requirements of Schedule 17 (*Provider Contract Requirements*), the Supplier shall not, other than the Provider Contract, impose any condition on any Eligible Provider (including any Approved Provider) and/or Student to purchase such additional products and/or services as a condition to and/or consequence of:

(i) the grant of any Provider Approval; and/or

(ii) the proper performance of any of the Services (and/or the supply of any Products); and

7.8.3 the Supplier shall not (in making available such products and/or services available and/or in respect of the terms on which such products and/or services are made available) favour one Provider and/or group of Providers or one Student and/or group of Students over another.

7.9 The Supplier shall comply with Schedule 17 (*Provider Contract Requirements*) in respect of its contracts with Approved Providers in relation to the TQ.

8 TQ Changes

8.1 The Supplier acknowledges and agrees that the Authority may request changes to the TQ and that the Authority may publish revised Outline Content from time to time.

8.2 The Supplier must ensure that the Approved Initial TQ Deliverables reflect the version of the Former Supplier's TQ Specification as at the Effective Date ("**Initial Content Date**") and that the Approved Initial TQ Deliverables reflect any TQ Change requested by the Authority before IfATE Approval.

8.3 The Supplier must make any TQ Change reasonably requested by the Authority to reflect any changes to the Former Supplier's TQ Specification or, if relevant, the Outline Content following the Initial Content Date subject to the terms of this clause 8.

8.4 The Authority may carry out annual reviews in each Academic Year where a new Cohort is commencing the TQ in the following Academic Year to identify any potential TQ Changes required by the Authority. The Authority may prepare and submit to the Supplier by the relevant dates prescribed by the TQ Content Updating Schedule in each such Academic Year up to two annual guidance notes setting out the output of the Authority's reviews in relation to Inclusive TQ Changes and Exclusive TQ Changes respectively. Where the Authority identifies any potential TQ Change (in an annual guidance note or otherwise), the Authority shall promptly notify the Supplier in writing of details of the potential TQ Change.

8.5 Without prejudice to paragraphs 2.5 and 2.6 of Part 1 of the Service Requirements which shall apply in addition to any annual review, the Supplier shall carry out an annual review of the TQ once in each Academic Year, taking into account the output of any Authority annual guidance note(s) pursuant to clause 8.4 and any additional updates the Supplier has proposed to the TQ (to the extent that such updates have not otherwise been Approved pursuant to paragraph 2.5 or 2.6 of Part 1 of the Service Requirements), to identify any potential TQ Changes required to ensure ongoing compliance of the TQ with the Service Requirements. Where the Supplier identifies any potential TQ Change, the Supplier shall promptly notify the Authority in writing of details of the potential TQ Change.

8.6 Where a TQ Change is an Exclusive TQ Change, the Parties shall follow the Variation procedure set out in clause 28 (*Changing this Contract*) in respect of the relevant Exclusive TQ Change. The Charges relating to such Exclusive TQ Change shall be agreed between the Parties as part of the Impact Assessment for the relevant

Variation, each Party acting reasonably and promptly, prior to the Supplier commencing work on the Exclusive TQ Change. The relevant Charges shall:

8.6.1 be a reasonable cost for implementing the Exclusive TQ Change in the circumstances;

8.6.2 take into account and be calculated using:

(i) for personnel related costs and other relevant charges which are set out in the Rate Card, the applicable Rate Card rates; and

(ii) reasonable charges for any non-personnel related costs which are not included in the Rate Card and which will be incurred by the Supplier to implement the Exclusive TQ Change; and

8.6.3 be consistent with the costs applicable to any relevant costed change scenario set out in Schedule 6 (*Pricing Schedule*) or, where no costed change scenario for the applicable TQ Change is set out in Schedule 6 (*Pricing Schedule*), be calculated on the same basis and using the same logic and inputs as those which applied to determine the costs for the costed change scenarios, as such logic and inputs may be amended only to the extent as is necessary to reflect the TQ Change in question.

8.7 Where the TQ Change is an Inclusive TQ Change, the Supplier shall implement such Inclusive TQ Change at the cost of the Supplier and there shall be no additional Charges or Fees as a result of such Inclusive TQ Change.

8.8 The Supplier shall obtain the Authority's prior written agreement before implementing any TQ Change which, in the case of an Exclusive TQ Change, shall be in the form of an executed Variation to this Contract. Following such agreement the Supplier shall, unless otherwise agreed with the Authority, implement:

8.8.1 Inclusive TQ Changes such that the updated TQ is ready for teaching to new Students in the next Academic Year following the date of such agreement; and

8.8.2 Exclusive TQ Changes such that the updated TQ is ready for teaching to new Students in the second Academic Year following the date of such agreement,

provided that in each case that the Supplier shall continue to make available the version of the TQ prior to such TQ Change as is necessary to support continuing Students who commenced their studies on such version of the TQ prior to the implementation of such TQ Change.

8.9 The Supplier shall consult with a representative sample of relevant Employers and take into account the output of consultation with such Employers as appropriate in relation to any TQ Change in accordance with the Service Requirements and shall provide the Authority with evidence of such consultation.

8.10 If the Supplier makes any Inclusive TQ Changes, the Supplier must resubmit the TQ documentation including any Products (as amended to reflect the TQ Change in question) to the Authority for agreement by the relevant date prescribed by the TQ Content Updating Schedule, unless otherwise agreed with the Authority, before (where applicable) making the relevant revised version of the TQ available to Approved Providers for delivery to Students.

8.11 If the Supplier makes any Exclusive TQ Changes, the Supplier must resubmit the TQ documentation including any Products (as amended to reflect the TQ Change in question) to the Authority for IfATE Approval by the relevant date prescribed by the TQ Content Updating Schedule, unless otherwise agreed with the Authority, before (where applicable) making the relevant revised version of the TQ available to Approved Providers for delivery to Students and the provisions of clause 5.13 shall apply to such amended TQ documentation as if references to the "Final Submission" (or "Final Re-Submission" (as the case may be)) in that clause 5.13 are references to the "TQ documentation including any Products (as amended to reflect the TQ Change in question)"; reference to the "Final Approval Milestone" is a reference to the "TQ Change in question"; and references to payment refer to payment of any charges agreed in the applicable Variation.

8.12 Unless otherwise agreed with the Authority in writing, any agreed or approved (as the case may be) updates to the TQ must (where applicable) be made available to Approved Providers by the Supplier by the relevant date prescribed by the TQ Content Updating Schedule.

9 Record keeping, monitoring and reporting

9.1 Without prejudice to clause 5.5 (*Developing the TQ and achieving IfATE Approval*) and clause 7.6 (*Interaction with Providers*), the Supplier shall:

9.1.1 monitor and report (in an Operational Delivery Report) its performance of the Services (other than the Initial Development Services) in accordance with Schedule 15 (*Monitoring of Performance*) and the Parties agree that ethe provisions of such Schedule 15 (*Monitoring of Performance*) shall apply to determine (amongst other things) the process following (and the outcome of) such monitoring and reporting (including in relation to the carrying out of the Performance Review Meeting and the requirement for and consequences of any KPI Improvement Plan); and

9.1.2 comply with the record keeping and reporting obligations set out in paragraphs 5, 8 and 10 of Part 1 of the Service Requirements.

9.2 The Supplier must allow, and must ensure that any Key Subcontractor allows, any Auditor access to the Supplier's or Key Subcontractor's premises and/or systems (including IT systems), as relevant, to Audit everything to do with this Contract and/or to obtain any information required in relation to any investigation by Ofqual.

9.3 The Supplier must provide, and must ensure that any Key Subcontractor provides, information to the Auditor and reasonable co-operation at the Auditor's request to enable any Audit to be undertaken.

9.4 The Supplier must create and maintain throughout the Term a full and accurate version control log recording all TQ Changes made during the Term.

9.5 The Supplier shall maintain and shall promptly, following a written request by the Authority, provide to the Authority, the following:

9.5.1 the Supplier's detailed and up to date cost model for the provision of the Services under this Contract including a future projection for the remaining Term;

9.5.2 details of the income received by the Supplier through the provision of the Services during the Term to date, including a breakdown by service and customer and a future projection for the remaining Term; and

9.5.3 the Supplier's calculation of the overall level of profit it has achieved during the Term to date through the Services provided under this Contract.

10 Staff Transfer

10.1 The Parties agree that:

10.1.1 where the commencement of the provision of the Services or any part of the Services results in one or more Relevant Transfers, Schedule 21 (Staff Transfer) shall apply; and

10.1.2 Schedule 12 (Exit Management) shall apply on the expiry or termination of the Services or any part of the Services.

11 Supplier Staff and Subcontracting

Supplier Staff

11.1 The Supplier Staff involved in the performance of this Contract must:

11.1.1 be appropriately trained and qualified; and

11.1.2 be vetted using Good Industry Practice and, in the case of Supplier Staff referred to in paragraph 2.2 of Schedule 7 (*Staff (including Key Personnel*)), in accordance with paragraph 2 of Schedule 7 (*Staff (including Key Personnel*)).

11.2 If any default, acts, omissions, negligence and/or statements of any of the Supplier Staff involved in the performance of this Contract result in a Default, the Supplier is liable to the Authority for that Default.

11.3 Where the Authority decides (on reasonable grounds) that one of the Supplier's Staff is not suitable to work on this Contract, the Supplier must, subject to clause 11.1, promptly replace them with a suitably qualified alternative.

11.4 If requested by the Authority, the Supplier must replace any person whose acts or omissions have caused the Supplier to breach clause 31 (*Preventing fraud, bribery and corruption*).

Subcontracting

11.5 The Supplier shall comply with the provisions of Schedule 8 (*Supply Chain (including approved Subcontractors)*) in respect of the appointment (including any proposed

appointment) and/or management of any Subcontractor (including any Key Subcontractor).

11.6 Sub-contracting any part of this Contract shall not relieve the Supplier of any obligation or duty attributable to the Supplier under this Contract.

12 Rights and protection

12.1 The Supplier warrants and represents that:

12.1.1 it has full capacity and authority to enter into and to perform this Contract;

12.1.2 this Contract is executed by its authorised representative;

12.1.3 it is a legally valid and existing organisation incorporated in the place it was formed;

12.1.4 there are no known legal or regulatory actions or investigations before any court, administrative body or arbitration tribunal pending or threatened against it or its Affiliates that might affect its ability to perform this Contract;

12.1.5 it maintains all necessary rights, authorisations, licences and consents to perform its obligations under this Contract;

12.1.6 it does not have any contractual obligations which are likely to have a material adverse effect on its ability to perform this Contract;

12.1.7 it is not subject to an Insolvency Event; and

12.1.8 all statements made, and documents submitted, as part of the procurement of the Services (including in the Supplier's Response) are true and accurate.

12.2 The warranties and representations in clause 12.1 are repeated each time the Supplier provides the Services and/or supplies any Products under this Contract.

12.3 The Supplier indemnifies the Authority in full against all Losses suffered or incurred by the Authority arising out of or in connection with third party claims that result from the provision of the Services including the supply of the Products.

12.4 All claims indemnified under this Contract (including for the avoidance of doubt any indemnified IPR Claim) must use the process set out in clause 30 (*Dealing with claims*).

12.5 The Authority can, even if it has made a claim in respect of the breach, still terminate this Contract for breach of any warranty or indemnity where it is entitled to do so.

12.6 If the Supplier becomes aware of a representation or warranty that becomes untrue or misleading, it must immediately notify the Authority.

13 Intellectual Property Rights

Vesting, ownership, and licences of rights in TQ materials

13.1 The Supplier agrees to deliver such materials, and to assign or licence all IPR in such materials, as it creates, identifies for use, or uses as part of or for the Operation of the TQ to which the Authority and/or a Replacement Supplier with Relevant Competence would reasonably require access:

13.1.1 for the Authority to carry out its activities in relation to the T Level and TQ, including the approval, oversight and maintaining the integrity of the T Level and TQ;

13.1.2 for the transfer of the Operation of the TQ to a Replacement Supplier; and

13.1.3 for the Replacement Supplier to Operate (including maintaining the integrity of, modifying and developing) the TQ,

in a seamless, Transparent manner; and

13.1.4 to compete openly and effectively any future competition or tender for the Operation of the TQ or a Replacement TQ.

13.2 Without limiting the generality of clause 13.1:

13.2.1 the Supplier agrees to assign to the Authority all IPR in the Key Materials (including in Products) in accordance with the TQ Assignment and Licence;

13.2.2 the Supplier agrees to licence the Authority, with the right to sublicense, all IPR in the Ancillary Materials, in accordance with the TQ Assignment and Licence; and

13.2.3 in respect of any IPR in Key Materials, to the extent that the same are not at the relevant time vested absolutely in the Authority, the Supplier agrees to license the Authority, with the right to sublicense, such IPR in Key Materials, in accordance with the TQ Assignment and Licence.

13.3 Except as set out above or otherwise expressly provided in this Contract:

13.3.1 the Authority shall not by virtue of this Contract acquire title to or rights in any Background IPR owned by the Supplier or any third party; and

13.3.2 the Supplier shall not by virtue of this Contract acquire title to or rights in any Background IPR owned by the Authority or licensed by any third party to the Authority.

13.4 Without prejudice to the other provisions of this Contract, the assignments and licences referred to in clause 13.2 shall be subject to the terms of the TQ Assignment and Licence (during and after the Term), including the warranties and representations set out in the TQ Assignment and Licence. The Authority and the Supplier will enter into the TQ Assignment and Licence in the form set out in Schedule 14 (*Form of Assignment and Licence*) on the Effective Date.

Rights granted to the Supplier

13.5 The Authority hereby grants to the Supplier a non-exclusive worldwide, royalty free licence with the right to sublicense, subject to, and in accordance with, the terms of this Contract, to use:

13.5.1 the Former Supplier's TQ Specification and, if relevant, the Outline Content;

13.5.2 the IfATE Data; and

13.5.3 any Authority Background IPR in other materials specifically identified for use in the provision of the Services in accordance with this sub-clause,

during the Term, solely in relation to the provision of the Services.

13.6 The Authority hereby grants to the Supplier, in so far as any relevant Intellectual Property Rights have been assigned to the Authority or are otherwise at the time vested in the Authority in accordance with clause 13.2 a worldwide, royalty free licence, with the right to sublicense, to use and exploit the IPR in the Key Materials during the Term in relation to the TQ subject to, and in accordance with, the relevant terms of this Contract.

13.7 Subject to clause 13.8, the licence to the Supplier under clause 13.6 shall be exclusive during the Term solely in respect of use of the Key Materials for the provision of the Services in respect of the Exclusive Cohorts.

Rights retained by the Authority for its activities related to the provision of the Services

13.8 The Authority will retain:

13.8.1 (for the avoidance of doubt) the non-exclusive right to use the Key Materials in its administration, approval and oversight of the TQ and other T Level technical education qualifications and to make the same available to others (such as Ofqual) to do the same; and

13.8.2 the right to use the Key Materials, and for any Future Supplier or potential Future Supplier to use the Key Materials:

(i) for competing or tendering for the delivery and Operation of the TQ and/or any Replacement TQ, where such competition or tender is for such delivery and Operation during any Transition Period and/or following expiry or termination of this Contract (ie the End Date); and

(ii) to deliver and Operate the TQ and/or any Replacement TQ, during any Transition Period; and

13.8.3 the right to sub-license others to exercise the rights set out in this clause 13.8.

Confirmation of rights, marking and branding of Materials

13.9 The Supplier shall, on any copy of any materials in which copyright belongs to the Authority, prominently mark such material with a notice saying: “Copyright in this [DOCUMENT/section of DOCUMENT] belongs to, and is used under licence from, the Institute for Apprenticeships and Technical Education [DATE]” or such other notice as the Authority may reasonably require by notice to the Supplier from time to time. Without prejudice to any rights granted to the Authority under this Contract, in the case of each Deliverable the Supplier shall deliver a certificate in the form annexed to the TQ Assignment and Licence confirming that ownership in the IPR in that Deliverable is vested in the Authority, or where it asserts that IPR in the Deliverable or certain parts of it do not vest in the Authority, identifying specifically those parts and the scope of rights it asserts the Supplier has in respect of the same.

13.10 The Supplier may use its name, logos, trade marks and/or other signs which refer to the Supplier on Key Materials and Ancillary Materials and other materials used in the Operation of the TQ or to promote the TQ which are of the type set out in the T Level Branding Guidelines, provided that any such use shall be strictly as set out in the T Level Branding Guidelines. Without prejudice to the last sentence, the Supplier shall, on notice from the Authority, provide representative samples of all such use, and, if the notice so requests, provide such samples a reasonable period in advance of any proposed such use together with a period (not being less than 7 Working Days) for comment. The Authority may notify the Supplier within such period of any comments, including any requirements it has in respect of such use, and, the Supplier shall take reasonable account of any such comments and comply with any reasonable requirements of the Authority so notified.

13.11 The Supplier shall not use its name, logos, trade marks and/or other signs which refer to the Supplier, in a trade mark manner or as any designation of origin, on any material referred to in clause 13.10 or otherwise in connection with its Operation of T Levels or T Level technical education qualifications (including the TQ), except as provided in clause 13.10 or otherwise with the specific Approval of the Authority; and in any event any use of its name, logos, trade marks and/or other signs which refer to the Supplier in connection with the T Level or T Level technical education qualifications (including the TQ) shall not be such as to make, suggest or imply any connection between the Authority or any T Levels or any T Level technical education qualifications and the Supplier, or endorsement by the Authority or the Department, other than as arises under this Contract or any other contract for the supply of T Level technical education qualifications.

13.12 The Supplier shall:

13.12.1 apply to all Key Materials and Ancillary Materials provided to any third party, the Authority's name and logo in such manner as is reasonably prescribed from time to time in writing by the Authority; and

13.12.2 use in respect of the TQ, including, unless otherwise agreed with the Authority, on all Key Materials and Ancillary Materials, such descriptive name (for example in the form: "[technical qualification] in Construction") as is determined by the Authority or proposed by the Supplier and agreed by the Authority,

provided that such use shall at all times be in strict accordance with the other provisions of this Contract, the T Level Trade Mark Licence, and any style guides or other instructions issued from time to time by the Authority.

Supplier's operation of other qualifications

13.13 The Supplier shall not, within or outside England, offer or promote any qualification other than the TQ as:

13.13.1 being the TQ (or any other technical qualification forming part of a T Level) or T Level (or part of a T Level);

13.13.2 being identical in terms of content and assessment requirements to the TQ (or any other technical qualification forming part of a T Level) or T Level and/or including identical components to the TQ (or any other technical qualification forming part of a T Level) or T Level; or

13.13.3 demonstrating the same level of occupational competence as the TQ (or any other technical qualification forming part of a T Level) or T Level,

provided always that nothing in this Contract shall prevent the Supplier from offering or promoting the technical qualification element of a T Level under a separate contract with the Authority in connection with the making available of that technical qualification.

13.14 The Supplier may only re-use the whole of the TQ in an un-amended or materially un-amended form, other than as part of the Services during the Term, as follows:

13.14.1 in the Operation of qualifications for any of the Devolved Administrations, with the specific Approval of the Authority;

13.14.2 in the Operation of qualifications in England intended for and only marketed to students who are not in the category known as "16 to 19 year old", with the specific Approval of the Authority; and

13.14.3 in the Operation of qualifications outside the UK, save in any jurisdictions the Authority excludes by notice to the Supplier,

provided in each case that the name “T Level” is not used in the qualification or any marketing or promotion of the qualification, and that it is at all times clear and made clear to students and other third parties that the qualification does not form and cannot be used as any part of a T Level

13.15 Subject to clauses 13.13 and 13.14, nothing in this Contract or the TQ Assignment and Licence shall restrict or prevent the Supplier from continuing to offer and update its existing qualifications (including technical qualifications), from offering new technical qualifications, or from using elements of the Key Materials in the operation of qualifications other than the TQ.

Dealing with intellectual property claims

13.16 If there is an IPR Claim, the Supplier indemnifies the Authority against all Losses suffered or incurred by the Authority as a result.

13.17 Where a Party acquires ownership of IPR incorrectly under this Contract it must do everything reasonably necessary to complete a transfer in writing assigning the IPR to the other Party on request and at its own cost.

13.18 Clause 13.16 shall not apply to the extent that the IPR Claim is caused by the Authority’s use of the relevant IPR in breach of the terms of this Contract.

13.19 In the event that any Third Party IPR is included in the Key Materials, Ancillary Materials, or other Deliverables under this Contract, the Supplier shall ensure that it has or acquires sufficient rights to any such Third Party IPR to enable it to enter into any applicable assignments and to grant any applicable licences under this Contract.

Portability of the TQ

13.20 The Supplier shall, where possible, ensure that its design and development of the TQ enables the transfer of the materials described in clause 13.1 to a Future Supplier without requiring use by such Future Supplier of any underlying proprietary system or platform which does not form part of the Key Materials or Ancillary Materials.

14 What may happen if there are issues with your provision of the Services

14.1 The Supplier must notify the Authority promptly in writing if:

14.1.1 it becomes aware of any problem or complaint from any individual or organisation in relation to the making available and/or operation of the TQ;

14.1.2 it makes any changes to its management, governance, organisational and/or operational structure or capacity from that which is set out in the Supplier's Tender which shall or may be material to the provision of the Services;

14.1.3 it becomes aware of any circumstances relating to the Supplier or any Subcontractor which shall or may bring into disrepute and/or diminish the trust that the public places in the Authority, the Department or the ESFA and/or the T Levels Programme (including any Conflict of Interest (as contemplated by clause 36 (*Conflict of interest*)) and/or any child protection and/or data handling issues and/or incidents);

14.1.4 it becomes aware of any issue which shall or may have an adverse impact on Students studying for the TQ;

14.1.5 it is required, pursuant to the Conditions of Recognition, to notify Ofqual of any event that has occurred (or is likely to occur) which it has cause to believe could have an "Adverse Effect" (as defined in the Conditions of Recognition);

14.1.6 any of the circumstances in clause 15.7 (*Ending or extending this Contract*) occur; or

14.1.7 a Critical Service Failure occurs.

14.2 If:

14.2.1 the Supplier has failed to make the Submission for the relevant Interim Milestone on or prior to the Submission Date for that relevant Interim Milestone;

14.2.2 the Authority reasonably believes that:

(i) the Supplier is not likely to achieve IfATE Approval by the Final Approval Milestone Date;

(ii) the Authority is likely to need to withdraw IfATE Approval;

(iii) Ofqual is likely to need to withdraw Ofqual Recognition;

14.2.3 the Authority has obtained information giving rise to reasonable concerns about the ability of the Supplier to deliver the Services and the Authority has provided such information to the Supplier and given the Supplier a reasonable opportunity (in the circumstances) to respond to such information and any such response fails to address such concerns to the satisfaction of the Authority;

14.2.4 the Supplier fails, in the opinion of Ofqual, to comply with any Condition of Recognition;

14.2.5 the Supplier is under investigation and/or subject to regulatory enforcement by Ofqual or has had any direction issued by Ofqual in respect of it;

14.2.6 the Supplier fails to comply with and/or implement (as the case may be) the whole or any part of the Implementation and Delivery Plan in any material respect;

14.2.7 the Supplier fails to deliver the Services in accordance with the Resource Plan in any material respect;

14.2.8 the circumstances referred to in paragraph 2.3.2 of Schedule 15 (*Monitoring of Performance*) occur;

14.2.9 a Supplier Termination Event has occurred; and/or

14.2.10 any act or omission of the Supplier in relation to the TQ in breach of this Contract occurs which shall or may have a material adverse impact on Students and/or the TQ including any such act or omission which:

(i) gives rise to prejudice to Students or potential Students; or

(ii) adversely affects:

(A) the ability of the Supplier to undertake the development, delivery or award of the TQ in accordance with its Conditions of Recognition;

(B) the standards of the TQ which the Supplier makes available or proposes to make available; or

(C) public confidence in the TQ,

the Authority may issue written notification of Designated Action to the Supplier, following which the Supplier shall comply with the Designated Action in accordance with any timeframe stated in such notification. In the event that, for any reason, the Supplier is unable to comply with the Designated Action notification, the Supplier shall promptly notify the Authority and shall explain the reason why it is unable to so comply.

14.3 In the event of a Critical Service Failure, in addition to the rights of the Authority under clause 14.2 (*What may happen if there are issues with your provision of the Services*) and 15.3 (*Ending or extending this Contract*), the Authority may by serving written notice on the Supplier:

14.3.1 suspend and/or restrict any elements (in full or part) of the Services for the remainder of the Term, including a permanent prohibition or restriction on the Supplier from providing the Services (including making the TQ and/or any Products available to Approved Providers):

(i) to Cohorts (including any Exclusive Cohort) in respect of which Students are already registered for the TQ; and/or

(ii) in respect of any further Cohorts (including any Exclusive Cohort);

14.3.2 reduce the Term by one or more periods of 12 months as specified in such notice and accordingly remove one or more Cohorts from the Exclusive Cohorts; and/or

14.3.3 require the Supplier to comply with specified performance improvement conditions in relation to the Services, failing which the Term will reduce by one or more periods of 12 months as specified in such notice and the final Cohort will then be removed from the Exclusive Cohorts.

14.4 Nothing in this Contract (and no action by the Authority) shall be construed so as to limit or restrict the ability of Ofqual to take action under its statutory powers and in the event of any Dispute arising out of or in connection with Ofqual Recognition and/or any Condition of Recognition the provisions of clause 38.7 (*Resolving disputes*) will apply.

14.5 The Supplier shall provide (and shall procure that its Subcontractors provide) all information and cooperation as is required by the Authority to enable the Authority to investigate any alleged breach by the Supplier of its obligations under this Contract.

14.6 The Authority may withdraw IfATE Approval by notice in writing to the Supplier in circumstances where the requirements for IfATE Approval are no longer met by the Supplier. The Authority shall notify the Supplier in advance in writing of its proposal to withdraw IfATE Approval and shall provide a reasonable opportunity for the Supplier to make representations in relation to such proposal, and the Authority shall take such representations into account in determining whether to proceed to withdraw IfATE Approval.

15 Ending or extending this Contract

15.1 This Contract ends on the End Date.

Extending this Contract

15.2 The Authority can extend this Contract for an Extension Period by giving the Supplier written notice prior to the start of the Academic Year in which the final Exclusive Cohort commences the TQ.

When the Authority can end this Contract

15.3 If a Supplier Termination Event occurs, the Authority has the right to immediately terminate this Contract by issuing a Termination Notice to the Supplier, unless the Supplier Termination Event occurs as a result of a breach of this Contract by the Authority, but only insofar as the Authority's breach is not itself caused by a breach by the Supplier of the Supplier's obligations under this Contract.

15.4 Nothing in clause 38 (Resolving Disputes) shall prevent or restrict the Authority from exercising its rights under clause 15.3.

What happens if this Contract ends

15.5 Where the Authority terminates this Contract, all of the following apply:

15.5.1 the Supplier shall apply to Ofqual, in accordance with the instructions of the Authority, for its Ofqual Recognition in respect of the TQ to be withdrawn;

15.5.2 the accumulated rights of the Authority are not affected;

15.5.3 the Authority grants to the Supplier a non-exclusive worldwide, royalty free irrevocable licence to use the IfATE Data solely to the extent that such IfATE Data consists of: (i) information relating to the identities of Providers

and persons engaged by them, which it shall be entitled to use for any purpose; and (ii) Student Related Data provided that no individual Student can be identified from such Student Related Data, which it shall be entitled to use for research purposes in order to develop or improve upon any Supplier qualification (including material prepared, and training provided, in support of such qualification);

15.5.4 the Supplier must promptly return (or, where required by the Authority, delete) the IfATE Data except where required to retain copies by Law, the Conditions of Recognition, or for the purposes of exercising its rights under the licence granted under clause 15.5.3.

15.5.5 the Supplier must promptly return any of the Authority's property provided to it under this Contract;

15.5.6 the Supplier must at no cost to the Authority reasonably co-operate in the re-procurement and/or handover of the Services (including to a Replacement Supplier);

15.5.7 the Supplier must comply with the relevant provisions of Schedule 12 (*Exit Management*); and

15.5.8 this clause 15.5 and the following clauses survive the termination of this Contract: clauses 9, 12.3, 13, 16, 18, 19, 20, 22, 38 and 39 and any clauses and/or Schedules which are expressly or by implication intended to continue.

When the Supplier can end this Contract

15.6 The Supplier can terminate this Contract by issuing a Termination Notice if the Authority fails to pay any Charges which have fallen due under this Contract and which are directly payable by the Authority within 30 days of the date of a Reminder Notice issued by the Supplier in respect of such sum.

15.7 If the Supplier terminates this Contract under clause 15.5:

15.7.1 the Authority must promptly pay all outstanding Charges referred to in clause 15.5 to the Supplier; and

15.7.2 clauses 15.5.1 to 15.5.8 shall apply.

When Sub-Contracts can be ended

15.8 At the Authority's request, the Supplier must terminate (or procure the termination of (as the case may be)) any Sub-Contracts in any of the following events:

15.8.1 there is a change of Control of the relevant Subcontractor which is not pre-approved in writing by the Authority and which the Authority believes shall or may have an adverse impact on the Services;

15.8.2 the acts or omissions of the relevant Subcontractor have caused or materially contributed to a right of the Authority to terminate this Contract;

15.8.3 a Supplier Termination Event is caused or contributed to by the relevant Subcontractor or where any analogous events referred to in limbs (b), (d), (e), (f), (g), (h), (j) or (l) of the definition of Supplier Termination Event occurs in respect of the Subcontractor; or

15.8.4 the relevant Subcontractor sub-contracts any of its obligations in relation to the Services in breach of the requirements of this Contract.

16 How much each Party can be held responsible for

16.1 Subject to the following provisions of this clause 16 each Party's total aggregate liability under this Contract (whether in tort, contract or otherwise) for each claim or series of connected claims is no more than £1,000,000.

16.2 No Party is liable to the other for:

16.2.1 any indirect, special, or consequential Loss; or

16.2.2 loss of profits, turnover, savings, business opportunities or damage to goodwill (in each case whether direct or indirect), provided always that, subject to clause 16.1, the Supplier acknowledges that the Authority may, amongst other things, recover from the Supplier the following Losses incurred by the Authority, the Department and/or the ESFA, to the extent that they arise as a result of a Default by the Supplier:

(i) any additional operational and/or administrative costs and expenses, including costs relating to time spent by or on behalf of the Authority in dealing with the consequences of the Default;

(ii) any wasted expenditure or charges;

(iii) the additional cost of procuring Replacement Services for the remainder of the Contract Period, which shall include any incremental costs associated with such Replacement Services above those which would have been payable under this Contract;

(iv) any compensation or interest paid to a third party by the Authority; and

(v) any fine or penalty pursuant to Law and any costs in defending any proceedings which result in such fine or penalty.

16.3 The Authority does not give any warranty or undertaking as to the relevance, completeness, accuracy or fitness for purpose of any data information and/or documentation disclosed by or on behalf of the Authority prior to or after the Effective Date and neither the Authority nor any of its employees or agents shall be liable (howsoever arising) for any inaccuracy, omission, unfitness for purpose or inadequacy of any kind whatsoever in any such data information and/or documentation.

16.4 Nothing in this Contract shall operate to exclude or limit the liability of either Party in relation to the following:

16.4.1 its liability for death or personal injury caused by its negligence, or that of its employees, agents or subcontractors;

16.4.2 bribery or fraud or fraudulent misrepresentation by it or its employees; or

16.4.3 any liability that cannot be excluded or limited by Law.

16.5 Each Party must use its reasonable endeavours to mitigate any Losses which it suffers under or in connection with this Contract, including where any such Losses are covered by an indemnity.

16.6 When calculating the Supplier's liability under clause 16.1, Losses covered by Required Insurances will not be taken into consideration.

17 Insurance

17.1 Without prejudice to its obligations to the Authority under this Contract, including its indemnity obligations, the Supplier shall take out and maintain at its own cost, or

procure the taking out and maintenance of, the Required Insurances. The Supplier shall ensure that each of the Required Insurances is effective no later than the date on which the relevant risk commences.

17.2 The Required Insurances shall be maintained in accordance with Good Industry Practice and (so far as is reasonably practicable) on terms no less favourable than those generally available to a prudent contractor in respect of risks insured in the international insurance market from time to time.

17.3 The Required Insurances shall be taken out and maintained with insurers who are: (a) of good financial standing; (b) appropriately regulated; and (c) of good repute in the international insurance market.

17.4 The Supplier shall not take any action or fail to take any action or (insofar as is reasonably within its power) permit anything to occur in relation to it which would entitle any insurer to refuse to pay any claim under any of the Required Insurances.

17.5 Where the Supplier has failed to purchase any of the Required Insurances or maintain any of the Required Insurances in full force and effect, the Authority may elect (but shall not be obliged) following written notice to the Supplier to purchase the relevant Required Insurances, and the Authority shall be entitled to recover the reasonable premium and other reasonable costs incurred in connection therewith as a debt due from the Supplier.

17.6 The Supplier shall upon the Effective Date and within 15 Working Days after the renewal or replacement of each of the Required Insurances, provide evidence, in a form satisfactory to the Authority, that the Required Insurances are in full force and effect and meet in full the requirements of this clause 17. Receipt of such evidence by the Authority shall not in itself constitute acceptance by the Authority or relieve the Supplier of any of its liabilities and obligations under this Contract.

17.7 The Supplier shall ensure that the public and products liability policy forming part of the Required Insurances shall contain an indemnity to principals clause under which the Authority shall be indemnified in respect of claims made against the Authority in respect of death or bodily injury or third-party property damage arising out of or in connection with the Services and for which the Supplier is legally liable.

18 Data protection and information

18.1 Each Party shall comply with the Data Protection Legislation.

18.2 The Supplier must ensure that Personal Data is Processed in accordance with Schedule 9 (*Data Handling and Security Management*).

18.3 The Supplier must not remove any ownership or security notices in or relating to the IfATE Data.

18.4 The Supplier must make accessible back-ups of all IfATE Data, stored in an agreed off-site location. The Supplier must send the Authority copies every six Months of the Ancillary Materials and the Key Materials (in each case to the extent that these have not already been provided to the Authority), and any further information falling within the definition of IfATE Data as may be requested by the Authority in writing from time to time.

18.5 The Supplier must ensure that any Supplier system holding any IfATE Data, including back-up data, is a secure system that complies with the Security Policy and the relevant provisions of Schedule 9 (*Data Handling and Security Management*).

18.6 If at any time the Supplier suspects or has reason to believe that the IfATE Data provided or generated under this Contract is corrupted, lost or sufficiently degraded, then the Supplier must notify the Authority and immediately suggest remedial action.

18.7 If the IfATE Data is corrupted, lost or sufficiently degraded so as to be unusable the Authority may either or both:

18.7.1 tell the Supplier to restore or get restored IfATE Data as soon as practical but no later than 5 Working Days from the date that the Authority receives notice, or the Supplier finds out about the issue, whichever is earlier; and/or

18.7.2 restore the IfATE Data itself or using a third party.

18.8 The Supplier must pay each Party's reasonable costs of complying with clause 18.7 unless the Authority is at fault.

18.9 The Supplier:

18.9.1 must provide the Authority with all IfATE Data in an agreed open format within 10 Working Days of a written request;

18.9.2 must have documented processes to guarantee prompt availability of IfATE Data if the Supplier stops trading;

18.9.3 must securely destroy all Storage Media that has held IfATE Data at the end of life of that media using Good Industry Practice;

18.9.4 must securely erase all IfATE Data and any copies it holds when asked to do so by the Authority unless required by Law to retain it; and

18.9.5 indemnifies the Authority against any and all Losses suffered or incurred by the Authority if the Supplier and/or any Key Subcontractor breaches this clause 18 and/or any Data Protection Legislation.

19 What must be kept confidential

Confidential Information

19.1 Each Party must, subject to the following provisions of this clause 19;

19.1.1 keep all Confidential Information it receives confidential and secure;

19.1.2 not disclose, use or exploit the Confidential Information disclosed by the Disclosing Party without the Disclosing Party's prior written consent, except for the purposes anticipated under this Contract; and

19.1.3 immediately notify the Disclosing Party if it suspects unauthorised access, copying, use or disclosure of the Confidential Information.

19.2 Notwithstanding clause 19.1, a Party may disclose Confidential Information which it receives from the Disclosing Party in any of the following instances:

19.2.1 where disclosure is required by applicable Law or by a court with the required jurisdiction, if the Recipient Party (to the extent that it is permitted to do so by such applicable Law or by such court) notifies the Disclosing Party in advance of disclosure of the full circumstances, the affected Confidential Information and extent of the disclosure;

19.2.2 if the Recipient Party already had the information without obligation of confidentiality before it was disclosed to it by the Disclosing Party;

19.2.3 if the information was given to it by a third party without obligation of confidentiality;

19.2.4 if the information was in the public domain at the time of the disclosure;

19.2.5 if the information was independently developed without access to the Confidential Information of the Disclosing Party;

19.2.6 to its auditors or for the purposes of regulatory requirements;

19.2.7 on a confidential basis, to its professional advisers on a need-to-know basis;

19.2.8 to the Serious Fraud Office where the Recipient Party has reasonable grounds to believe that the Disclosing Party is involved in activity that may be a criminal offence under the Bribery Act 2010; and/or

19.2.9 where disclosure is permitted in accordance with Schedule 4 (*Co-operation*).

19.3 The Supplier may disclose Confidential Information on a confidential basis to Supplier Staff on a need-to-know basis to allow the Supplier to meet its obligations under this Contract. The Supplier must ensure that the Supplier Staff enter into a direct confidentiality agreement with the Authority at the Authority's request.

19.4 The Authority may disclose Confidential Information in any of the following cases:

19.4.1 on a confidential basis to the employees, agents, consultants and contractors of the Authority;

19.4.2 on a confidential basis to any Crown Body, any successor body to a Crown Body or any company that the Authority transfers or proposes to transfer all or any part of its business to;

19.4.3 where permitted by the Apprenticeships, Skills, Children and Learning Act 2009, (including to the Department, ESFA or Ofqual and as contemplated by clause 5.14 (*Developing the TQ and achieving IfATE Approval*);

19.4.4 if the Authority (acting reasonably) considers disclosure necessary or appropriate to carry out its public functions;

19.4.5 where requested by Parliament;

19.4.6 under clauses 4.10 (*Pricing and payments*) and 20 (*When information can be shared*); or

19.4.7 save for Exit Information, where the information was generated as part of the provision of the Services.

19.5 For the purposes of clauses 19.2 to 19.4 references to disclosure on a confidential basis means disclosure under a confidentiality agreement or arrangement including terms as strict as those required in this clause 19.

Student Related Data

19.6 The Supplier must:

19.6.1 keep all Student Related Data confidential and secure;

19.6.2 immediately notify the Authority if it suspects unauthorised access, copying, use or disclosure of the Student Related Data.

19.7 The Supplier shall not store, copy, disclose, or use the Student Related Data except as necessary for the performance by the Supplier of its obligations under this Contract or as otherwise expressly authorised in writing by the Authority.

Transparency Information and other disclosures

19.8 Transparency Information and any information which is exempt from disclosure by clause 20 (*When information can be shared*) is not Confidential Information.

19.9 The Supplier must not make any press announcement or publicise this Contract or the output of the Services (including the Student Related Data) without the prior written consent of the Authority and must take all reasonable steps to ensure that Supplier Staff do not either.

20 When information can be shared

20.1 The Supplier acknowledges that:

20.1.1 the Transparency Reports; and

20.1.2 the content of this Contract, including any changes to this Contract agreed during the Term, except for (i) any information which is exempt from disclosure in accordance with the provisions of the FOIA, which shall be determined by the Authority; and (ii) Commercially Sensitive Information,

(together the "**Transparency Information**") is not Confidential Information.

20.2 The Supplier must tell the Authority within 48 hours if it receives a Request For Information.

20.3 Within the timescales required by the Authority, the Supplier must give the Authority full co-operation and information needed so the Authority can:

20.3.1 publish the Transparency Information; and

20.3.2 comply with any Request for Information.

20.4 The Supplier acknowledges that the Authority may be required under the FOIA and EIRs to disclose information (including Confidential Information and Commercially Sensitive Information) without consulting or obtaining consent from the Supplier. However, to the extent that it is permitted to do so (in accordance with the Secretary of State's section 45 Code of Practice on the Discharge of the Functions of Public Authorities under Part 1 of the FOIA), the Authority shall, in relation to any Request for Information relating to Confidential Information or Commercially Sensitive Information of the Supplier:

20.4.1 notify the Supplier of such Request for Information as soon as is reasonably practicable; and

20.4.2 allow the Supplier to make representations in relation to any exemptions the Supplier considers may apply to the disclosure of its information under the Request for Information and take such representations into account when making its decision of what it will disclose.

20.5 Notwithstanding any other provision in this Contract, the Authority shall be responsible for determining in its absolute discretion whether any Commercially Sensitive Information and/or any other information is exempt from disclosure in accordance with the FOIA and/or the EIRs.

21 Invalid parts of this Contract

21.1 If any part of this Contract is held to be void or otherwise unenforceable by any court of competent jurisdiction, such part shall to the extent necessary to ensure that the remaining provisions of this Contract are not void or unenforceable be deemed to be deleted and the validity and/or enforceability of the remaining provisions of this Contract shall not be affected.

22 No other terms apply

22.1 The provisions incorporated into this Contract are the entire agreement between the Parties. This Contract replaces all previous statements and agreements whether written or oral. No other provisions apply.

23 Other people's rights in this Contract

23.1 The Department may enforce any of the Authority's rights under this Contract in relation to which the Department is to benefit. The Department's consent is not required to amend this Contract.

23.2 Save as provided in clause 23.1 or expressly stated in this Contract, no third parties shall be entitled to enforce any term of this Contract.

24 Circumstances beyond either Party's control

24.1 Any Party affected by a Force Majeure Event is excused from performing its obligations under this Contract while the inability to perform continues, if it both:

24.1.1 provides a Force Majeure Notice to the other Party; and

24.1.2 uses all reasonable measures to reduce the impact of the Force Majeure Event.

24.2 The Authority can terminate this Contract if the provision of the Services is materially affected by a Force Majeure Event which lasts for 90 days continuously.

24.3 Where the Authority terminates under clause 24.2:

24.3.1 each Party must cover its own Losses; and

24.3.2 subject to clause 24.3.1, clause 15.4 applies.

24.4 Neither Party can rely on clause 24.1 where the inability to perform its obligations arises, directing or indirectly, due to the exit from the European Union by the United Kingdom.

24.5 The Supplier may not rely on clause 24.1 to the extent that the inability to perform its obligations arises directly or indirectly out of a failure by the Supplier to comply with its Business Continuity Plan.

25 Relationships created by this Contract

25.1 This Contract does not create a partnership, joint venture or employment relationship. The Supplier must represent itself accordingly and ensure the Supplier Staff do so.

26 Giving up contract rights

26.1 A partial or full waiver or relaxation of the terms of this Contract by one Party is only valid if it is stated to be a waiver in writing to the other Party.

27 Transferring responsibilities

27.1 The Supplier must not assign, transfer or otherwise dispose of its rights, obligations and/or liabilities under the whole or any part of this Contract without Approval.

27.2 The Authority can assign, novate or transfer this Contract or any part of it to any Crown Body, public sector body or private sector body which performs the functions of the Authority.

27.3 The Supplier must enter into a novation agreement in the form that the Authority specifies where the Authority wishes to exercise its rights under clause 27.2.

27.4 The Supplier can terminate this Contract novated under clause 27.2 to a private sector body where an Insolvency Event occurs in respect of that private sector body.

27.5 The Supplier remains responsible for all acts and omissions of the Supplier Staff as if they were its own.

28 Changing this Contract

28.1 If any change is required which is an Inclusive TQ Change, clause 8 (*TQ Changes*) shall apply in relation to such change, and this clause 28 shall not apply to any Inclusive TQ Change.

28.2 Either Party can request a Variation to this Contract, including the addition or removal of one or more Occupational Specialist Components.

28.3 The Supplier cannot unreasonably withhold or delay their consent to a Variation to this Contract.

28.4 The Supplier must provide an Impact Assessment either:

28.4.1 with the Variation Form, where the Supplier requests the Variation; or

28.4.2 within the time limits included in a Variation Form where the Authority requests the Variation.

28.5 If the Variation cannot be agreed or resolved by the Parties, the Authority can either:

28.5.1 agree that this Contract continues without the Variation; or

28.5.2 treat such failure as a Dispute which shall be addressed through the Dispute Resolution Procedure.

28.6 A Variation of this Contract is only effective if agreed in writing and signed by both Parties.

28.7 If there is a General Change in Law, the Supplier must bear the risk of the change and is not entitled to ask for an increase to the Charges and/or the Fees in respect of that change.

28.8 If there is a Specific Change in Law or one is likely to happen during the Contract Period, the Supplier must give the Authority notice of the likely effects of the Specific Change in Law as soon as reasonably practical. The Supplier must also say if it thinks any Variation is needed either to the Services, the Products and/or this Contract and provide evidence:

28.8.1 that the Supplier has kept costs as low as possible and/or maximised any cost savings (as the case may be) including any Subcontractor costs; and

28.8.2 of how it has affected or will affect the Supplier's costs and/or those of any Subcontractor.

28.9 Any Variation because of a Specific Change in Law must be implemented using clauses 28.1 to 28.6.

28.10 If another awarding organisation has a contract with the Authority for the provision of services similar to the Services to deliver a different technical qualification as part of the T Levels Programme and that other awarding organisation suffers a Supplier Termination Event following which its contract with the Authority is terminated or the relevant contract is otherwise lawfully terminated, the Supplier agrees that the Authority shall have the option to request that the Supplier takes over the delivery of that different technical qualification and any related services as a Variation, which will be implemented using clauses 28.1 to 28.6. The Charges and Fees relating to such a Variation shall be agreed between the Parties as part of the Impact Assessment for the relevant Variation, each Party acting reasonably and promptly, prior to the Supplier commencing work on the Variation. The relevant Charges and Fees shall:

28.10.1 be a reasonable cost for implementing the Variation in the circumstances;

28.10.2 take into account the charges and fees that the other awarding organisation was charging in relation to that different technical qualification prior to suffering the Supplier Termination Event; and

28.10.3 take into account and be calculated using:

(i) for personnel related costs and other relevant charges which are set out in the Rate Card, the applicable Rate Card rates; and

(ii) reasonable charges for any non-personnel related costs which are not included in the Rate Card and which will be incurred by the Supplier to implement the Variation; and

(iii) the same basis and the same logic used by the Supplier to determine the relevant costs, Charges and Fees for the Services.

29 How to communicate about this Contract

29.1 All notices under this Contract must be in writing and are considered effective on the Working Day of delivery as long as delivered before 5:00 pm on a Working Day. Otherwise, the notice is effective on the next Working Day. Unless expressly stated in this Contract or otherwise communicated in writing by the Authority, an email is not effective notice unless also sent by post or delivered by hand on the same day. For the avoidance of doubt, this clause 29.1 does not apply to a Variation, which must be implemented in accordance with clauses 28.2 to 28.6.

29.2 Subject to clause 29.1, notices to the Authority must be sent to the Authority Authorised Representative's address and email address, and all notices must be copied to the Authority's Head of Commercial Delivery Management [redacted] and the Authority's General Counsel [redacted]

29.3 Subject to clause 29.1, notices to the Supplier must be sent to the Supplier Authorised Representative's address and email address.

29.4 This clause does not apply to the service of legal proceedings or any documents in any legal action, arbitration or dispute resolution.

30 Dealing with claims

30.1 If a Beneficiary is notified of or otherwise becomes aware of a Claim then it must notify the Indemnifier as soon as reasonably practical and no later than 10 Working Days after such notification or date of first awareness.

30.2 At the Indemnifier's cost the Beneficiary must both:

30.2.1 allow the Indemnifier to conduct all negotiations and proceedings to do with a Claim; and

30.2.2 give the Indemnifier reasonable assistance with the Claim if requested.

30.3 The Beneficiary must not make admissions about the Claim or enter into any agreement or compromise in relation to the Claim without the prior written consent of the Indemnifier which cannot be unreasonably withheld or delayed.

30.4 The Indemnifier must consider and defend the Claim diligently using competent legal advisors and in a way that does not damage the Beneficiary's reputation (or, in the case of the Authority as a Beneficiary, the reputation of the Authority, the Department and/or the ESFA or the wider T Levels Programme).

30.5 The Indemnifier must not settle or compromise any Claim without the Beneficiary's prior written consent which it must not unreasonably withhold or delay.

30.6 Each Beneficiary must take all reasonable steps to minimise and mitigate any losses that it suffers because of the Claim.

30.7 If the Indemnifier pays the Beneficiary money under an indemnity and the Beneficiary later recovers money which is directly related to the relevant Claim, the Beneficiary must immediately repay the Indemnifier the lesser of either:

30.7.1 the sum recovered minus any legitimate amount spent by the Beneficiary when recovering this money; or

30.7.2 the amount the Indemnifier paid the Beneficiary for the Claim.

31 Preventing fraud, bribery and corruption

31.1 The Supplier must not during the Term:

31.1.1 commit a Prohibited Act or any other criminal offence in regulations 38(8), 38(9) and/or 38(10) of the Regulations; and/or

31.1.2 do or allow anything which would cause the Authority, including any of its employees, consultants, contractors, subcontractors or agents to breach any of the Relevant Requirements or incur any liability under them.

31.2 The Supplier must during the Term:

31.2.1 create, maintain and enforce adequate policies and procedures to ensure it complies with the Relevant Requirements to prevent a Prohibited Act and require its Subcontractors to do the same;

31.2.2 keep full records to show it has complied with its obligations under this clause 31 and give copies to the Authority on request; and

31.2.3 if required by the Authority, within 20 Working Days of the Effective Date, and then annually, certify in writing to the Authority, that it has complied with this clause 31, including compliance of Supplier Staff, and provide reasonable supporting evidence of this on request, including its policies and procedures.

31.3 The Supplier must immediately notify the Authority if it becomes aware of any breach of clauses 31.1 or 31.2, or has any reason to think that it, or any of the Supplier Staff, has either:

31.3.1 been investigated or prosecuted for an alleged Prohibited Act;

31.3.2 been debarred, suspended, proposed for suspension or debarment, or is otherwise ineligible to take part in procurement programmes or contracts because of a Prohibited Act by any Crown Body;

31.3.3 received a request or demand for any undue financial or other advantage of any kind related to this Contract; or

31.3.4 suspected that any person or Party directly or indirectly related to this Contract has committed or attempted to commit a Prohibited Act.

31.4 If the Supplier notifies the Authority as required by clause 31.3, the Supplier must respond promptly to the Authority's further enquiries, co-operate with any investigation and allow the Audit of any relevant books, records and documentation.

31.5 In any notice the Supplier gives under clause 31.4 it must specify the:

31.5.1 Prohibited Act;

31.5.2 identity of the party who it thinks has committed the Prohibited Act; and

31.5.3 action it has decided to take.

32 <u>Equality, diversity, human rights and modern slavery</u>

32.1 The Supplier must perform its obligations under this Contract (including those in relation to the Services), in accordance with:

32.1.1 all applicable equality Law (whether in relation to race, sex, gender reassignment, religion or belief, disability, sexual orientation, pregnancy, maternity, age or otherwise); and

32.1.2 any other requirements and instructions which the Authority reasonably imposes related to equality Law.

32.2 The Supplier must perform its obligations under this Contract (including those in relation to the Services) giving consideration to the Authority's Equity, Diversity and Inclusion toolkit as published on the Authority's website or provided to the Supplier from time to time.

32.3 The Supplier must take all necessary steps, and inform the Authority of the steps taken, to prevent anything that is considered to be unlawful discrimination by any court or tribunal, or the Equality and Human Rights Commission (or any successor organisation) when working on this Contract.

32.4 The Supplier must use Good Industry Practice to ensure that there is no slavery or human trafficking in its supply chains and must notify the Authority immediately if it becomes aware of any actual or suspected incidents of slavery or human trafficking in its supply chains.

32.5 The Supplier must at all times conduct its business in a manner that is consistent with any anti-slavery policy of the Authority and shall provide to the Authority any reports or other information that the Authority may request as evidence of the Supplier's compliance with this clause 32.4 and/or as may be requested or otherwise required by the Authority in accordance with any Authority anti-slavery policy.

33 Health and safety

33.1 The Supplier must perform its obligations meeting the requirements of:

33.1.1 all applicable Law regarding health and safety;

33.1.2 the Authority's current health and safety policy, as provided to the Supplier, to the extent that Supplier Staff are located at any Authority premises in the course of performing the Services under this Contract.

34 Environment

34.1 The Supplier must ensure that Supplier Staff are aware of and comply with the Environmental Policy.

35 Tax

35.1 The Supplier must not breach any tax or social security obligations and must enter into a binding agreement to pay any late contributions due, including where applicable, any interest or any fines.

35.2 Where the Supplier or any Supplier Staff are liable to be taxed or to pay National Insurance contributions in the UK relating to payment received under this Contract, the Supplier must both:

35.2.1 comply with the Income Tax (Earnings and Pensions) Act 2003 and all other statutes and regulations relating to income tax, the Social Security Contributions and Benefits Act 1992 (including IR35) and National Insurance contributions; and

35.2.2 indemnify the Authority against any Income Tax, National Insurance and social security contributions and any other liability, deduction, contribution, assessment, or claim arising from or made during or after the Term in connection with the provision of the Services by the Supplier or any Supplier Staff.

36 Conflict of interest

36.1 The Supplier must take action to ensure that neither the Supplier nor the Supplier Staff are placed in the position of an actual or potential Conflict of Interest.

36.2 The Supplier must promptly notify and provide details to the Authority if a Conflict of Interest happens or is expected to happen.

36.3 The Authority can terminate this Contract immediately by giving notice in writing to the Supplier or take any steps it thinks are necessary where there is or may be an actual or potential Conflict of Interest.

37 Reporting a breach of this Contract

37.1 As soon as it is aware of it, the Supplier and Supplier Staff must report to the Authority any actual or suspected breach of:

37.1.1 Law; or

37.1.2 clauses 31 to 36 (inclusive).

37.2 The Supplier must not retaliate against any of the Supplier Staff who in good faith report a breach listed in clause 37.1 to the Authority or a Prescribed Person.

38 Resolving disputes

38.1 If there is a Dispute, nominated senior representatives of each Party who have authority to settle the Dispute will, within 28 days of a written request from the other Party, meet in good faith to resolve the Dispute.

38.2 If the Dispute is not resolved at that meeting, the Parties can attempt to settle it by mediation using the Centre for Effective Dispute Resolution ("**CEDR**") Model Mediation Procedure current at the time of the Dispute. If the Parties cannot agree on a mediator, the mediator will be nominated by CEDR. If either Party does not wish to use, or continue to use mediation, or mediation does not resolve the Dispute, the Dispute must be resolved using clauses 38.3 to 38.5.

38.3 Unless the Authority refers the Dispute to arbitration using clause 38.4, the Parties irrevocably agree that the courts of England and Wales have the exclusive jurisdiction to:

38.3.1 determine the Dispute; and/or

38.3.2 grant interim remedies, or any other provisional or protective relief.

38.4 The Supplier agrees that the Authority has the exclusive right to refer any Dispute to be finally resolved by arbitration under the London Court of International Arbitration Rules current at the time of the Dispute. There will be only one arbitrator. The seat or legal place of the arbitration will be London and the proceedings will be in English.

38.5 The Authority has the right to refer a Dispute to arbitration even if the Supplier has started or has attempted to start court proceedings under clause 38.3 unless the Authority has agreed to the court proceedings or participated in them. Even if court proceedings have started, the Parties must do everything necessary to ensure that the court proceedings are stayed in favour of any arbitration proceedings if they are started under clause 38.4.

38.6 The Supplier cannot suspend the performance of this Contract during any Dispute.

38.7 To the extent that a Dispute relates to whether or not the Supplier has complied with a Condition of Recognition and/or requirement of Ofqual Recognition, the Parties agree that they shall request that Ofqual shall make the final decision as to whether the requirements of that Condition of Recognition and/or Ofqual Recognition have been met and any such decision by Ofqual shall be binding on both Parties.

39 Which law applies

39.1 This Contract and any issues arising out of, or connected to it, are governed by English law.

Signed by

PEARSON EDUCATION LTD:

Signed by

THE INSTITUTE FOR APPRENTICESHIPS AND TECHNICAL EDUCATION

Schedule 1

Definitions and Interpretation

1 Interpretation

1.1 In this Contract, unless the context otherwise requires, capitalised expressions shall have the meanings set out in this Schedule 1 (*Definitions and Interpretation*) or the relevant Schedule in which that capitalised expression appears.

1.2 If a capitalised expression does not have an interpretation in this Schedule or any other Schedule, it shall, in the first instance, be interpreted in accordance with the common interpretation within the relevant market sector where appropriate. Otherwise, it shall be interpreted in accordance with the dictionary meaning.

1.3 In this Contract, unless the context otherwise requires:

1.3.1 the singular includes the plural and vice versa;

1.3.2 reference to a gender includes the other gender and the neuter;

1.3.3 references to a person include an individual, company, body corporate, corporation, unincorporated association, firm, partnership or other legal entity or Crown Body;

1.3.4 references to a legal entity (other than the Supplier) shall include unless otherwise expressly stated any statutory successor to such entity and/or the relevant functions of such entity, and references to the Department shall include, where relevant, the ESFA;

1.3.5 a reference to any Law includes a reference to that Law as amended, extended, consolidated or re-enacted from time to time;

1.3.6 any reference to this Contract or to any other document shall include any variation, amendment or supplement to such document;

1.3.7 the words "**including**", "**other**", "**in particular**", "**for example**" and similar words shall not limit the generality of the preceding words and shall be construed as if they were immediately followed by the words "**without limitation**";

1.3.8 references to "**writing**" include typing, printing, lithography, photography, display on a screen, electronic and facsimile transmission and other modes of representing or reproducing words in a visible form, and expressions referring to writing shall be construed accordingly;

1.3.9 references to "**clauses**" and "**Schedules**" are, unless otherwise provided, references to the clauses of and schedules to the Core Terms and references in any Schedule to parts, paragraphs, annexes and tables are, unless otherwise provided, references to the parts, paragraphs, annexes and tables of the Schedule in which these references appear;

1.3.10 references to "**paragraphs**" are, unless otherwise provided, references to the paragraph of the appropriate Schedules unless otherwise provided; and

1.3.11 the headings in this Contract are for ease of reference only and shall not affect the interpretation or construction of this Contract.

2 Definitions

2.1 In this Contract, unless the context otherwise requires, the following words shall have the following meanings:

"**Academic Year**" means 1 August to 31 July in the following calendar year;

"**Additional Service**" means each additional service listed in Schedule 6 (*Pricing Schedule*) and detailed in Annex 10 to the Service Requirements;

"**Affected Party**" means the party seeking to claim relief in respect of a Force Majeure Event;

"**Affiliates**" means in relation to a body corporate, any other entity which directly or indirectly Controls, is Controlled by, or is under direct or indirect common Control of that body corporate from time to time;

"**Ancillary Materials**" means all information and materials (other than Key Materials) to which the Authority and/or a Future Supplier would require access for use for the Portability Purposes, and any other materials which would be required on or to facilitate succession to a Future Supplier in a seamless manner in relation to the TQ offered or Operated by the Supplier. Ancillary Materials shall include, without limitation:

(a) Student results including grades;
(b) statistical analysis for grading (excludes the systems supporting the analysis);
(c) lists of Providers;
(d) marked Student evidence (with moderation outcomes);
(e) documentation which provides an overview or analysis of Student performance (including chief examiner and chief moderator reports), which include but are not limited to, examples of student responses to assessment questions and/or tasks as well as narrative explaining why students did well/ less well on individual items/ components/ subcomponents);
(f) data on Student credits;
g) data on Student appeals;
(h) data on special considerations for Students;
(i) the Assessment Strategy;
(j) Student registrations;
(k) draft materials in preparation for forthcoming assessments;
(l) the Key Dates Schedule (in respect of forthcoming assessments);
(m) lists, with contact details, of people contracted by the Supplier to perform or oversee activities which are necessary for the conduct and quality assurance of assessments for the TQ;
(n) materials from completed assessments, such as completed Students' examination answer booklets; and
(o) TQ Live Assessment Materials.

"**Approval**" means the prior written consent of the Authority and "Approve" and "Approved" shall be construed accordingly;

"Approved Assessment Strategy" shall have the meaning given in Schedule 2 (*Service Requirements*);

"**Approved Initial TQ Deliverables**" means the Initial TQ Deliverables approved by the Authority in accordance with clause 5.13 **(***Developing the TQ and achieving IfATE Approval*) or clause 8.10 or 8.11 (*TQ Changes*) (as the case may be) as such deliverables are reviewed and updated in accordance with this Contract;

"**Approved Provider**" means an Eligible Provider that has been granted Provider Approval in accordance with clause 7.1 (*Interaction with Providers*) and in respect of which such Provider Approval has not been revoked pursuant to clause 7.2 (*Interaction with Providers*);

"Approved Provider's Quality Assurance Process" means the quality assurance process referred to in, and meeting the requirements of, the relevant part of the Product Description for the TQ Specification;

"Approved TQ Specification" means the TQ Specification approved by the Authority in accordance with clause 5.13 (*Developing the TQ and achieving IfATE Approval*) or clause 8.10 or 8.11 (*TQ Changes*) (as the case may be);

"**Assessment Strategy**" means the assessment strategy referred to in, and meeting the requirements of, the Product Description for the Assessment Strategy, which unless otherwise agreed in writing with the Authority must be consistent with the relevant details forming part of the Supplier's Response;

"**Assessors**" means any assessor appointed by the Supplier to assess performance by Students in respect of the TQ Live Assessment Materials;

"Audit" means the Authority's right to:

(a) verify the accuracy of the Charges and any other amounts payable by the Authority (including proposed or actual variations to them in accordance with this Contract);

(b) verify the costs of the Supplier (including the costs of all Subcontractors and any third-party suppliers) in connection with the provision of the Services (including the supply of the Products);

(c) verify the Supplier's and each Subcontractor's compliance with the applicable Law;

(d) identify or investigate actual or suspected breach of clauses 31 to 35, impropriety or accounting mistakes or any breach or threatened breach of security and in these circumstances the Authority shall have no obligation to inform the Supplier of the purpose or objective of its investigations;

(e) verify the Supplier's compliance with Schedule 9 (*Data Handling and Security Management*);

(f) identify or investigate any circumstances which may impact upon the financial stability of the Supplier, and/or their ability to provide the Services including to supply the Products;

(g) obtain such information as is necessary to fulfil the Authority's obligations to supply information for Parliamentary, ministerial, judicial or administrative purposes including the supply of information to the Comptroller and Auditor General;

(h) review any books of account and the internal contract management accounts kept by the Supplier in connection with this Contract;

(i) carry out the Authority's internal and statutory audits and to prepare, examine and/or certify the Authority's annual and interim reports and accounts;

(j) enable the National Audit Office to carry out an examination pursuant to Section 6(1) of the National Audit Act 1983 of the economy, efficiency and effectiveness with which the Authority has used its resources;

(k) verify the accuracy and completeness of any Management Information delivered or required by this Contract; and/or

(l) obtain such information as is necessary to undertake a review and/or assessment of the performance of the whole or any part of the T Levels Programme;

"Auditor" means any, or any combination, of:

(a) the Authority's internal and external auditors;

(b) the Authority's statutory or regulatory auditors;

(c) the Comptroller and Auditor General, its staff and/or any appointed representatives of the National Audit Office;

(d) HM Treasury or the Cabinet Office;

(e) any party formally appointed by the Authority to carry out audit or similar review functions; and

(f) successors or assigns of any of the above;

"Authority Authorised Representative" means the person referred to in Schedule 20 as such or the representative appointed by the Authority from time to time in relation to this Contract as notified in writing (which may, in the case of this specific notification, be by email only) to the Supplier;

"**Authority Procedural Review**" means the Authority's procedural review process as published on the Authority's web site from time to time;

"Awarding Organisation" means a body recognised by Ofqual as a provider of certain qualifications;

"Background IPR" means any IPR owned by a party prior to the Effective Date or created or developed by a party independently of this Contract, but does not include IPR in Key Materials;

"Beneficiary" means a Party having (or claiming to have) the benefit of an indemnity under this Contract;

"Breach of Security" means the occurrence of:

(a) any unauthorised access to or use of the Services and/or the Products, the sites from which the Services are delivered (and/or where the Products are developed, and/or stored) and/or any information and communication technology, information or data (including the Confidential Information and the IfATE Data) used by the Authority and/or the Supplier in connection with this Contract; and/or

(b) the loss and/or unauthorised disclosure of any information or data (including the Confidential Information and the IfATE Data), including any copies of such information or data, used by the Authority and/or the Supplier in connection with this Contract,

in either case as may be more particularly set out in the Security Policy;

"Business Continuity Plan" means the business continuity and disaster recovery plan relating to this Contract, as set out in Schedule 10 (*Business Continuity*);

"Cabinet Office Statement" means the Cabinet Office Statement of Practice – Staff Transfers in the Public Sector 2000 (as revised 2013) as may be amended or replaced;

"Change in Law" means any change in Law which impacts on the provision of the Services (including the supply of the Products) and/or the performance of this Contract which comes into force after the Effective Date;

"Charges" means:

(a) the Development Charge payable to the Supplier by the Authority in accordance with clause 4.1.1 (*Pricing and payments*);

(b) in respect of any Exclusive TQ Change, the amount (exclusive of any applicable VAT) agreed or determined in respect of such Exclusive TQ Change in accordance with clause 8.6 (*TQ Changes*); and

(c) in respect of any other Variation, the amount agreed pursuant to clause 28 (*Changing this Contract*) in respect of such Variation;

"Claim" means any claim for which it appears that a Beneficiary is, or may become, entitled to indemnification under this Contract;

“Cohort” means a group of Students who are registered by an Approved Provider with the Supplier to commence the TQ in the relevant Academic Year;

“Commercially Sensitive Information” means the Confidential Information listed in Schedule 18 (*Commercially Sensitive Information*) comprising of commercially sensitive information relating to the Supplier, its IPR or its business which the Supplier has indicated to the Authority that, if disclosed by the Authority, would cause the Supplier significant commercial disadvantage or material financial loss;

“**Comparable Supply**” means the supply of services to the Authority or another customer or client of the Supplier that are the same as or similar to the Services (including the supply of products that are the same as or similar to the Products) including services relating to qualifications in England outside the T Levels Programme;

“**Conditions of Recognition**” means the conditions of Ofqual Recognition imposed on the Supplier by Ofqual including any general level conditions, qualification level conditions, subject level conditions and special conditions;

“**Confidential Information**” means, subject to clause 19.8 (*What must be kept confidential*), any information, however it is conveyed, that relates to the business, affairs, developments, trade secrets, Know-How, personnel and suppliers of the Authority or the Supplier, including IPRs, together with information derived from the above, and any other information clearly designated as being confidential (whether or not it is marked as “**confidential**”) or which ought reasonably to be considered to be confidential. Confidential Information shall not include Student Related Data;

“**Conflict of Interest**” means a conflict between the financial or personal duties of the Supplier, or the Supplier Staff and the duties owed to the Authority under this Contract, in the reasonable opinion of the Authority. This includes where:

(a) the Supplier’s interests in any activity undertaken by the Supplier, on its behalf, or by an Affiliate of the Supplier have the potential to lead the Supplier to act contrary to the Supplier’s interests in the development, delivery and award of the TQ in accordance with the Conditions of Recognition;

(b) a person who is connected to the development, delivery, or award of the TQ by the Supplier has interests in any other activity which have the potential to lead that person to act contrary to his or her interests in that development, delivery or award in accordance with the Conditions of Recognition, or

(c) an informed and reasonable observer would conclude that either of these situations was the case;

"**Continuing Activities**" means activities of the Supplier under this Contract in relation to the TQ which continue following the end of the second Academic Year for the final Exclusive Cohort, such as retakes, appeals, and ongoing records management;

"**Contract**" means this contract;

"**Contract Month"** means each calendar month, provided that:

(a) the first Contract Month shall commence on and from the Effective Date and shall end on the last day of the calendar month in which the Effective Date occurs; and
(b) the last Contract Month shall commence on and from the first day of the calendar month in which the End Date occurs and shall end on the End Date;

"Contract Period" means the period for which this Contract would remain in force (taking into account any current Extension Period) if not terminated earlier;

"**Control"** means the possession by a person, directly or indirectly, of the power to direct or cause the direction of the management and/or policies of the other person (whether through the ownership of voting shares, by contract or otherwise) and

"**Controlled**" shall be construed accordingly;

"Controller" has the same meaning as in the GDPR;

"Core Terms" means the terms set out in the main body of this Contract;

"Critical Service Failure" means:

(a) the Ofqual Recognition of the Supplier to make the TQ available to Approved Providers for delivery to Students is withdrawn;
(b) a failure by the Supplier to make the Final Submission by the Final Approval Milestone Date or the failure of any Final Submission (or Final Re-Submission) to meet the requirements necessary to achieve IfATE Approval (in each case other than where such failure results from a breach of this Contract by the Authority);
(c) a failure by the Supplier to make a Final Re-Submission within the time period required by clause 5.13.2(*Developing the TQ and achieving IfATE Approval*) (other than where such failure results from a breach of this Contract by the Authority);
(d) the Authority withdraws IfATE Approval (having previously awarded IfATE Approval) in accordance with this Contract;

(e) any failure by the Supplier to perform a Designated Action within the specified timeframe for that Designated Action (other than where such failure results from a breach of this Contract by the Authority);

(f) any Supplier Termination Event which has occurred in respect of the Supplier in its role as an Awarding Organisation for any part of the T Levels Programme outside this Contract;

(g) any Breach of Security which either (i) results in material personal data being lost or compromised or shared without authorisation; or (ii) is not notified to the Authority promptly (and in any event within one Working Day);

(h) the Supplier breaches its obligations relating to the confidentiality of assessment papers (prior to the relevant assessment date) and/or Student results (prior to the relevant publication date); and

(i) any other event, matter or circumstance which is expressed to be (or deemed to be) a Critical Service Failure in this Contract;

"Crown Body" means the government of the United Kingdom (including the Northern Ireland Assembly and Executive Committee, the Scottish Executive and the National Assembly for Wales), including government ministers and government departments and bodies, persons, commissions or agencies from time to time carrying out functions on its behalf;

"Data Protection Legislation" means:

(a) the GDPR;

(b) the Data Protection Act 2018 to the extent that it relates to processing of personal data and privacy; and

(c) all applicable Law about the processing of personal data and privacy;

"Default" means any breach of the obligations of the Supplier (including abandonment of this Contract in breach of its terms) or any other default (including material default), act, omission, negligence or statement of the Supplier, of its Subcontractors or any Supplier Staff howsoever arising in connection with or in relation to the subject-matter of this Contract and in respect of which the Supplier is liable to the Authority;

"Deliverable" means all information and data the Supplier creates, identifies for use, or uses as part of or for the Operation of the TQ, including Products and Management Information;

"Department" means the Secretary of State for Education;

"Designated Action" means an action which the Authority requires the Supplier to take within a specified timeframe to obtain and/or maintain IfATE Approval and/or to ensure ongoing compliance of the Supplier with the terms of this Contract and such action may include:

(a) working in a prescribed way with Authority personnel and/or a third party appointed by the Authority to achieve certain specified performance and/or progress improvements;

(b) taking appropriate remedial actions in the event that any Initial Development Services and/or interim Products provided during the Development Phase are not in line with the trajectory set out in the Implementation and Delivery Plan;

(c) temporarily suspending and/or restricting any elements (in full or part) of the Services (including the supply of any Products);

(d) complying with increased performance monitoring, provision of information and/or increased audit;

(e) complying with any reasonable instructions of the Authority to help to mitigate actual and/or potential risks associated with delivery of the T Levels Programme; and/or

(f) providing reasonable cooperation to other Awarding Organisations and third party suppliers of the Authority appointed in connection with the T Levels Programme;

"Development Charge" means the amount (exclusive of any applicable VAT) referred to as the "Qualification development charge" in Schedule 6 (*Pricing Schedule*);

"Development Phase" – The period between commencement of the Contract and the Approval of the TQ, being the period during which the TQ is developed by the Supplier.

"Development Phase Report" means the report referred to in the second row of the first column in the Table in Annex 9 to the Service Requirements and containing the information set out in the second row of the second column of that Table;

"Devolved Administration" means the government of Scotland, Northern Ireland and/or Wales;

"Disclosing Party" means the Party directly or indirectly providing Confidential Information to the other Party in accordance with clause 19 (*What must be kept confidential*);

"Dispute" means any claim, dispute or difference which arises out of or in connection with this Contract or in connection with the negotiation, existence, legal validity, enforceability or termination of this Contract, whether the alleged liability shall arise under English law or under the law of some other country and regardless of whether a particular cause of action may successfully be brought in the English courts;

“Dispute Resolution Procedure” means the dispute resolution procedure set out in clause 38 (*Resolving disputes*);

“Documentation” means descriptions of the Services (including the Products) and KPIs, technical specifications, user manuals, training manuals, operating manuals, process definitions and procedures, system environment descriptions and all such other documentation (whether in hardcopy or electronic form) that is required to be supplied by the Supplier to the Authority under this Contract as:

(a) would reasonably be required by a competent third party capable of Good Industry Practice contracted by the Authority to develop, configure, build, deploy, run, maintain, upgrade and test the individual systems that are utilised to supply the Services or Products;
(b) is required by the Supplier in order to supply the Services or Products; and/or
(c) has been or shall be generated for the purpose of supplying the Services or Products;

“Early Exit” means any termination of this Contract that occurs prior to the Supplier achieving IfATE Approval;

“Effective Date” means the date on which the last Party to sign has signed this Contract;

“Effective Date of Variation” means the date on which the Variation Form comes into effect.

“EIRs” means the Environmental Information Regulations 2004;

“Eligible Provider” means any Provider referred to in the list referenced in Part 1 of Annex 8 to the Service Requirements in respect of the relevant Cohort, as such list may be updated from time to time by the Authority, or notified in writing to the Supplier in accordance with Part 2 of Annex 8 to the Service Requirements;

“Emergency Exit” means any termination of this Contract other than an Early Exit that is a:

(a) termination of the whole or part of this Contract prior to the Expiry Date (as extended by any Extension Period); or
(b) wrongful termination or repudiation of this Contract by either Party;

“Employee Liability” means all claims, actions, proceedings, orders, demands, complaints, investigations (save for any claims for personal injury which are covered by insurance) and any award, compensation, damages, tribunal awards, fine, loss, order, penalty, disbursement,

payment made by way of settlement and costs, expenses and legal costs reasonably incurred in connection with a claim or investigation including in relation to the following:

(a) redundancy payments including contractual or enhanced redundancy costs, termination costs and notice payments;
(b) unfair, wrongful or constructive dismissal compensation;
(c) a failure to comply with TUPE;
(d) compensation for discrimination on grounds of sex, race, disability, age, religion or belief, gender reassignment, marriage or civil partnership, pregnancy and maternity or sexual orientation or claims for equal pay;
(e) compensation for less favourable treatment of part-time workers or fixed term employees;
(f) outstanding debts and unlawful deduction of wages including any PAYE and National Insurance in relation to payments made by the Authority or the Replacement Supplier to a Transferring Supplier Employee which would have been payable by the Supplier or the Subcontractor if such payment should have been made prior to the Service Transfer Date and also including any payments arising in respect of pensions;
(g) claims whether in tort, contract or statute or otherwise;
(h) any investigation by the Equality and Human Rights Commission or other enforcement, regulatory or supervisory body and of implementing any requirements which may arise from such investigation;

“Employer” means any employer who has or is likely to employ Students who have successfully obtained a T Level qualification;

“Employer and Provider Engagement Strategy” means a clear and detailed strategy detailing the approach to engaging with Employers and Providers in relation to the design, development, delivery, validation and update of the TQ and the Services, including the approach to sharing early and/or amended drafts of the Initial TQ Deliverables and TQ Deliverables with Employers and Providers (as applicable);

"Employer Set Project Grade Exemplar Responses" means actual marked examples of Students' assessment evidence, selected after awarding, as referred to in Service Requirement 5.1, which; meet the requirements for grade A and grade E; are produced (and reviewed each Academic Year) in consultation with Employers; and are accompanied by an explanatory commentary;

"Employer Set Project Guide Exemplar Responses" means indicative guide examples of Students' assessment evidence as referred to in Service Requirement 5.1, which; the Supplier judges would be likely to meet the minimum requirements for grade A and grade E; are produced in consultation with Employers; and are accompanied by an explanatory commentary;

"End Date" means the earlier of:

(a) the Expiry Date (as extended by any Extension Period implemented by the Authority under clause 15 (*Ending or extending this Contract*) or as reduced by the Authority in accordance with clause 14.3.2 (*What may happen if there are issues with your provision of the Services*); or

(b) if this Contract is terminated before the date specified in (a) above, the date of termination of this Contract

"Enhanced Entry Fee" shall have the meaning given in paragraph 2.3 of Schedule 6A (Adaptive Pricing)

"Entry Fee" shall have the meaning as referred to at subsection (a) of the definition of Fees;

"Entry Transition Period" means the period from the Effective Date of this Contract to the End Date of the Authority's Contract with the Former Supplier, eg from the point when the Supplier has been awarded a contract for provision of the TQ, but a contract with the Former Supplier remains in place for existing Students;

"Entry Transition Plan" means the plan produced as part of the Supplier's Tender, and included in Schedule 12 (*Entry and Exit Management*), where relevant, and updated by the Supplier as contemplated by Schedule 4 (*Co-Operation*);

"Environmental Policy" means to conserve energy, water, wood, paper and other resources, reduce waste and phase out the use of ozone depleting substances and minimise the release of greenhouse gases, volatile organic compounds and other substances damaging to health and the environment, including any written environmental policy of the Authority;

"Equality and Human Rights Commission" means the UK Government body named as such as may be renamed or replaced by an equivalent body from time to time;

"ESFA" means the Education and Skills Funding Agency;

"Exclusive Cohort" has the meaning given in clause 2.2 (*Appointment and exclusivity*);

"Exclusive TQ Change" means:

(a) the addition of one or more new Occupational Specialist Component(s) which are to be added to the TQ following the Initial Content Date; and/or

(b) the removal of one or more Occupational Specialist Component(s); and/or

(c) a TQ Change which is requested by the Authority as a result of revision to a relevant Standard arising out of a statutory review of such Standard by the Authority under section A2D3 of the Apprenticeships, Skills, Children and Learning Act 2009;

"**Exemplification Materials"** means the Guide Standard Exemplification Materials and the Grade Standard Exemplification Materials;

"Exit Information" has the meaning given to it in paragraph 3.2 of Schedule 12 (*Exit Management*);

"Exit Plan" means the plan produced and updated by the Supplier during the Term in accordance with paragraphs 1 and 2 of Schedule 12 (*Exit Management*);

"Expiry Date" means 2 years following expiry of the final Academic Year for the final Exclusive Cohort;

"Extension Entry Fee" shall have the meaning given in paragraph 3.1.2 of Schedule 6A (Adaptive Pricing);

"Extension Period" means a period equal to that required to provide the Services (including the supply of any Products) to extend the contract –

(a) for one further Cohort, such period to commence at the start of the Academic Year immediately following the end of the Academic Year in which the fifth Exclusive Cohort commences the TQ; and, at the Authority's discretion,

(b) for a second further Cohort, such period to commence at the start of the Academic Year immediately following the end of the Academic Year in which the sixth Exclusive Cohort commences the TQ; and at the Authority's discretion,

(c) for a third further Cohort, such a period to commence at the start of the Academic Year immediately following the end of the Academic Year in which the seventh Exclusive Cohort commences the TQ.

"Extension Review" shall have the meaning given in paragraph 1.1.2 of Schedule 6A (Adaptive Pricing);

"**Fees**" means:

(a) in respect of the provision of the Provider Services (other than the Additional Services), the amount (exclusive of any applicable VAT) referred to as "Entry fee" in Schedule 6 (*Pricing Schedule*) payable per registered Student to the Supplier by the Approved Providers in accordance with clause 4.1.2 (*Pricing and payments*); and

(b) the Additional Services, the amount (exclusive of any applicable VAT) applicable to the relevant Additional Service as set against that Additional Service in Schedule 6 (*Pricing Schedule*) payable to the Supplier by the Approved Providers in accordance with clause 4.1.2 (*Pricing and payments*);

(c) in each case, as such fees are adjusted in accordance with clauses 4.12 and 4.13 (*Pricing and payments*);

"First Extension" shall have the meaning given in paragraph 3.1 of Schedule 6A (Adaptive Pricing);

"Final Approval Milestone" means the Milestone set out in the third row of the Table in Annex 7 to the Service Requirements;

"Final Approval Milestone Date" means the date set out against the Final Approval Milestone in the second column of the Table at Annex 7 to the Service Requirements;

"Final Milestone Payment" means an amount equal to 30% of the Development Charge;

"Final Re-Submission" means the relevant documentation and/or additional information that the Supplier is required to re-submit in accordance with clause 5.13.2 (*Developing the TQ and achieving IfATE Approval*);

"Final Submission" means the Submission applicable to the Final Approval Milestone;

"Final Updated Projection" shall have the meaning given in paragraph 3.1.1 of Schedule 6A (Adaptive Pricing);

"FOIA" means the Freedom of Information Act 2000 as amended from time to time and any subordinate legislation made under that Act from time to time together with any guidance and/or codes of practice issued by the Information Commissioner or relevant Government department in relation to such legislation;

"Force Majeure Event" means, subject to clause 24.4 (*Circumstances beyond either Party's control*), any event outside the reasonable control of either Party affecting its performance of its obligations under this Contract arising from acts, events, omissions, happenings or non-happenings beyond its reasonable control and which are not attributable to any wilful act,

neglect or failure to take reasonable preventative action by that Party, including acts of God, riots, war or armed conflict, acts of terrorism, acts of government, local government or regulatory bodies, fire, flood, storm or earthquake, or disaster but excluding any industrial dispute relating to the Supplier or the Supplier Staff or any other failure in the Supplier's or a Subcontractor's supply chain;

"Force Majeure Notice" means a written notice served by the Affected Party on the other Party stating that the Affected Party believes that there is a Force Majeure Event;

"Former Supplier" means the Awarding Organisation that is operating or operated the T Level technical education qualification under the Original Contract;

"Former Supplier's TQ" means a technical education qualification forming part of the T Levels Programme which is replaced by the TQ which is the subject of this Contract;

"Former Supplier's TQ Specification" means the Specification of Content, the Scheme of Assessment and the Approved Provider's Quality Assurance Process, designed, developed and delivered by a Former Supplier that meets all of the requirements of the Product Description for the TQ Specification; including any TQ Changes required by the Authority notified to the Former Supplier;

"Future Supplier" means any Awarding Organisation appointed, at any point in the future and including any Replacement Supplier, to operate one or more T Level technical education qualifications by or at the direction of the Authority from time to time, and where the Authority is operating a T Level technical education qualification, shall also include the Authority;

"GDPR" means the General Data Protection Regulation (Regulation (EU) 2016/679);

"General Change in Law" means a Change in Law where the change is of a general legislative nature (including taxation or duties of any sort affecting the Supplier) or which also affects and/or relates to a Comparable Supply;

"Good Industry Practice" means standards, practices, methods and procedures conforming to the Law and the exercise of the degree of skill and care, diligence, prudence and foresight which would reasonably and ordinarily be expected from a skilled and experienced person or body engaged within the relevant industry or business sector;

“Grade Standard Exemplification Materials” means the exemplification materials referred to in, and meeting the requirements of, the relevant part of the Product Description for the Exemplification Materials;

“Guarantee” means a guarantee in the form set out in Schedule 13 (*Form of Guarantee*) in relation to this Contract or any guarantee acceptable to the Authority that replaces it from time to time;

“Guarantor” means [•] of [•], or such other person replacing that person from time to time in accordance with this Contract;

“**Guide Standard Exemplification Materials”** means the exemplification materials referred to in, and meeting the requirements of, the relevant part of the Product Description for the Exemplification Materials and Approved by the Authority;

“IfATE Approval” means approval by the Authority pursuant to section -A2D3 of the Apprenticeships, Skills, Children and Learning Act 2009 for the TQ to be made available to Approved Providers and/or Students based on the TQ meeting the requirements of paragraph 2.1 or 2.3 of Part 1 of the Services Requirements as applicable to the satisfaction of the Authority;

“IfATE Data” means:

(a) the data, text, drawings, diagrams, images or sounds (together with any database made up of any of these) which are embodied in any electronic, magnetic, optical or tangible media, including any of the Authority's Confidential Information, and which:
    (i) are supplied to the Supplier by or on behalf of the Authority; or
    (ii) the Supplier is required to generate, process, store or transmit pursuant to this Contract;
(b) any Personal Data for which the Authority is the Controller; or
(c) Student Related Data;

“**Impact Assessment**” means an assessment of the impact of a Variation request completed in good faith, including:

(a) details of the impact of the proposed Variation on the Services (including the supply of the Products) and the Supplier's ability to meet its other obligations under this Contract;
(b) details of the cost of implementing the proposed Variation;
(c) details of the ongoing costs required by the proposed Variation when implemented, including any increase or decrease in the Charges and/or the Fees (as applicable),

any alteration in the resources and/or expenditure required by either Party and any alteration to the working practices of either Party;

(d) a timetable for the implementation, together with any proposals for the testing of, the Variation; and

(e) such other information as the Authority may reasonably request in (or in response to) the Variation request;

"Implementation and Delivery Plan" means the outline Implementation and Delivery Plan prepared by the Supplier as part of the Supplier's Response for implementation of the Services and supply of the Products (including to meet the Milestones) and which, as at the Effective Date, is set out in Schedule 3 (*Implementatio*n), as such plan is, subject to paragraph 2.5 of Part 1 of the Service Requirements, developed and amended from time to time to fully meet the requirements of the Product Description for the "Implementation and Delivery Plan";

"Inclusive TQ Change" means any TQ Change that is not an Exclusive TQ Change;

"Indemnifier" means a Party from whom an indemnity is sought under this Contract;

"Information Commissioner" means the UK's independent authority which deals with ensuring information relating to rights in the public interest and data privacy for individuals is met, whilst promoting openness by public bodies;

"Initial Content Date" has the meaning given in clause 8.2 (*TQ Changes*);

"**Initial Development Services**" shall have the meaning given in paragraph 2.1 of Part 1 of the Service Requirements;

"Initial Projection" shall have the meaning given in paragraph 2.3 of Schedule 6A (Adaptive Pricing);

"**Initial TQ Deliverables"** means each of:

(a) The TQ Specification;

(b) TQ Specimen Assessment Materials;

(c) the Provider Approval Criteria; and

(d) the Assessment Strategy;

"Insolvency Event" means:

(a) in respect of a company:

(i) a proposal is made for a voluntary arrangement within Part I of the Insolvency Act 1986 or of any other composition scheme or arrangement with, or assignment for the benefit of, its creditors; or

(ii) a shareholders' meeting is convened for the purpose of considering a resolution that it be wound up or a resolution for its winding-up is passed (other than as part of, and exclusively for the purpose of, a bona fide reconstruction or amalgamation); or

(iii) a petition is presented for its winding up (which is not dismissed within fourteen (14) Working Days of its service) or an application is made for the appointment of a provisional liquidator or a creditors' meeting is convened pursuant to section 98 of the Insolvency Act 1986; or

(iv) a receiver, administrative receiver or similar officer is appointed over the whole or any part of its business or assets; or

(v) an application order is made either for the appointment of an administrator or for an administration order, an administrator is appointed, or notice of intention to appoint an administrator is given; or

(vi) it is or becomes insolvent within the meaning of section 123 of the Insolvency Act 1986; or

(vii) being a "small company" within the meaning of section 382(3) of the Companies Act 2006, a moratorium comes into force pursuant to Schedule A1 of the Insolvency Act 1986; or

1. in respect of an individual or partnership, any event analogous to those listed in limbs (a) (i) to (vii) (inclusive) occurs in relation to that individual or partnership; or
2. any event analogous to those listed in limbs (a) (i) to (vii) (inclusive) occurs under the law of any other jurisdiction;

"**Intellectual Property Rights**" or "**IPR**" means:

(a) copyright, rights related to or affording protection similar to copyright, rights in databases, patents and rights in inventions, semi-conductor topography rights, trade marks, rights in internet domain names and website addresses and other rights in trade or business names, goodwill, designs, Know-How, trade secrets and other rights in Confidential Information;

(b) applications for registration, and the right to apply for registration, for any of the rights listed at (a) that are capable of being registered in any country or jurisdiction; and

(c) all other rights having equivalent or similar effect in any country or jurisdiction;

"**Interim Milestone**" means each of the interim Milestones specified in the Table in Annex 7 to the Service Requirements;

"**Interim Milestone Payment**" means:

(a) in respect of Interim Milestone 1, an amount equal to 30% of the Development Charge;

(b) in respect of the Interim Milestone 2, an amount equal to 40% of the Development Charge;

"IPR Claim" means any claim of infringement or alleged infringement (including the defence of such infringement or alleged infringement) of any IPR, used to provide the Services and/or supply the Products or otherwise provided and/or licensed by the Supplier (or to which the Supplier has provided access) to the Authority in the fulfilment of its obligations under this Contract;

"**Issues Log**" means the issues log referred to in, and meeting the requirements of, the Product Description for the Issues Log;

"**Key Dates Schedule**" means a schedule of key dates in relation to the roll-out and operation of the TQ and other technical education qualifications across the T Levels Programme including registration dates and deadlines, assessment dates, and dates for publication of results, which is based on the indicative key dates schedule in Annex 5 to the Service Requirements and is agreed in relation to the T Levels Programme between Awarding Organisations pursuant to Schedule 4 (*Co-operation*) and Approved by the Authority;

"**Key Materials**" means materials the IPR in which the Authority reasonably requires ownership of for the Portability Purposes. Examples of where the Authority may reasonably require ownership of the IPR include because the Authority or a Future Supplier (or, where relevant, a potential Future Supplier) may need to copy or otherwise reproduce such materials (in whole or in part), to supply or communicate the same, or to be able control the use (in whole or in part) of such materials by third parties, or to authorise others to do so.

Key Materials shall include:

(a) specifications of content for each TQ including core and all specialist components;

(b) assessment guidelines (for Providers);

(c) quality assurance requirements (for Providers);

(d) specimen assessment materials;

(e) standards exemplification materials;

(f) supplementary specimen assessment materials

(g) employer set project guide exemplar responses

(h) employer set project grade exemplar responses

(i) updates or redevelopments of specifications of content;

(j) updates and redevelopments of any Key Materials; and

(k) any materials equivalent to the above to which a Skilled Future Supplier would reasonably require access for the Portability Purposes.

Key Materials shall not include:

1. Support Materials, insofar as they are not part of any of the expressly included items listed above;
2. question banks, insofar as they are not part of any of the expressly included items listed above and are not developed for the TQ; and
3. any systems and platforms used to support the delivery of the TQ, provided that the relevant TQ content or data held in or processed by such systems and/or platforms can be extracted without requiring further processing post-extraction (and the Supplier can demonstrate that they can be so extracted) to enable use of the relevant content and/or data by a Skilled Future Supplier in conjunction with a non-proprietary or generally commercially available system or platform;

"Key Personnel" means the individuals identified as such in the Annex to Schedule 7 (*Staff (including Key Personnel*)) as at the Effective Date or as amended from time to time in accordance with paragraph 1.2 of Schedule 7 (*Staff (including Key Personnel)*);

"Key Roles" means the roles stated in the Annex to Schedule 7 (*Staff (including Key Personnel*)) as at the Effective Date or as amended from time to time in accordance with paragraph 1.2 of Schedule 7 (*Staff (including Key Personnel)*);

"Key Sub-Contract" means each Sub-Contract with a Key Subcontractor;

"Key Subcontractor" means any Subcontractor:

a. which is relied upon to deliver any material part of the Services (including to supply any Products); and/or
b. which, in the opinion of the Authority performs (or would perform if appointed) a critical role in the provision of all or any part of the Services (including the supply of any Products),

and which, as at the Effective Date, are listed in Annex 1 to Schedule 8 (*Supply Chain (including approved Subcontractors)*);

"Know-How" means all ideas, concepts, schemes, information, knowledge, techniques, methodology, and anything else in the nature of know-how relating to the Services and/or the Products;

"**KPI**" means a key performance indicator applicable to the provision of the Services (including the supply of the Products), as set out in the first column of the Table attached at Annex 1 to Schedule 15 (*Monitoring of Performance*);

"**KPI Improvement Plan"** shall have the meaning given in paragraph 2.2 of Schedule 15 (*Monitoring of Performance*);

"Law" means any law, subordinate legislation within the meaning of Section 21(1) of the Interpretation Act 1978, bye-law, enforceable right within the meaning of Section 2 of the European Communities Act 1972, regulation, order, regulatory policy, mandatory guidance or code of practice, judgment of a relevant court of law, or directives or requirements with which the Supplier is bound to comply;

"Losses" means all losses, liabilities, damages, costs, expenses (including reasonable legal fees), disbursements, costs of investigation, litigation, settlement, judgment, interest and penalties whether arising in contract, tort (including negligence), breach of statutory duty, misrepresentation or otherwise and "**Loss**" shall be interpreted accordingly;

"Management Information" means the management information to be delivered to the Authority by the Supplier, as set out or referred to in Annex 9 to the Service Requirements;

"Mid-term Review" shall have the meaning given in paragraph 1.1.1 of Schedule 6A (Adaptive Pricing);

"Milestone" means an event or task to be performed as part of the provision of the Services (and/or the supply of the Products) by a specific date as described in the first column of the Table in Annex 7 to the Service Requirements;

"Moderation" means the Supplier assessment process designed to ensure that, where Approved Provider marking is undertaken in accordance with the Approved Assessment Strategy, such marking is scrutinised by a Moderator to ensure that it is in line with expected standards and Students' marks are adjusted where necessary, and

"**Moderate**" will be construed accordingly;

“Moderator” means a moderator, external to the Approved Provider, employed or engaged by the Supplier to moderate marking undertaken by assessors employed or engaged by the Approved Provider of Students’ performance in respect of the TQ Live Assessment Materials;

“Month” means a calendar month and “**Monthly**” shall be interpreted accordingly;

“National Insurance” means contributions required by the National Insurance Contributions Regulations 2012 (SI 2012/1868) made under section 132A of the Social Security Administration Act 1992;

“Notified Sub-contractor” means a Sub-contractor to whom Transferring Former Supplier Employees will transfer on a Relevant Transfer Date;

“**Occupation**” means a set of jobs where the main tasks and duties are characterised by a high degree of similarity, where a “job” is a role connected to a specific employment contract in a workplace;

“**Occupational Map”** means, for each Route, a map which groups Occupations according to where there is a requirement for shared technical knowledge, skills, and behaviours, and identifies the Occupations for which Standards exist;

“**Occupational Standard**” means the description of the Occupation and the outcomes (knowledge, skills and behaviours) which a Student will be expected to attain to successfully achieve competence in that Occupation, as approved and published by the Authority;

“**Occupational Specialist Component**” means each occupational specialist component of the TQ as referred to in the Former Supplier’s TQ Specification and/or if relevant, the Outline Content;

“**Ofqual”** means the Office of Qualifications and Examinations Regulation, a statutory body created under the Apprenticeships, Skills, Children and Learning Act 2009, as amended by the Education Act 2011, to regulate qualifications, examinations and assessments in England;

“Ofqual Recognition” means recognition of the Supplier by Ofqual in respect of the TQ under section 132 of the Apprenticeships, Skills, Children and Learning Act 2009;

“**Ongoing Development Services”** shall have the meaning given in paragraph 2.3 of Part 1 of the Service Requirements;

“Operate” in relation to a qualification means to provide the Services or a material part of the Services, or services replacing the Services or a material part of the Services, or of an

equivalent character to the Services or a material part of the Services in relation to any other qualification (whether a TQ or not); and "Operation" and other cognate terms shall have a corresponding meaning;

"Operational Delivery Report" means the report referred to in the third row of the first column in the Table in Annex 9 to the Service Requirements and containing the information set out in the third row of the second column of that Table;

"**Ordinary Exit**" means any termination of this Contract (other than an Early Exit) that occurs as a result of the expiry of the Contract on the Expiry Date (as extended by any Extension Period);

"Original Contract" means the contract entered into between the Authority and the Former Supplier for the provision of Services (including the supply of any Products) for the TQ prior to the Effective Date of this Contract and remains in place until the end of the Entry Transition Period;

"Outline Content" means the outline content developed for the TQ by the Authority;

"Parliament" takes its natural meaning as interpreted by Law;

"Party" means the Authority, or the Supplier and "**Parties**" means both of them where the context permits;

"Pathway" means a sub-set of a Route, which groups common sets of Occupations into a number of occupational clusters together;

"**Performance Monitoring Methodology**" means the required evidence and measurement methodology that is to be applied by the Supplier to assess its performance of the relevant part of the Services (including the supply of any Products) to which the KPI in question relates, as such evidence and measurement methodology are set out in the fifth and sixth columns (respectively) of the Table attached at Annex 1 to Schedule 15 (*Monitoring of Performance*);

"**Performance Monitoring Period**" means the period set out against the relevant KPI in the fourth column of the Table attached at Annex 1 to Schedule 15 (*Monitoring of Performance*);

"**Performance Review Meeting"** shall have the meaning given in paragraph 3.2 of Schedule 15 (*Monitoring of Performance*);

"Personal Data" means "personal data" (as defined in the GDPR) that are processed under this Contract;

"**Portability Purposes"** means in order:

a) to secure a smooth transition to a Skilled Future Supplier;
b) to enable the Authority to procure a Skilled Future Supplier (including inviting competition and/or tenders), and for a potential Skilled Future Supplier to compete openly and effectively in any future competition or tender for, delivery and/or Operation of the TQ currently delivered by the Supplier and/or a Replacement TQ;
c) to enable a Skilled Future Supplier to deliver and/or Operate the TQ and/or a Replacement TQ; to enable the Authority and/or any Skilled Future Supplier to carry out or have carried out any Continuing Activities, and/or
d) to enable a Skilled Future Supplier to supply, to Providers, the TQ and/or Replacement TQ and sufficient information and materials (including Support Materials) for Providers to deliver the TQ in a Transparent manner;

"Post-Results Services" means the Services described in and/or provided pursuant to paragraph 9 of Part 1 of the Service Requirements, including the Additional Services;

"**Pre-Delivery Phase**" means the period between the Approval of the TQ and the first teaching of the TQ by Providers, being the period during which Supplier and Providers prepare for delivery;

"Prescribed Person" means a legal adviser, an MP or an appropriate body which a whistle-blower may make a disclosure to as detailed in 'Whistleblowing: list of prescribed people and bodies', 5 October 2019, available online at: https://www.gov.uk/government/publications/blowing-the-whistle-list-of-prescribed-people-and-bodies--2/whistleblowing-list-of-prescribed-people-and-bodies;

"Processor" has the same meaning as in the GDPR and "**Processing**" and "**Processed**" shall be interpreted accordingly;

"**Product**" means each product listed in the first column of the Table in Part 3 of the Service Requirements;

"**Product Description"** means the description of the Authority's minimum requirement for the relevant Product set out in the second column of the Table in Part 3 of the Service Requirements, together with such further information, data and/or content as should reasonably be expected by the Supplier having regard to the Authority's requirements under this Contract and the Supplier's obligations under clause 3.1 (*How the Services must be supplied*);

"Prohibited Acts" means:

(a) to directly or indirectly offer, promise or give any person working for or engaged by the Authority or any other public body a financial or other advantage to:

(i) induce that person to perform improperly a relevant function or activity; or

(ii) reward that person for improper performance of a relevant function or activity;

(b) to directly or indirectly request, agree to receive or accept any financial or other advantage as an inducement or a reward for improper performance of a relevant function or activity in connection with this Contract; or

(c) committing any offence:

(i) under the Bribery Act 2010 (or any legislation repealed or revoked by such Act); or

(ii) under legislation or common law concerning fraudulent acts; or

(iii) defrauding, attempting to defraud or conspiring to defraud the Authority or other public body; or

(d) any activity, practice or conduct which would constitute one of the offences listed under (c) above if such activity, practice or conduct had been carried out in the UK;

"Provider" means an organisation that has a grant agreement and/or a contract in place with the ESFA to provide qualifications to Students or that provides such services on a privately funded basis;

"Provider Approval" means approval of the Eligible Provider in accordance with clause 7.1 (*Interaction with Providers*);

"Provider Approval Criteria" means the approval criteria referred to in, and meeting the requirements of, the Product Description for the Provider Approval Criteria;

"Provider Contract" means a contract between an Approved Provider and the Supplier in respect of the TQ meeting the requirements set out in Schedule 17 (*Provider Contract requirements*);

"Provider Services" means the Services, other than the Initial Development Services and the Ongoing Development Services;

"Rate Card" means the Supplier's rate card as set out in Schedule 6 (*Pricing Schedule*)*;*

"Reasonable Adjustments" shall have the meaning given in SR 2.4 of Service Requirement 2 (as defined in the Service Requirements);

"Recipient Party" means the Party which receives or obtains directly or indirectly Confidential Information;

"Reduced Entry Fee" shall have the meaning given in paragraph 2.4 of Schedule 6A (Adaptive Pricing);

"Reduced Extension Entry Fee" shall have the meaning given in paragraph 3.3 of Schedule 6A (Adaptive Pricing);

"Regulated" means the regulation by Ofqual of a qualification which has been Accredited and "**Regulation**" shall be authorised accordingly;

"Regulations" means the Concession Contracts Regulations 2016;

"Relevant Competence" means being a reasonably skilled and competent Awarding Organisation with access to appropriate tools, systems and platforms to operate technical qualifications;

"Relevant Employees" means those employees whose contracts of employment transfer with effect from the Relevant Transfer Date to the Authority or a Replacement Supplier by virtue of the application of TUPE;

"Relevant Requirements" means all applicable Law relating to bribery, corruption and fraud, including the Bribery Act 2010 and any guidance issued by the Secretary of State for Justice pursuant to section 9 of the Bribery Act 2010;

"Relevant Transfer" means a transfer of employment to which TUPE applies;

"Relevant Transfer Date" means in relation to a Relevant Transfer, the date upon which the Relevant Transfer takes place;

"Reminder Notice" means a written notice sent in accordance with clause 4.8 (*Pricing and payments*) given by the Supplier to the Authority providing notification that payment has not

been received on time, which must be addressed to the Authority Authorised Representative, must set out the sum due, must reference this Contract and clause 4 (*Pricing and payments*) and attach a copy of the relevant valid invoice;

"Replacement Subcontractor" means a Subcontractor of the Replacement Supplier to whom Transferring Supplier Employees will transfer on a Service Transfer Date (or any Subcontractor of any such Subcontractor);

"Replacement Services" means any services (including the supply of products) which are the same as or substantially similar to any of the Services and which the Authority receives in substitution for any of the Services following the expiry or termination or Partial Termination of this Contract, whether those services are provided by the Authority internally and/or by any third party;

"Replacement Supplier" means any third party provider of Replacement Services appointed by or at the direction of the Authority from time to time, or where the Authority is providing Replacement Services on its own account, shall also include the Authority;

"Replacement TQ" means a technical education qualification forming part of the T Levels Programme to replace either: (i) the TQ which is the subject of this Contract; or (ii) the equivalent technical qualification which is the subject of a contract with a Future Supplier;

"Request for Information" means a request for information or an apparent request for information relating to this Contract or an apparent request for such information under the FOIA or the EIRs;

"Required Insurances" means the insurances that must be held by the Supplier as required by the Authority meeting the requirements set out in Schedule 19 (*Required Insurances*);

"Resource Plan" means the Resource Plan prepared by the Supplier as part of the Supplier's Response in relation to the Supplier Staff that shall be utilised (and the manner in which such Supplier Staff shall be utilised) by the Supplier in the performance of the Services and which, as at the Effective Date, is set out in Schedule 3 (*Implementatio*n), as such plan is, subject to paragraph 2.5 of Part 1 of the Service Requirements, developed and amended from time to time to fully meet the requirements of the Product Description for the "Resource Plan";

"Re-Submission" shall have the meaning given in clause 5.11.2(i) (*Developing the TQ and achieving IfATE Approval*);

"**Risk Register"** means the risk register referred to in, and meeting the requirements of, the Product Description for the Risk Register;

"Route" means the broadest category of Occupations in an Occupational Map, typically covering an industrial area;

"Route Panel" means the Authority's panel responsible for managing the development of the TQ Specification, details of which can be found at: https://www.gov.uk/government/publications/t-level-panels-membership;

"**Scheme of Assessment"** means the scheme of assessment referred to in, and meeting the requirements of, the relevant part of the Product Description for the TQ Specification;

"Security Policy" means the Authority's security policy, in force as at the Effective Date (a copy of which has been supplied to the Supplier), as updated from time to time and notified to the Supplier;

"Serious Fraud Office" means the UK Government body named as such as may be renamed or replaced by an equivalent body from time to time;

"Services" means the services as described in the Service Requirements (including the Additional Services);

"**Service Failure"** shall have the meaning given in paragraph 2.2 of Schedule 15 (*Monitoring of Performance*);

"Service Requirements" means the Authority's requirements for the Services (including the supply of the Products) as set out in Schedule 2 (*Service Requirements*);

"Service Transfer" means any transfer of the Services (or any part of the Services), for whatever reason, from the Supplier or any Subcontractor to a Replacement Supplier or a Replacement Subcontractor;

"Service Transfer Date" means the date of a Service Transfer;

"Skilled Future Supplier" means a Future Supplier with Relevant Competence;

"Social Value" means the additional social benefits that can be achieved in the delivery of the Contract, set out in the Supplier's Response and/or Supplier's Tender;

“Special Consideration” shall have the meaning given in SR 2.5 of Service Requirement 2 (as defined in the Service Requirements);

“Specific Change in Law” means a Change in Law that relates specifically to the business of the Authority and which would not affect a Comparable Supply where the effect of that Specific Change in Law on the Services and/or the Products and/or the performance of this Contract is not reasonably foreseeable at the Effective Date. Any change in any Condition of Recognition shall not be a Specific Change in Law;

“**Specification of Content”** means the specification of the content referred to in, and meeting the requirements of, the relevant part of the Product Description for the TQ Specification;

“Staffing Information” means in relation to all persons identified on the Supplier's Provisional Supplier Personnel List or Supplier's Final Supplier Personnel List, as the case may be, such information as the Authority may reasonably request (subject to all applicable provisions of the Data Protection Legislation), but including in an anonymised format:

(a) their ages, dates of commencement of employment or engagement, gender and place of work;
(b) details of whether they are employed, self-employed contractors or consultants, agency workers or otherwise;
(c) the identity of the employer or relevant contracting Party;
(d) their relevant contractual notice periods and any other terms relating to termination of employment, including redundancy procedures, and redundancy payments;
(e) their wages, salaries, bonuses and profit sharing arrangements as applicable;
(f) details of other employment-related benefits, including (without limitation) medical insurance, life assurance, pension or other retirement benefit schemes, share option schemes and company car schedules applicable to them;
(g) any outstanding or potential contractual, statutory or other liabilities in respect of such individuals (including in respect of personal injury claims);
(h) details of any such individuals on long term sickness absence, parental leave, maternity leave or other authorised long term absence;
(i) copies of all relevant documents and materials relating to such information, including copies of relevant contracts of employment (or relevant standard contracts if applied generally in respect of such employees); and
(j) any other Employee Liability Information” as such term is defined in regulation 11 of TUPE;

“Stakeholders” means the Authority, the Department, ESFA, Ofqual, Providers, Employers and members of the Route Panels;

“Standards” means the Occupational Standards, consisting of a description of the Occupation and the outcomes (knowledge, skills and behaviours) which a Student will be expected to attain to successfully achieve competence in that Occupation, as approved and published by the Authority;

“Storage Media” means the part of any device that is capable of storing and retrieving data;

“Student” means an individual undertaking (or who wishes to undertake) a formal programme of study with an Approved Provider for the T Level of which the TQ forms part;

“Student Information” means information or data relating to an individual Student whether or not the Student can be identified from that information or data;

“Student Related Data” means any information or data relating to Students (including any Student Information) and/or any Provider which is generated and/or acquired by and/or otherwise comes into the possession of the Supplier and/or any Supplier Staff as a result of the performance of the Supplier’s obligations under this Contract;

“Sub-Contract” means any contract or agreement (or proposed contract or agreement), pursuant to which a third party:

(a) provides the Services and/or supplies any Products (or any part of them) and/or performs the whole or any part of this Contract;
(b) provides facilities or services necessary for the provision of the Services and/or the supply of any Products (or any part of them) and/or the performs the whole or any part of this Contract; and/or
(c) is responsible for the management, direction or control of the provision of the Services and/or supply of any Products (or any part of them) and/or the performance of the whole or any part of this Contract;

“Subcontractor” means any person other than the Supplier (and/or an Assessor who is self-employed or who provides services to the Supplier through that Assessor’s own personal service company), who is a party to a Sub-Contract and the servants or agents of that person;

“Submission” means, in respect of the relevant Milestone, the Products set out against that Milestone in the third column of the Table in Annex 7 to the Service Requirements;

“Submission Date” means, in respect of the relevant Milestone, the date set out against that Milestone in the second column of the Table in Annex 7 to the Service Requirements;

“Submission Issues Log” means the issues log referred to in, and meeting the requirements of, the Product Description for the Submission Issues Log;

“Subsequent Transfer” has the meaning given in paragraph 8.1 of Schedule 12 (*Exit Management*);

"Supplementary Specimen Assessment Materials" means a full suite of sample questions and tasks for the Core Component and Occupational Specialist Component(s) (in addition to the TQ Specimen Assessment Materials), as referred to in Service Requirement 5.1.

“**Supplier Authorised Representative”** means the person referred to in Schedule 20 as such or the representative appointed by the Supplier from time to time in relation to this Contract as notified in writing (which may, in the case of this specific notification, be by email only) to the Authority;

“Supplier Personnel” means all employees of the Supplier (and any subcontractor) who are wholly or mainly engaged in or assigned to the provision of the Services or any relevant part of the Services including the development of the Products;

“Supplier Staff” means all directors, officers, employees, agents, consultants and contractors of the Supplier (including any Assessor who is self-employed or who provides services to the Supplier through that Assessor’s own personal service company), any Subcontractor engaged in the performance of the Supplier's obligations under this Contract and any company or organisation noted in the Supplier’s Tender as forming part of the consortium which submitted the Supplier’s Tender (“**Consortium Member**”) and all directors, officers, employees, agents, consultants and contractors of any such Subcontractor and/or any such Consortium Member engaged in the performance of the Supplier's obligations under this Contract;

“Supplier's Final Supplier Personnel List” means a list provided by the Supplier of all Supplier Personnel whose will transfer under TUPE on the Service Transfer Date;

“Supplier’s Provisional Supplier Personnel List” means a list prepared and updated by the Supplier of all Supplier Personnel who are at the date of the list wholly or mainly engaged in or assigned to the provision of the Services or any relevant part of the Services which it is envisaged as at the date of such list will no longer be provided by the Supplier;

"Supplier's Response" means that part of the Supplier's Tender (including any method statements) which is at Schedule 5 (*Supplier's Response*);

"Supplier's Tender" means the Supplier's selection questionnaire and tender responses submitted in response to the Authority's advertisement in the Find a Tender Service (as referred to in the Recitals to this Contract) for a provider of the Services and supplier of the Products, as clarified in writing by the Supplier to the Authority prior to the date of this Contract in response to any request for clarification issued by the Authority;

"Supplier Termination Event" means:

(a) the Supplier (i) commits a material Default which is irremediable; or (ii) commits a material Default which is capable of remedy, but which has not been remedied by the Supplier within 30 days of being notified in writing to do so by the Authority;

(b) a Conflict of Interest arises in connection with the delivery of the Services (and/or the supply of the Products) to which no mitigation acceptable to the Authority can be promptly identified;

(c) where a right of termination is expressly reserved in this Contract;

(d) the Supplier is in material Default in respect of any data handling and/or security requirements set out in clauses 13, 18, 19 or Schedule 9 (*Data Handling and Security Management*) (where applicable);

(e) an Insolvency Event occurring in respect of the Supplier;

(f) a change of Control of the Supplier unless:

(i) the Authority has given its prior written consent (not to be unreasonably withheld or conditioned) to the particular change of Control, which subsequently takes place as proposed; or

(ii) the Authority has not served its notice of objection within 6 months of the later of the date on which the change of Control took place or the date on which the Authority was given notice of the change of Control;

(g) a material failure by the Supplier to comply with legal obligations in the fields of environmental, social or labour law;

(h) the departure from the Supplier of any of its senior officers or Key Personnel where the Authority has reasonable grounds to believe that such departure will impact or could potentially impact the delivery of the Services and/or the supply of any Products unless the Authority has not served its notice of objection within 6 months of the date on which the Authority was informed by the Supplier of such departure;

(i) the Supplier assigns, transfers or otherwise disposes of its rights, obligations and/or liabilities or seeks to assign, transfer or otherwise dispose of its rights, obligations

and/or liabilities under the whole or any part of this Contract to a third party in breach of the terms of this Contract (including in breach of the requirements of paragraph 1 of Schedule 8 (*Supply Chain (including approved Subcontractors)*);

(j) the Supplier is in Default under clause 31.1 (*Preventing Fraud, Bribery and Corruption*);

(k) the Supplier provided incorrect or misleading information as part of the Supplier's Tender;

(l) the Supplier or any Subcontractor or Affiliate through its act or omission brings the Authority, the Department and/or the ESFA and/or the T Levels Programme into disrepute and/or diminishes the trust the public places in the Authority, the Department and/or the ESFA;

(m) Not used

(n) an occurrence of any of the circumstances in regulations 44(1) (a) to (c) of the Regulations;

(o) this Contract has been substantially modified in breach of regulation 43(10) of the Regulations;

(p) the Authority discovers that the Supplier was in one of the situations in regulations 38(8) to 38(10) of the Regulations at the time this Contract was awarded;

(q) the Court of Justice of the European Union uses Article 258 of the Treaty on the Functioning of the European Union ("**TFEU**") to declare that this Contract should not have been awarded to the Supplier because of a serious breach of the TFEU or the Regulations;

(r) a Critical Service Failure occurs; or

(s) the Supplier fails to comply with clause 35.2 (*Tax*) or fails to provide details of steps being taken and mitigating factors pursuant to clause 35.2 (*Tax*) which in the reasonable opinion of the Authority are acceptable;

"**Support Materials**" means teaching support materials intended for a Provider or Student audience, such as textbooks, and any other materials which the Authority agrees in writing to be Support Materials;

"**Target Service Level**" means the target performance level set out against the relevant KPI in the third column of the Table attached at Annex 1 to Schedule 15 (*Monitoring of Performance*);

"Technical Qualifications Explanatory Note" means an explanation of TQs, their purpose and how they are delivered;

"Term" means the period commencing on the Effective Date and ending on the End Date;

"Termination Notice" means a written notice of termination given by one Party to the other, notifying the Party receiving the notice of the intention of the Party giving the notice to terminate this Contract on a specified date and setting out the grounds for termination;

"Third Party" means any supplier of services fundamentally the same as the Services (either in whole or in part) immediately before the Effective Date;

"Third Party IPR" means Intellectual Property Rights owned by a third party which is or will be used by the Supplier for the purpose of providing the Services and/or supplying the Products;

"Transferring Former Supplier Employees" means those employees of the Former Supplier to whom TUPE will apply on a Relevant Transfer Date;

"TQ" means the technical education qualification element of the T Level in respect of the Pathway that is (amongst other things) designed, developed and delivered under this Contract;

"TQ Assignment and Licence" means the assignment and licence in respect of certain Intellectual Property Rights in relation to the TQ in the form set out in Schedule 14 (*Form of Assignment and Licence*);

"TQ Change" means any change or variation to the content of the TQ;

"**TQ Content Updating Schedule**" means the schedule of dates set out in Annex 6 to the Service Requirements (or such other dates as may be agreed by the Authority from time to time) applicable to the relevant Inclusive TQ Change or Exclusive TQ Change (as the case may be);

"**TQ Core Component**" means the core component of the TQ referred to in the Former Supplier's TQ Specification and/or if relevant, the Outline Content;

"**TQ Deliverables"** means:

(a) in the period prior to the Supplier making available the Grade Standard Exemplification Materials referred to in paragraph 6.2.2 of Part 1 of the Service Requirements, the Approved Initial TQ Deliverables and the Approved Guide Standard Exemplification Materials; and

(b) in the period following the Supplier making available the Grade Standard Exemplification Materials referred to in paragraph 6.2.2 of Part 1 of the Service Requirements:

(i) the Approved Initial TQ Deliverables; and

(ii) the Grade Standard Exemplification Materials,

in each case, as amended in accordance with this Contract;

"TQ Development Meeting" shall have the meaning given in clause 5.4 (*Developing the TQ and achieving IfATE Approval*);

"TQ Live Assessment Materials" shall have the meaning given in Schedule 2 (*Service Requirements*);

"TQ Specification" means the Specification of Content, the Scheme of Assessment and the Approved Provider's Quality Assurance Process;

"TQ Specimen Assessment Materials" means the specimen assessment materials referred to in, and meeting the requirements of, the Product Description for the TQ Specimen Assessment Materials;

"T Level" means the technical study programme known as a "T Level";

"T Level Awarding Organisations" shall have the meaning given in paragraph 1.1 of Schedule 4 (*Co-operation*);

"T Level Branding Guidelines" means the Authority's written guidelines prescribing the permitted form and manner in which the trade marks (the "*Mark*" as defined within the T Level Trade Mark Licence) may be used and setting out how the Supplier branding may be used in relation to materials used in the operation of the TQ or to promote the TQ, a copy of which is set out in the document entitled T Level Branding Guidelines, including any amendments or additions notified by the Authority to the Supplier from time to time, provided that the Authority shall where possible provide reasonable notice in writing to the Supplier of any proposed amendments or additions to such guidelines;

"**T Level Panel"** means the group of Employers, professionals and practitioners appointed to advise on the content of the T Level of which the TQ forms part;

"T Level Trade Mark Licence" means the trade mark licence granted pursuant to Schedule 16 (*Logos and Trademarks – T Level Trade Mark Licence*);

"T Levels Programme" means the programme of technical education in England managed by the Authority and known as "T Levels";

“Transferable Contracts” means Sub-Contracts, or other agreements which are necessary to enable the Authority or any Replacement Supplier to provide the Services and/or develop, maintain or supply the Products or the Replacement Services, including all relevant Documentation;

“Transferring Supplier Employee” means those employees whose contract of employment will be transferred to the Authority or a Replacement Supplier pursuant to TUPE on expiry or termination of this Contract;

“Transition Period” means the period from a Replacement Supplier or Future Supplier commencing any aspects of development or delivery of the TQ to the End Date, e.g. from the point when the Replacement Supplier or Future Supplier has been awarded a contract for provision of the TQ, but while this Contract remains in place for existing Students;

“Transparency Information” has the meaning given to it in clause 20 (*When information can be shared);*

“Transparency Reports” means: (i) the Management Information relating to the Services and performance of this Contract which the Supplier is required to provide to the Authority in accordance with the reporting requirements set out in the Service Requirements; and (ii) the output of any survey commissioned by the Authority in connection with the performance of the Supplier under this Contract;

“Transparent” means that Students and Employers will regard the TQ delivered by a Future Supplier as materially the same as the TQ delivered and operated by the (existing) Supplier;

“TUPE” means the Transfer of Undertakings (Protection of Employment) Regulations 2006 (2006/246) and/or any other regulations or other legislation enacted for the purpose of implementing or transposing the Acquired Rights Directive (77/187/EEC, as amended by Directive 98/50 EC and consolidated in 2001/23/EC) into English law;

“TUPE Information” has the meaning given in paragraph 8.5 of Schedule 12 (*Exit Management*);

“Updated Projection” shall have the meaning given in paragraph 2.1 of Schedule 6A (Adaptive Pricing);

“Variation” means any variation or change to this Contract which is not an Inclusive TQ Change;

“Variation Form” means the form set out in Schedule 11 (*Change Management*);

“VAT” means value added tax in accordance with the provisions of the Value Added Tax Act 1994; and

“Working Day” means any day other than a Saturday or Sunday or public holiday in England and Wales.

Schedule 2

Service Requirements

The content for this Schedule is as below:

1. **Service Requirements**
2. **GEN2 W2 Science TQ Spec**

Schedule 2

Service Requirements

Schedule 2

Service Requirements

Definitions

In this Service Requirements, the following terms shall have the following meanings:

"**Appeal**" shall have the meaning given in SR 8.2 in Service Requirement 8;

"**Approved Assessment Strategy**" means the Assessment Strategy approved by the Authority in accordance with clause 5.13 (*Developing the TQ and achieving IfATE Approval*) or clause 8 (*TQ Changes*) (as the case may be), subject to paragraph 2.6 of Part 1 of the Service Requirements, as amended from time to time in accordance with this Contract;

"**Approved Guide Standard Exemplification Materials**" means the Guide Standard Exemplification Materials approved by the Authority in accordance with clause 5.13 (*Developing the TQ and achieving IfATE Approval*) subject to paragraph 2.6 of Part 1 of the Service Requirements, as amended from time to time in accordance with this Contract;

"**Component**" means the TQ Core Component or any Occupational Specialist Component (as the case may be) and "**Components**" shall mean both or all of them (as the context may require);

"**Employer Set Project"** means a project set collaboratively between the Supplier and Employers, as more particularly referred to in Service Requirement 2;

"**External Examination"** means each assessment by examination which is:

(a) set by the Supplier;

(b) designed to be taken simultaneously by all Students taking the relevant assessment at a time (subject to compliance with the requirements of the Key Dates Schedule for the relevant Academic Year) determined by the Supplier;

(c) taken under conditions specified by the Supplier (including conditions relating to the supervision of Students taking the relevant assessment and the duration of the assessment); and

(d) marked by the Supplier.

"**First Teach Cohort**" means the first group of Students to be assessed on the TQ;

"**Guided Learning**" means the activity of a Student being taught or instructed by, or otherwise participating in education or training under the immediate guidance or supervision of a lecturer, supervisor, tutor or other appropriate provider of education or training. For these purposes the activity of 'participating in education or training' shall be treated as including the activity of being assessed if the assessment takes place under the immediate guidance or supervision of a lecturer, supervisor, tutor or other appropriate provider of education or training;

"**Occupational Entry Competence**" means that level of competence that:

(a) signifies that a Student is well-placed to develop full occupational competence, with further support and development, once in employment;

(b) is as close to full occupational competence as can be reasonably expected of a Student studying the TQ in a classroom-based setting (e.g. in the classroom, workshops simulated working and (where appropriate) supervised working environments); and

(c) signifies that a Student has achieved the level for a pass in relation to the relevant Occupational Specialist Component;

"**Qualification Purpose**" means the purpose of the TQ set out in Annex 1 of this Service Requirements;

"**Service Definition Table**" means the Table set out in Part 2 of this Service Requirements;

"**Service Requirement 1**" means that part of the Services (including the requirements for and the outcomes to be achieved by the Supplier as a result of the performance of that part of the Services) set out or referred to under the heading of "Service Requirement 1: Designing, developing and managing TQ Content" in the Service Definition Table;

"**Service Requirement 2**" means that part of the Services (including the requirements for and the outcomes to be achieved by the Supplier as a result of the performance of that part of the Services) set out or referred to under the heading of "Service Requirement 2: Assessment Design and Delivery" in the Service Definition Table;

"**Service Requirement 3**" means that part of the Services (including the requirements for and the outcomes to be achieved by the Supplier as a result of the performance of that part of the Services) set out or referred to under the heading of "Service Requirement 3: Grading and Awarding" in the Service Definition Table;

"**Service Requirement 4**" means that part of the Services (including the requirements for and the outcomes to be achieved by the Supplier as a result of the performance of that part of the Services) set out or referred to under the heading of "Service Requirement 4: Provider Approval" in the Service Definition Table;

"**Service Requirement 5**" means that part of the Services (including the requirements for and the outcomes to be achieved by the Supplier as a result of the performance of that part of the Services) set out or referred to under the heading of "Service Requirement 5: Provider Support" in the Service Definition Table;

"**Service Requirement 6**" means that part of the Services (including the requirements for and the outcomes to be achieved by the Supplier as a result of the performance of that part of the Services) set out or referred to under the heading of "Service Requirement 6: Student registration and Student entry" in the Service Definition Table;

"**Service Requirement 7**" means that part of the Services (including the requirements for and the outcomes to be achieved by the Supplier as a result of the performance of that part of the Services) set out or referred to under the heading of "Service Requirement 7: TQ Results" in the Service Definition Table;

"**Service Requirement 8**" means that part of the Services (including the requirements for and the outcomes to be achieved by the Supplier as a result of the performance of that part of the Services) set out or referred to under the heading of "Service Requirement 8: TQ Post-Results Services" in the Service Definition Table;

"**Service Requirement 9**" means that part of the Services (including the requirements for and the outcomes to be achieved by the Supplier as a result of the performance of that part of the Services) set out or referred to under the heading of "Service Requirement 9: Reporting" in the Service Definition Table;

"**TQ Critical Path Diagram**" means the diagram setting out the critical path for the design, development and delivery of the TQ attached at Annex 4 to the Service Requirements;

“**TQ Live Assessment Materials**” means the live assessment materials referred to in, and meeting the requirements of, the Product Description for the TQ Live Assessment Materials.

Part 1 – Overview of the Service Requirements

1 Introduction

1.1 This Part 1 of this Service Requirements sets out:

1.1.1 at paragraph 2, that part of the Services relating to the design, development and delivery of the Initial TQ Deliverables and Guide Standard Exemplification Materials and the review and update of such Initial TQ Deliverables and/or the TQ Deliverables (as the case may be), including the Initial Development Services and the Ongoing Development Services;

1.1.2 at paragraph 3, that part of the Services relating to the Provider Approval and monitoring services (as detailed in that paragraph 3);

1.1.3 at paragraph 4, that part of the Services relating to the support to be provided to Eligible Providers and Approved Providers (as detailed in that paragraph 4);

1.1.4 at paragraph 5, that part of the Services relating to Student registration and Student assessment entry (including Additional Services) (as detailed in that paragraph 5);

1.1.5 at paragraph 6, that part of the Services relating to the design and delivery of the TQ Live Assessment Materials (as detailed in that paragraph 6);

1.1.6 at paragraph 7, that part of the Services relating to grading and awarding in respect of each Student's performance in respect of the TQ Live Assessment Materials (as detailed in that paragraph 7);

1.1.7 at paragraph 8, that part of the Services relating to the provision of results (as detailed in that paragraph 8);

1.1.8 at paragraph 9, that part of the Services relating to the provision of Post-Results Services (including Additional Services) (as detailed in that paragraph 9);

1.1.9 at paragraph 10, that part of the Services relating to the reporting of Management Information (as detailed in that paragraph 10); and

1.1.10 at paragraph 11, such other services as may be necessary to support and/or are associated with the provision of the Services (as detailed in that paragraph 11).

1.2 Paragraphs 2 (*Initial TQ Deliverables and development services*) to 9 (*TQ Post-Results Services*) shall be read in conjunction with the TQ Critical Path Diagram.

1.3 The Supplier shall design, develop, obtain IfATE Approval for, and deliver to Approved Providers in England, the technical qualification element of the T Level for the relevant Pathway under this Contract, including, without prejudice to its obligations in clause 3.1.8 (*How the Services must be supplied*), performing all of the Services set out in this Service Requirements.

1.4 Unless otherwise stated in this Service Requirements, the Supplier shall organise and deliver the Services:

1.4.1 to ensure that the activities contemplated by the Key Dates Schedule for the relevant Academic Year and/or the TQ Content Updating Schedule (and which rely on the performance of the whole or any part of the Services) can be carried out and completed in accordance with such Key Dates Schedule and/or the TQ Content Updating Schedule (as the case may be);

1.4.2 in accordance with the Implementation and Delivery Plan;

1.4.3 in accordance with the Resource Plan;

1.4.4 in accordance with the Approved Assessment Strategy; and

1.4.5 (at all times) taking into account the aims of the Qualification Purpose.

1.5 The Supplier shall, subject to paragraphs 2.5 and 2.6 (*Initial TQ Deliverables and development services*) and paragraph 6.3 (*TQ live assessment design and delivery*) and without prejudice to paragraph 2.1 to 2.4 (*Initial TQ Deliverables and development services*) (inclusive), provide a copy of any Products that are developed, amended, updated and/or supplemented from time to time by the Supplier in accordance with this Contract to the Authority as soon as reasonably practicable following such development, amendment, update and/or supplement.

1.6 If there is any conflict and/or inconsistency between the provisions of this Service Requirements and the Conditions of Recognition, the Conditions of Recognition shall prevail.

1.7 Without prejudice to paragraph 1.4.1, the Supplier shall organise and deliver the Services to ensure that all applicable parts of the Services are provided at such times and in such manner as shall be necessary to facilitate the delivery of the number of assessment series for the TQ as shall be contemplated by the Key Dates Schedule for the relevant Academic Year, subject always to the provisions of paragraphs 1.8 to 1.10 (inclusive).

1.8 The Supplier shall ensure that there shall be at least one, but not more than two, assessment series in each Academic Year in respect of each of the assessments for:

1.8.1 the TQ Core Component (comprising the External Examination and the Employer Set Project); and

1.8.2 the Occupational Specialist Components.

1.9 The Supplier acknowledges that the assessments in each Academic Year for the TQ Core Component and the Occupational Specialist Components referred to in paragraph 1.8 may be, but are not required to be, held in the same assessment series and so therefore can be for example:

1.9.1 provided in a single assessment series (encompassing both such assessments for the TQ Core Component and the Occupational Specialist Components); or

1.9.2 provided in two assessment series (for each of such assessments for the TQ Core Component and the Occupational Specialist Components) being a total of four assessment series.

1.10 The Supplier shall ensure that:

1.10.1 each Student takes all of the assessments for the TQ Core Component referred to in paragraph 1.8.1;

1.10.2 each Student takes all of the assessments for each individual Occupational Specialist Component referred to in paragraph 1.8.2 in the same assessment series;

1.10.3 a Student may, subject to paragraphs 1.10.1 and 1.10.2, take the assessments for the TQ Core Component and the Occupational Specialist Components referred to in paragraph 1.8 in different assessment series (including assessment series in different Academic Years); and

1.10.4 its approach to the scheduling of the assessments shall be set out in its Assessment Strategy.

2 Initial TQ Deliverables and development services

Initial Development Services

2.1 Without prejudice to the Supplier's obligations in clause 3.1 (*How the Services must be supplied*) and clause 5 (*Developing the TQ and achieving IfATE Approval*), the Supplier shall design, develop and deliver the Initial TQ Deliverables in accordance with (and meeting all of the requirements of):

2.1.1 the Product Description for each item forming part of the Initial TQ Deliverables;

2.1.2 the Former Supplier's TQ Specification and/or ,if relevant, the Outline Content;

2.1.3 the requirements set out in the third column of Service Requirement 1, Service Requirement 2, Service Requirement 3 and Service Requirement 4;

2.1.4 the Implementation and Delivery Plan (including the Supplier's obligation to work with and consult (and take into account the outcome of such working with and consultation of) a representative sample of Providers and Employers (as required by that Implementation and Delivery Plan);

2.1.5 the Resource Plan;

2.1.6 the Assessment Strategy; and

2.1.7 Annex 7 (*Initial Development Milestones*) to this Service Requirements,

and, in each case, to ensure the delivery of a high quality technical education qualification element of the T Level for the relevant Pathway and that the outcomes referred to in the first column of Service Requirement 1, Service Requirement 2, Service Requirement 3 and Service Requirement 4 are achieved (the "**Initial Development Services**").

2.2 The Supplier shall procure that, without prejudice to its obligations in clause 5.13.2 (*Developing the TQ and achieving IfATE Approval*), the Initial TQ Deliverables

(meeting all of the requirements of paragraph 2.1) shall be delivered to the Authority on or prior to the Final Approval Milestone Date.

Ongoing Development Services

2.3 The Supplier shall procure that (without prejudice to the Supplier's obligations in clause 3.1 (*How the Services must be supplied*) and clause 5.3 (*Developing the TQ and achieving IfATE Approval*) and notwithstanding the achievement of IfATE Approval in respect of the Initial TQ Deliverables) throughout the Term the TQ Deliverables meet (and continue to meet) all of the requirements of:

2.3.1 the Product Description for each item forming part of the TQ Deliverables;

2.3.2 the Former Supplier's TQ Specification and, if relevant, the Outline Content;

2.3.3 the requirements set out in the third column of Service Requirement 1, Service Requirement 2, Service Requirement 3 and Service Requirement 4;

2.3.4 the Implementation and Delivery Plan (including the Supplier's obligation to work with and consult (and take into account the outcome of such working with and consultation of) a representative sample of Providers and Employers (as required by that Implementation and Delivery Plan));

2.3.5 the Resource Plan;

2.3.6 the Approved Assessment Strategy; and

2.3.7 clause 8 (*TQ Changes*) and Annex 6 (*TQ Content Updating Schedule*) to this Service Requirements,

and in each case, to ensure the continued delivery of a high quality technical education qualification element for the T Level for the relevant Pathway and that the outcomes referred to in the first column of Service Requirement 1, Service Requirement 2, Service Requirement 3 and Service Requirement 4 are achieved (the "**Ongoing Development Services**").

2.4 The Supplier shall procure that the TQ Deliverables (as amended, supplemented or replaced in accordance with clause 8 (*TQ Changes*) and Annex 6 (*TQ Content Updating Schedule*) to this Service Requirements) shall be delivered to the Authority

on or prior to the applicable date specified on the Key Dates Schedule for the relevant Academic Year or TQ Content Updating Schedule (as applicable).

Updating the Implementation and Delivery Plan and the Resource Plan

2.5 Subject to the provisions of paragraph 1 *(Key Personnel)* of Schedule 7 *(Staff including Key Personnel)*, the Parties acknowledge and agree that the Implementation and Delivery Plan and the Resource Plan are intended to be live documents that may need to flex from time to time to ensure the continued successful delivery of the Services to the standards required by this Contract and the Supplier shall, throughout the Term, review, amend and update (as necessary) each of the Implementation and Delivery Plan and the Resource Plan to ensure that such Implementation and Delivery Plan and Resource Plan takes into account (and (where applicable) mitigates the effects of) all relevant factors that have impacted or may impact upon the successful delivery of the Services to the standards required by this Contract, provided always that where any such review, amendment and/or update would (or is reasonably likely to) operate to reduce and/or otherwise diminish the Authority's rights and/or remedies and/or the Supplier's liabilities contemplated by this Contract (including where, but for such review, amendment and/or update, the Supplier would (or would be reasonably likely to) be in Default under this Contract), the Supplier shall:

2.5.1 submit such proposed reviewed, amended and/or updated Implementation and Delivery Plan and/or Resource Plan (as the case may be) to the Authority for Approval; and

2.5.2 where the Supplier does not obtain such Approval, the Implementation and Delivery Plan and/or Resource Plan (as the case may be) shall be deemed not to have been so reviewed, amended and/or updated to the extent that such review, amendment and/or update would (or would be reasonably likely to) operate to so reduce the Authority's rights and/or remedies and/or the Supplier's liabilities under this Contract.

Updating the Approved Initial TQ Deliverables and TQ Deliverables

2.6 The Supplier shall, notwithstanding the achievement of IfATE Approval in relation to the Initial TQ Deliverables and subject to the provisions of clauses 8.4 and 8.5 (*TQ Changes*) and Annex 6 (*TQ Content Updating Schedule*) to this Service Requirements (which shall apply in respect of the annual review referred to in such clauses 8.4 and 8.5 (*TQ Changes*)), be required to keep under review, and entitled to amend and update, the Approved Initial TQ Deliverables and the TQ Deliverables throughout the

Term to ensure that the Supplier continues to meet its obligations under paragraph 2.3, provided always that the Supplier shall:

2.6.1 notify the Authority (as part of the Operational Delivery Report) of any proposed amendments and/or updates to such Approved Initial TQ Deliverables and/or TQ Deliverables; and

2.6.2 comply with the applicable requirements of clauses 8.10 and 8.11 (*TQ Changes*) prior to making available any such amended and/or updated Approved Initial TQ Deliverables and/or TQ Deliverables to Approved Providers and provided further that the words "*by the relevant date prescribed by the TQ Content Updating Schedule*" in such clauses 8.10 and 8.11 shall be deemed to be deleted for the purposes of this paragraph 2.6.

3 TQ Provider Approval and monitoring services

3.1 Without prejudice to the Supplier's obligations in clause 3.1 (*How the Services must be supplied*), the Supplier shall, following IfATE Approval:

3.1.1 provide that part of the Services referred to in the third column of Service Requirement 4 to ensure that the outcomes referred to in the first column of Service Requirement 4 are achieved; and

3.1.2 monitor the delivery by Approved Providers of the TQ (and the Approved Provider's continuing satisfaction of all of the requirements of the Provider Approval Criteria) in accordance with the monitoring arrangements set out in the Approved Assessment Strategy.[1]

3.2 Without prejudice to the Supplier's obligations in clause 3.1 (*How the Services must be supplied*) and paragraph 10.1 (*Reporting*) below, the Supplier shall notify the Authority (and provide full details of the circumstances) as soon as reasonably practicable where:

3.2.1 it reasonably believes that an Eligible Provider may not become an Approved Provider;

3.2.2 an Eligible Provider does not become an Approved Provider;

[1] These proposed arrangements should form part of the Supplier Response.

3.2.3 it reasonably believes that an Approved Provider may cease to be an Approved Provider;

3.2.4 an Approved Provider ceases to be an Approved Provider; and/or

3.2.5 the monitoring referred to in paragraph 3.1.2 reveals (and/or the Supplier otherwise becomes aware of):

(i) any failure by the Approved Provider to comply with the Approved Provider's Quality Assurance Process in the applicable Provider Contract;

(ii) any event, matter or circumstance which has had (or is reasonably likely to have) an adverse impact on Students (including as a result of an Appeal referred to in Service Requirement 8) and/or shall or may bring the T Level Programme into disrepute; and/or

(iii) any malpractice and/or maladministration on the part of the Approved Provider (including where any confidential TQ Live Assessment Materials (and/or the content of or information about such TQ Live Assessment Materials) is lost, stolen or transmitted).

3.3 The Supplier shall, as soon as reasonably practicable following the occurrence or identification of any matter referred to in paragraph 3.2, notify the Eligible Provider or Approved Provider (as the case may be) of any steps that are necessary to be taken by such Eligible Provider or Approved Provider (as the case may be) to remedy such matters and/or such failure and shall (as soon as reasonably practicable) notify the Authority (and provide full details) of such steps, together with details of the action that the Supplier will be taking to:

3.3.1 procure that the Eligible Provider or Approved Provider (as the case may be) takes such steps; and/or

3.3.2 mitigate the effects of such failure and/or matters.

3.4 The Supplier shall:

3.4.1 use all reasonable endeavours to procure that the Eligible Provider or Approved Provider (as the case may be) takes the steps referred to in paragraph 3.3; and

3.4.2 take the action referred to in paragraph 3.3,

together with, in either case, such further steps and/or action as the Authority may reasonably require following the notification referred to in paragraph 3.3.

3.5 The Supplier shall (in such manner (including as to timing) as the Authority may reasonably require) keep the Authority updated as to:

3.5.1 the progress by the Eligible Provider or Approved Provider (as the case may be) with the taking of the steps referred to in paragraph 3.3 (including (where applicable) whether the event, matter or circumstance giving rise to the requirement for the taking of such steps has been (or is reasonably likely to be) remedied); and

3.5.2 the action that the Supplier is taking and has taken in accordance with paragraph 3.4,

provided always that where the Supplier fails to comply with its obligations in paragraphs 3.2 to 3.4 (inclusive), such failure shall (notwithstanding the provisions of clauses 14.2.1 to 14.2.10 (*What may happen if there are issues with your provision of the Services*)) be deemed to give rise to a right for the Authority to issue written notification of Designated Action to the Supplier, to which the provisions this Contract (including clause 14.2 (*What may happen if there are issues with your provision of the Services*)) shall apply.

4 TQ Provider support services

4.1 Without prejudice to the Supplier's obligations in clause 3.1 (*How the Services must be supplied*) and Schedule 4 (*Co-operation*), the Supplier shall, throughout the Term, provide that part of the Services referred to in, and in accordance with, the third column of Service Requirement 5 to:

4.1.1 ensure that the outcomes referred to in the first column of Service Requirement 5 are achieved; and

4.1.2 following achievement of IfATE Approval, facilitate the implementation by Providers of the TQ in accordance with the Approved TQ Specification.

4.2 The Supplier shall, subject always to clause 4.12 and 4.13 (*Pricing and payments*), in respect of:

4.3 the Fees for the first Academic Year for the first Exclusive Cohort, make available details of the Fees to Eligible Providers and Approved Providers as soon as reasonably practicable;

4.4 the Fees for the second Academic Year, make available details of the Fees to Eligible Providers and Approved Providers no later than 30 April prior to the start of the second Academic Year; and

4.5 the third and each subsequent Academic Year, publish details of the Fees to Approved Providers no later than 30 April prior to the start of the relevant Academic Year.

5 Student registration and Student entry

5.1 The Supplier shall procure that Approved Providers have processes in place (and implement such processes) to ensure that, on or prior to the relevant date specified on the Key Dates Schedule for the relevant Academic Year, each Student is correctly registered for the TQ and in the manner contemplated by Service Requirement 6.

5.2 The Supplier shall procure that Approved Providers have processes in place (and implement such processes) to ensure that, on or prior to the relevant date specified on the Key Dates Schedule for the relevant Academic Year, each Student is correctly entered for assessment in respect of:

5.2.1 the TQ Core Component; and

5.2.2 each Occupational Specialist Component,

for which they are undertaking assessment.

5.3 The Supplier shall, following a request from an Approved Provider, provide the Additional Services referred to as “Late entry or entry amendment”, “Late registration or registration amendment”, “Very late entry or entry amendment” or “Very late registration or registration amendment” (as the case may be) in accordance with the applicable requirements set out against that Additional Service in Annex 10 (*Additional Services*) to this Service Requirements.

5.4 Without prejudice to the Supplier’s obligations in clause 3.1 (*How the Services must be supplied*) and paragraph 10.1 (*Reporting)* below, the Supplier shall ensure that, following IfATE Approval and (as applicable) in each Contract Month throughout the remainder of the Term, details of the registrations and assessment entries referred to in paragraph 5.1 and 5.2 are reported to the Authority in the Management Information

that is provided in respect of the Contract Month in which such registrations and/or entries are made, such reports to meet the requirements set out in the third column of each of Service Requirement 6 and Service Requirement 9 to ensure that the outcomes referred to in the first column of each of Service Requirement 6 and Service Requirement 9 are achieved.

5.5 Without prejudice to the Supplier's obligations in clause 3.1 (*How the Services must be supplied*) and elsewhere in this Service Requirements, the Supplier shall, as soon as reasonably practicable after:

5.5.1 becoming aware of any Approved Provider that is not registering any Students for the TQ (as contemplated by paragraph 5.1) and/or not entering Students for assessment (as contemplated by paragraph 5.2); and/or

5.5.2 becoming concerned as to the number of Students being registered for the TQ and/or being entered for assessment,

notify the Authority (together with full details) of such matter and/or concern.

6 TQ live assessment design and delivery

6.1 The Supplier shall (without prejudice to its obligations in clause 3.1 (*How the Services must be supplied*)):

6.1.1 on or prior to the relevant date specified on the Key Dates Schedule for the relevant Academic Year, design, develop and make available to Approved Providers the TQ Live Assessment Materials;

6.1.2 during the period specified on the Key Dates Schedule for the relevant Academic Year, administer the delivery by the Approved Providers of the TQ Live Assessment Materials and mark (or (where applicable) procure the marking and/or Moderation of) Student assessment evidence generated by the application and/or use (as the case may be) of such TQ Live Assessment Materials; and

6.1.3 during the period specified on the Key Dates Schedule for the relevant Academic Year and following a request from an Approved Provider, administer the delivery by that Approved Provider of the TQ Live Assessment Materials in respect of the Additional Services referred to as "Retakes" in accordance with the applicable requirements set out against that Additional Service in Annex 10 (*Additional Services*) of this Service

Requirements and mark (or (where applicable) procure the marking and/or Moderation of) Student assessment evidence generated by the application and/or use (as the case may be) of such TQ Live Assessment Materials,

in each case, in accordance with the then current Approved Assessment Strategy, subject to paragraph 6.2, the then current Approved Guide Standard Exemplification Materials or Grade Standard Exemplification Materials (as the case may be) and the requirements set out in the third column of Service Requirement 2 so as to ensure that the outcomes referred to in the first column of Service Requirement 2 are achieved.

6.2 The Supplier shall:

6.2.1 in respect of the First Teach Cohort for the relevant element of the Occupational Specialist Component, require the implementation and use by Approved Providers (including any assessors employed or engaged by any such Approved Provider and any Moderators where permitted in accordance with the Approved Assessment Strategy) and Assessors of the Approved Guide Standard Exemplification Materials for the purposes of assessing each Student's performance in respect of the TQ Live Assessment Materials; and

6.2.2 following grading of Student performance in respect of the TQ Live Assessment Materials undertaken by the First Teach Cohort of the relevant element of the Occupational Specialist Component and for each subsequent Cohort, develop, make available and require the implementation and use by Approved Providers (including any assessors employed or engaged by any such Approved Provider and any Moderators where permitted in accordance with the Approved Assessment Strategy) and Assessors of the Grade Standard Exemplification Materials.

6.3 The Supplier shall provide a copy of the TQ Live Assessment Materials to the Authority as soon as reasonably practicable following the date on which such TQ Live Assessment Materials are first made available to Students.

7 TQ grade awarding

7.1 Following completion of the live assessments referred to in paragraphs 6.1.2 and 6.1.3 (*TQ live assessment design and delivery*) in the relevant Academic Year, the Supplier shall (as soon as reasonably practicable but not later than the date specified on the Key Dates Schedule for the relevant Academic Year for such live assessments for that

Academic Year) assign a grade to each Student (to reflect the relevant marks awarded to each such Student) in respect of their performance in the assessment for the TQ Core Component and each Occupational Specialist Component that each such Student has undertaken in accordance with the requirements set out in the third column of Service Requirement 3 and so as to ensure that the outcomes referred to in the first column of Service Requirement 3 are achieved.

8 TQ results

8.1 The Supplier shall (as soon as reasonably practicable following completion of its obligations in paragraph 7.1 (*TQ grade awarding*), but not later than the date specified on the Key Dates Schedule for the relevant Academic Year), provide the results for each Student in the Cohort to the Authority or to the Authority's nominee (as notified by the Authority to the Supplier from time to time) in accordance with paragraph 8.2, such results to include details of:

8.1.1 the mark and grade awarded for the TQ Core Component;

8.1.2 the mark and grade awarded for each Occupational Specialist Component; and

8.1.3 such information and/or data as is required (including grade boundaries) by the Authority to award an overall grade for the T Level,

in each case, in respect of each TQ assessment that the relevant Student has undertaken.

8.2 Without prejudice to the Supplier's obligations in clause 3.1 (*How the Services must be supplied*) and paragraph 10.1 (*Reporting*) below, the Supplier shall ensure that the results referred to in paragraph 8.1 are provided to the Authority or to the Authority's nominee (as notified by the Authority to the Supplier from time to time) and reported to the Authority in the Management Information that is provided in respect of the Contract Month in which such results are required to be provided in accordance with paragraph 8.1, such results and report to meet the requirements set out in the third column of each of Service Requirement 7 and Service Requirement 9 to ensure that the outcomes referred to in the first column of each of Service Requirement 7 and Service Requirement 9 are achieved.

8.3 The Supplier shall (on the date specified on the Key Dates Schedule for the relevant Academic Year) provide to the Approved Provider a breakdown of attainment to allow

any Approved Provider and/or Student to make informed decisions about applications for (amongst other things) marking reviews and/or appeals (including a Review of Marking and/or Appeal as referred to in Annex 10 (*Additional Services*) to this Service Requirements), such breakdown (subject always to the provisions of clauses 13.10 to 13.12 (*Intellectual Property Rights*) (inclusive)) to be presented in such manner and/or format as shall not be capable of being regarded, interpreted and/or represented as a formal qualification certificate or statement of achievement.

9 TQ Post-Results Services

9.1 The Supplier shall, following the provision of the results referred to in paragraph 8.1 (*TQ results*) and, in respect of each Cohort, for a period expiring at the end of 2 Academic Years following the end of the final Academic Year for each such Cohort:

9.1.1 respond to enquiries about results; and

9.1.2 following a request from an Approved Provider made in accordance with the applicable Key Dates Schedule(s) referred to in paragraph 9.2, provide the relevant Additional Services requested by that Approved Provider (other than the Additional Services referred to in paragraph 5.3 (*Student registration and Student entry*) and 6.1.3 (*TQ live assessment design and delivery*), to which the provisions of those paragraphs shall apply) in accordance with the applicable requirements set out against the relevant Additional Services in Annex 10 (*Additional Services*) to this Service Requirements, (including as referred to in, and in accordance with, the third column of Service Requirement 8 to ensure that the outcomes referred to in the first column of Service Requirement 8 are achieved).

9.2 The Parties acknowledge and agree that the time period within which an Approved Provider may request the provision of the Additional Services referred to in paragraph 9.1.2 in relation to a Student that has undertaken an assessment (including an assessment that is a "Retake", as referred to in Annex 10 (*Additional Services*)) in an assessment series (the "**Relevant Assessment Series**") shall be as set out in the Key Dates Schedule(s) for the relevant Academic Year(s) applicable to the Relevant Assessment Series (including any Key Dates Schedule applicable to and/or regulating the provision of Additional Services in respect of assessments undertaken in the Relevant Assessment Series), provided always that nothing in this paragraph 9.2 shall operate to:

9.2.1 prevent or restrict (or be deemed to give rise to a right of the Supplier to prevent or restrict) any "Retakes" from being undertaken (or from being requested to be undertaken) in accordance with paragraph 6.1.3; and/or

9.2.2 extend the period referred to in paragraph 9.1.

10 Reporting

10.1 The Supplier shall (without prejudice to its obligations in clause 3.1 (*How the Services must be supplied*)) in each Contract Month throughout the Term, report to the Authority in accordance with (and provide such information as is required by) the requirements set out in the third column of Service Requirement 9 to ensure that the outcomes referred to in the first column of Service Requirement 9 are achieved.

11 Overarching services

11.1 The Supplier shall:

11.1.1 maintain, update and provide to the Authority (as required by clause 5.5.1 and paragraph 3.1 of Schedule 15 (*Monitoring of Performance*)) each of the Risk Register and the Issues Log;

11.1.2 implement, carry out and complete such steps (and within such time) as the Authority shall reasonably require arising out of the review of the Risk Register and/or the Issues Log pursuant to clause 5.5.1 (*Developing the TQ and achieving IfATE Approval*) and paragraph 3.1 of Schedule 15, (*Monitoring of Performance*) provided always that where the Supplier fails to implement, carry out and complete such steps in accordance with such requirements (including within such time), such failure shall (notwithstanding the provisions of clauses 14.2.1 to 14.2.10 (*What may happen if there are issues with your provision of the Services*)) be deemed to give rise to a right for the Authority to issue written notification of Designated Action to the Supplier, to which the provisions of this Contract (including clause 14.2 (*What may happen if there are issues with your provision of the Services*)) shall apply.

11.2 The Supplier shall provide all of the back-office systems and business processes necessary to enable the delivery of the Services, including IT systems, data security systems, accounting and administrative services.

11.3 The Supplier shall:

11.3.1 actively promote the T Level for which it is the TQ provider, coordinated in partnership with, and with the Approval of, the Authority; and

11.3.2 adhere to the Authority's guidelines in respect of all publicity and marketing material produced by the Supplier (or its Subcontractors) in relation to the T Level for which it is the TQ provider.

11.4 The Supplier shall, following any reasonable request from the Authority:

11.4.1 participate in and support any promotional activities intended to increase the uptake of T Levels by Providers and/or Students; and

11.4.2 without prejudice to its obligations in Schedule 4 (*Co-operation*) and Schedule 15 (*Monitoring of Performance*), attend and participate in any such meetings as the Authority may reasonably convene from time to time in connection with the T Levels Programme.

12 Efficiency

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13 Social Value Commitments

13.1 The Supplier must ensure it takes reasonable measures to meets its Social Value commitments, in full compliance with its response to Q9.6 of the Award Questionnaire in their tender submission.

Part 2 - Service Definition Table

This Part 2 sets out the outcomes each Service must deliver and the minimum requirements the Supplier must meet when delivering each Service.

Service Requirement 1: Designing, developing and managing TQ content		
Outcomes The Specification of Content is sufficiently clear and appropriately detailed to ensure Approved Providers can properly prepare Students for the TQ assessments. The knowledge, understanding, skills and behaviours specified in the Former Supplier's TQ Specification and, if relevant, the Outline Content in relation to the TQ Core Component are up-to-date and have been validated by employers to ensure that the TQ has continued currency among	**SR 1.1** Maintenance of the Specification of Content	1 **During the Initial Development, any removal of TQ Specification material from the Specification of Content must be justified and validated by a sufficient and representative sample of Employers.** Where the Supplier considers that it is necessary to remove content present in the existing TQ Specification, it shall provide a clear and detailed rationale as part of its Assessment Strategy included with the Submission for Interim Milestone 1 (and any subsequent milestones) to the Authority. Evidence from a representative sample of employers relevant to the sector must also be provided to support any proposals to remove any TQ Specification material from the Specification of Content. The Authority shall consider whether such content may be removed from the Specification of Content, provided always that the Authority's decision as to whether such content may be removed from the Specification of Content shall be final. 2 **During the Initial Development, the inclusion of additional material must be justified and validated by a sufficient and representative sample of Employers as agreed by the Authority.** The Supplier shall ensure that the Specification of Content does not include entirely new content, as distinct from updated content, that is not included in the existing TQ Specification, unless otherwise agreed by the Authority. Where the Supplier considers that it is necessary to include entirely new content, it shall provide a clear and detailed rationale as part of its Assessment Strategy included with the Submission for Interim Milestone 1 (and any subsequent milestones) to the Authority. Evidence from a representative sample of employers relevant to the sector must also be provided to support any proposals to remove any TQ Specification material from the Specification of Content. The Authority shall consider whether such new content may be included as part of the Specification of Content, provided always that the Authority's decision as to whether such new content may be included as part of the Specification of Content shall be final. The Supplier must show that new content must be covered at an appropriate depth for a level 3 qualification.

Employers and other end-users (including higher education providers). The knowledge, understanding, skills and behaviours specified in the Former Supplier's TQ Specification and, if relevant, the Outline Content in relation to each Occupational Specialist Component are up-to-date and ensure that the TQ has continued currency among Employers and other end-users (including higher education providers).		3 **During the delivery period the Supplier must ensure that the Specification of Content:** (a) enables accurate interpretation of the Specification of Content by Approved Providers (including to facilitate a clear and consistent understanding by Approved Providers of what is required to be taught and assessed for the TQ and to enable Approved Providers to determine (i) the level of competence required for staff who assess learning and (ii) any other physical requirements (such as facilities and hardware) integral to successful learning for the TQ); (b) supports Student progression and adaptability; (c) enables Students to achieve Occupational Entry Competence in relation to each Occupational Specialist Component; and (d) ensures that English, mathematics and digital** content is integrated within the rest of the content in such manner as shall ensure such content is delivered and assessed in appropriate occupationally specific contexts. 4 **Components should follow the same structure as set out in the existing TQ Specification.** The Supplier shall not move elements of the existing TQ Specification which relate to one Component into another Component, unless otherwise agreed by the Authority. Where the Supplier considers that it is necessary to move content from one Component to another, it shall provide a clear and detailed rationale as part of its Assessment Strategy for Submission at Interim Milestone 1 to the Authority and the Authority shall consider whether such content may be moved, provided always that the Authority's decision as to whether such content may be moved shall be final. 5 **The TQ has two types of Component.** The Supplier shall ensure that: (e) the TQ has only two types of Component and is **not** unitised any further, such that only the TQ Core Component and each Occupational Specialist Component are formally graded;

		(f) the **TQ Core Component** clearly assesses the core knowledge, understanding, skills and behaviours relevant to all occupations within the T Level; and (g) each **Occupational Specialist Component** clearly assesses the occupationally specific knowledge, understanding, skills and behaviours relevant to the occupations within the T Level. 6 **The TQ must not be biased towards any Occupational Specialist Component.** Where there is more than one Occupational Specialist Component for the TQ, the Supplier shall ensure that the TQ Core Component is not biased towards any particular Occupational Specialist Component. This is to ensure fairness for all Students, to support learning in their chosen Occupational Specialist Component. 7 **The TQ and its Components must be appropriately titled**. The Supplier shall ensure that the TQ and the Components reflect the titling conventions in the Former Supplier's TQ Specification and, if relevant, the Outline Content. The Supplier shall agree any amendments to the titling conventions of the TQ with the Authority and shall then use only this agreed title to refer to the TQ. 8 **The Specification of Content must support fair access to attainment, including for Students with special educational needs and/or disabilities.** Without prejudice to the Supplier's obligations in clause 3.1.7 (*How the Services must be supplied*) and clause 32 (*Equality, diversity, human rights and modern slavery*), the Supplier shall comply with all applicable Law and shall ensure that the Specification of Content is inclusive, including providing for Reasonable Adjustments and Special Consideration (as defined in SR 2.4 and SR 2.5 (respectively) below). The Supplier shall provide evidence that it has considered and addressed all such applicable Law relating to delivery of fair access to the TQ. 9 **Set recommended Guided Learning hours for each part of each Component.** The Supplier shall ensure that the Specification of Content details the recommended Guided Learning hours for each part of the TQ Core Component and each Occupational Specialist Component, including the recommended Guided Learning hours for both delivery and assessment of each such part of each such Component, provided that (i) such recommended hours are between a minimum of 900 hours and a maximum of 1400 hours and (ii) the maximum number of hours within the recommended range for the TQ Core Component are no more than 50%, and no

			less than 20%, of the overall time for the TQ. The Supplier shall provide a clear and detailed rationale for such recommended Guided Learning hours as part of its Assessment Strategy included with the Submission for the Final Approval Milestone to the Authority, or earlier at the Authority's request, and the Authority shall consider whether such proposed recommended Guided Learning hours may be included as part of the Specification of Content, provided always that the Authority's decision as to whether such recommended Guided Learning hours may be included as part of the Specification of Content shall be final. 10 **Combination of Occupational Specialist Components.** Where a T Level features more than one Occupational Specialist Component these should be specified as options from which a Student will typically select one Occupational Specialist Component. Where a Student is required to study two Occupational Specialist Components, the Supplier shall specify any prohibited combinations of Occupational Specialist Components, for example where there is overlap between the Occupational Specialist Component content or where there would be insufficient time to study a particular combination. The Supplier shall make it clear that Approved Providers can select the Occupational Specialist Component(s) they wish to deliver within these rules. Where rules of combination are given, the Supplier shall provide a clear and detailed rationale as part of its Assessment Strategy for Submission at Interim Milestone 1 which explains how any combinations are compatible and achievable within the duration of the TQ. 11 Where, in exceptional circumstances, the Supplier proposes to give Students the option to study more than two Occupational Specialist Components, it must provide a clear and detailed rationale as part of its Assessment Strategy for Submission at Interim Milestone 1 to the Authority and the Authority shall consider whether such rules of combination are appropriate, provided always that the Authority's decision as to whether such rules of combination are appropriate shall be final.
Service Requirement 2: Assessment design and delivery			
Outcomes The TQ provides for optimal assessment and reliable evidence	**SR 2.1** Assessment quality	1	The Supplier shall ensure that: (a) the Scheme of Assessment, the TQ Specimen Assessment Materials and the TQ Live Assessment Materials provide the optimum balance of the assessment principles set out below; and

of a Student's attainment in relation to the knowledge, understanding, skills and behaviours specified in the Former Supplier's Specification of Content and, if relevant, the Outline Content. The TQ supports fair access to attainment for all Students who take the TQ.		(b) the Assessment Strategy sets out a detailed rationale to explain how the TQ Specification, the TQ Specimen Assessment Materials and the TQ Live Assessment Materials meet these assessment principles. **Assessment principles** 1 **Validity.** The extent to which the TQ assessments (including the TQ Specimen Assessment Materials and the TQ Live Assessment Materials) effectively measure what they are intended to measure. This includes the extent to which TQ assessments (including the TQ Specimen Assessment Materials and the TQ Live Assessment Materials) allow Students to produce assessment evidence for the TQ that clearly corresponds to the Specification of Content and ensures the Specification of Content is not under-represented or misrepresented. 2 **Reliability.** This is about consistency and so concerns the extent to which the various stages in the TQ assessment process generate outcomes that would be replicated were the assessment repeated. The reliability of an assessment is affected by a range of factors, such as the sampling of assessment tasks and inconsistency in marking by human assessors. Reliability is critical to ensuring standards of attainment are equivalent over time (comparable performance). 3 **Comparable performance.** The extent to which the same grade for a Component with the same title indicates a comparable level of Student performance across Approved Providers (nationally) and over time. 4 **Minimising bias.** Ensuring that a TQ assessment (including the TQ Specimen Assessment Materials and the TQ Live Assessment Materials) does not produce unreasonably adverse outcomes for Students who share a particular characteristic. The Supplier should seek to ensure all Students are treated fairly and the assessment (including the TQ Specimen Assessment Materials and the TQ Live Assessment Materials) complies with all applicable Law. 5 **Minimising malpractice.** Ensuring the TQ design (including the TQ Specimen Assessment Materials and the TQ Live Assessment Materials) and processes relating to the delivery of the TQ assessments limit malpractice, including attempts by candidates to communicate with each

		other during an assessment and failures by Provider staff to comply with Supplier instructions regarding storage of Student assessment evidence. 6 **Appropriate demand.** This relates to the level of difficulty of a TQ assessment task (including within the TQ Specimen Assessment Materials and the TQ Live Assessment Materials) and the requirements of the relevant part of the Specification of Content which is to be assessed and any expectations of performance at specified grades. Demand should be appropriate to a level 3 qualification. 7 **Manageability.** The feasibility of carrying out the TQ assessment processes. A manageable assessment process is one that has reasonable expectations of Students, Approved Providers and (where appropriate) Employers. This will be based on the impact of the assessment process on Students, Approved Providers and (where appropriate) Employers as against the usefulness of the outcomes.
	SR 2.2 General assessment delivery requirements	The Supplier shall: 1 specify when the TQ assessments can be undertaken during the relevant Academic Year (taking into account any dates prescribed by the Key Dates Schedule for the relevant Academic Year) so that Students have sufficient time to generate assessment evidence and/or demonstrate the required knowledge, understanding, skills and behaviours; 2 notwithstanding the number of Assessors (and Moderators where permitted in accordance with the Approved Assessment Strategy) identified in the Implementation and Delivery Plan and/or the Resource Plan, ensure a sufficient number of qualified and trained Assessors (and such Moderators) are available to assess Students' assessment evidence for the TQ; 3 train Assessors (and Moderators where permitted in accordance with the Approved Assessment Strategy) so that their judgements in relation to the TQ assessments are consistent and accurate and applied in line with the standards defined by or through such training;

		4 sample the marking of live TQ assessments (to ensure accuracy and consistency) and, where such marking is not accurate and/or consistent, take all such steps as are necessary to ensure that such marking is accurate and consistent; 5 ensure the TQ Live Assessment Materials are made available to Approved Providers in English (online and/or in hard copy (as applicable)); 6 ensure the TQ Live Assessment Materials are available at the right time (online and/or in hard copy (as applicable)) in accordance with this Contract; 7 ensure that TQ Live Assessment Materials are free from errors and where any errors are identified in the TQ Live Assessment Materials they are dealt with appropriately, including through the issue of an erratum and by taking all such actions as are necessary to ensure that Students are not disadvantaged as a result of such errors; 8 where Student assessment evidence for the TQ is required to be generated under supervised conditions: (a) ensure that the nature of the supervised conditions and the hours for such supervised conditions are detailed in the TQ Specification; and (b) provide a clear and detailed rationale as part of its Assessment Strategy for Submission at Interim Milestone 4 to the Authority and the Authority shall consider whether such hours are appropriate, provided always that the Authority's decision as to whether such hours are appropriate shall be final; 9 ensure that Approved Providers comply with the Approved Provider's Quality Assurance Process, including: (a) keeping Students' assessment evidence for the TQ secure during and after assessment; and (b) verifying that a Student's assessment evidence for the TQ has been solely produced by that Student;

		10 following IfATE Approval, monitor the delivery of the TQ to identify any feature which could disadvantage a group of Students who share a particular characteristic and shall, as soon as reasonably practicable following identification of such a feature, take such steps as are necessary to minimise the feature being an unnecessary barrier to Student attainment; 11 monitor and investigate instances of malpractice and/or maladministration relating to the TQ in accordance with paragraph 3 (TQ Provider Approval and monitoring services) of Part 1 of this Service Requirements; 12 ensure final marks awarded by Assessors (and Moderator final marks and/or judgements, where permitted in accordance with the Approved Assessment Strategy) in relation to the TQ are collected for each Student and checked for accuracy by the relevant date specified in the Implementation and Delivery Plan; and 13 where marking is to be applied to Student assessment evidence for the TQ by Assessors (and/or by assessors employed or engaged by Approved Providers and/or Moderation is to be undertaken in relation to such marking (in circumstances where the Approved Assessment Strategy allows for use of assessors employed or engaged by the Approved Provider)), ensure: (a) such Assessors (and assessors and Moderators) are appropriately trained and competent; (b) such Assessors (and Moderators) have no personal interest in the outcome of the marking; and (c) marking and Moderation is conducted in a way which secures the accuracy of marking and a consistent approach to marking, provided always that where the Supplier determines that such marking and/or Moderation is not being undertaken accurately and consistently, it shall correct any inaccuracies and/or inconsistencies and shall take (or shall (where necessary) procure that the relevant Approved Provider and/or Moderator shall take (as the case may be)) all necessary steps to prevent any future recurrence of such inaccuracy and/or inconsistency.
	SR 2.3	1 The Supplier shall ensure that it has all necessary processes in place to ensure that, where TQ Live Assessment Materials are confidential (including the content of or information about

	Confidentiality of TQ Live Assessment Materials	such TQ Live Assessment Materials), all such TQ Live Assessment Materials remain confidential. 2 If, notwithstanding the processes referred to above, a breach of confidentiality in relation to the TQ Live Assessment Materials does occur (including through the loss, theft or transmission of confidential TQ Live Assessment Materials) or is either suspected by the Supplier or alleged by any other person (and where there are reasonable grounds for that suspicion or allegation), such matter shall be notified to the Authority in accordance with paragraph 3.2 of Part 1 of this Service Requirements and the provisions of paragraphs 3.3 to 3.5 (inclusive) of such Part 1 of this Service Requirements shall apply.
	SR2.4 Reasonable Adjustments	"**Reasonable Adjustments**" means such adjustments to and/or exemptions from the TQ Live Assessment Materials (as applicable) as are necessary and reasonable (in the context of what is being assessed) to enable a Student with special educational needs and/or disabilities to demonstrate his or her knowledge, understanding, skills and behaviours to the level of attainment required. The Supplier shall: 1 have in place clear arrangements for making Reasonable Adjustments; 2 explain (in the Assessment Strategy) how Reasonable Adjustments will be made to support fair access to attainment; and 3 provide details of such arrangements to Approved Providers, in each case, taking into account and (where applicable) implementing the process, approach and/or system agreed between the T Level Awarding Organisations pursuant to paragraph 2.1.8 of Schedule 4 (Co-operation).
	SR2.5 Special Consideration	"**Special Consideration**" means consideration to be given to a Student who has experienced a temporary illness, injury or other event outside of the Student's control and which has had, or is reasonably likely to have had, a material effect on that Student's ability to take a TQ assessment or demonstrate his or her level of attainment in a TQ assessment. The Supplier shall:

		1 have in place clear arrangements for Special Consideration; 2 explain (in the Assessment Strategy) how Special Considerations will be applied to support fair access to attainment; and 3 provide details to Approved Providers of how to request such Special Consideration, in each case, taking into account and (where applicable) implementing the process, approach and/or system agreed between the T Level Awarding Organisations pursuant to paragraph 2.1.8 of Schedule 4 (*Co-operation*).
	SR 2.6 TQ Core Component assessment design and delivery	1 **The TQ assessments must be appropriately weighted.** Where there is more than one Occupational Specialist Component for the TQ, the Supplier shall not weight the assessment of the TQ Core Component more heavily towards any one Occupational Specialist Component. This is to ensure fairness for all Students, to support learning in their chosen Occupational Specialist Component. 2 The Supplier shall assess the TQ Core Component using two distinct methods, as follows: (a) the core knowledge and understanding shall be assessed using an External Examination; and (b) the core skills and relevant aspects of core knowledge shall be assessed through the Employer Set Project in accordance with paragraph 3 below, in each case, as referred to in the Specification of Content. 3 Evidence generated by a Student in assessments of the Employer Set Project should be marked by an Assessor. However, in very exceptional circumstances set out in the Approved Assessment Strategy, an Approved Provider may be permitted to mark assessment evidence generated by a Student only where the Supplier: (i) puts in place robust arrangements which ensure that such marking achieves valid and reliable outcomes; (ii) uses an approach that is as close to complete independence as possible (such arrangements and approach to be

		detailed in the Approved Assessment Strategy); and (iii) procures that all such marking is subject to Moderation.[2] 4 **Assessment objectives.** The Supplier shall: (a) set out the assessment objectives for each of the External Examination and the Employer Set Project; and (b) specify the relevant weightings as between the External Examination and the Employer Set Project, in each case, in the Scheme of Assessment. 5 **Minimum performance requirements for the TQ Core Component must be clearly defined.** The Supplier shall ensure that: (a) the External Examination and the Employer Set Project are each assessed using compensatory assessment methods, such that high performance in one part of the TQ Core Component assessment compensates for lower performance in another; and (b) the minimum performance requirements for each judgemental grade required for the TQ Core Component shall reference each of the External Examination and the Employer Set Project. 6 **Devise the External Examination to assess the full range of knowledge and understanding outlined in the TQ Core Component.** The Supplier shall ensure that: (a) the External Examination will sample from the full breadth of relevant parts of the Specification of Content; and (b) an indicative sampling grid for the Term is included within the Assessment Strategy.

** Please refer to IfATE's Digital Skills and Characteristics Framework https://www.instituteforapprenticeships.org/media/gytp1kmq/digital-skills-and-characteristics-framework-web-version.pdf which has been developed to support the acquisition of appropriate digital knowledge and skills

[2] These proposed arrangements should form part of the Supplier's Response.

		7 **Assessment of core skills and relevant aspects of knowledge through Employer Set Project.** The Supplier shall develop briefs for Employer Set Projects and shall ensure that: (a) such briefs are developed in collaboration with Employers; (b) each such brief enables a Student to demonstrate core skills and relevant aspects of core knowledge in an occupationally relevant context; and (c) the Assessment Strategy outlines how such briefs will continue to be relevant to the TQ Core Component throughout the Term and how the Supplier will ensure that such Employer Set Projects do not become predictable and how they will keep pace with the needs of industry, in each case, so that new briefs for Employer Set Projects are made available by the Supplier in each Academic Year. 8 **Engage with relevant Employers to set clear project briefs**. The Supplier shall: (a) engage with Employers to ensure that sufficient project brief(s) is/are made available to enable Students to demonstrate skills across the breadth of the available Occupational Specialist Component(s), provided always that where the Supplier proposes to make available only one project brief in respect of the TQ to Students and/or proposes to utilise a project brief in respect of more than one Occupational Specialist Component, then: (i) the Supplier shall provide a detailed rationale for such proposals as part of its Assessment Strategy included with the Submission for Interim Milestone 1 to the Authority; (ii) the Authority shall consider whether such proposals are acceptable; and (iii) the Authority's decision as to whether such proposals are acceptable shall be final;

		(b) engage with Employers to ensure that each project brief: (i) has clear objectives, which align with the Specification of Content and which aim to motivate Students; (ii) requires Students to solve a real world problem; (iii) enables Students to generate sufficient assessment evidence to meet the objectives referred to in (i) immediately above; (iv) clearly sets out the arrangements and restrictions for Approved Providers to support Students in carrying out and completing the Employer Set Project; and (v) allows sufficient time to enable Students to generate sufficient assessment evidence; and (c) obtain evidence of validation from each Employer involved in setting the brief(s) that they approve such brief(s) (and the Supplier shall make available to the Authority a copy of such evidence). Evidence of employer validation must include, but is not limited to, details of the questions asked of Employers, Employer responses and how the AO addressed Employer feedback.
	SR 2.7 Occupational Specialist Component assessment design and delivery	1 **Assessment of performance outcomes**. The Supplier shall ensure that: (a) the assessment materials for each Occupational Specialist Component assess all performance outcomes detailed in the Specification of Content for that Occupational Specialist Component; and (b) so far as is reasonably practicable, each assessment is synoptic to reflect how knowledge, understanding, skills and behaviours are drawn together and implemented to develop meaningful occupationally relevant Student assessment evidence, which attests to Occupational Entry Competence, provided always that where the Supplier reasonably determines that it is not possible to assess performance outcomes synoptically, the Supplier shall provide a clear and detailed rationale as part of its Assessment Strategy for Submission at Interim Milestone 1 to the Authority and the

		Authority shall consider whether it is acceptable not to assess performance outcomes synoptically, provided always that the Authority's decision as to whether such approach is appropriate shall be final. 2 Evidence generated by a Student in assessments of each Occupational Specialist Component should be marked by an Assessor. However, in very exceptional circumstances set out in the Approved Assessment Strategy, an Approved Provider may be permitted to mark assessment evidence generated by a Student only where the Supplier: (i) puts in place robust arrangements which ensure that such marking achieves valid and reliable outcomes; (ii) uses an approach that is as close to complete independence as possible (such arrangements and approach to be detailed in the Approved Assessment Strategy); and (iii) procures that all such marking is subject to Moderation.[3] 3 **Exemplifying the expected standards of attainment**. The Supplier shall, for each Occupational Specialist Component, produce Guide Standard Exemplification Materials (which shall be validated by sufficient and representative sample of Employers and Providers as agreed by the Authority)) for the purposes of IfATE Approval and for the First Teach Cohort and, for each Academic Year following grade awarding for the First Teach Cohort, produce Grade Standard Exemplification Materials (which shall be validated by Employers before results are issued) and submitted to the Authority for agreement by no later than the end of September and published by the end of October of that Academic Year, unless otherwise agreed in writing by the Authority.
Service Requirement 3: Grading and Awarding		
Outcomes Grades awarded for the TQ Core Component and each Occupational	**SR 3.1**	1 The Supplier shall undertake grading and awarding in accordance with the relevant part of the Approved Assessment Strategy.

[3] These proposed arrangements should form part of the Supplier's Response.

Specialist Component are reliable and allow Employers and other end-users (including higher education providers) to accurately identify a Student's level of attainment and effectively differentiate their performance. The TQ supports fair access to attainment for all Students who take the TQ. The minimum pass grade standard for each Occupational Specialist Component attests to Occupational Entry Competence, meets Employer expectations, and is as close to full occupational competence as possible.		
Service Requirement 4: Provider Approval		
Outcomes	**SR4.1**	1 The Supplier shall receive and process applications from Eligible Providers to become Approved Providers in accordance with the relevant part of the Approved Assessment Strategy.

Approved Providers are capable of delivering the TQ to meet the required standards and expectations.		2 The Supplier shall (within 30 Working Days) following receipt of an application for Provider Approval from an Eligible Provider: (a) assess that Eligible Provider against the Provider Approval Criteria to determine whether such Eligible Provider satisfies all of the requirements of the Provider Approval Criteria; (b) notify that Eligible Provider of the outcome of its application; and (c) where the Eligible Provider satisfies all of the requirements of the Provider Approval Criteria, grant Provider Approval in respect of such Eligible Provider.
Service Requirement 5: Provider Support		
Outcomes Approved Providers are fully supported to plan and deliver (including to properly prepare Students for assessment) the TQ to meet the required standards and expectations.	**SR 5.1**	The Supplier shall ensure that Approved Providers are fully supported to promote, plan and deliver the TQ, including: 1 setting out in the TQ Specification and Assessment Guidance for Providers any guidance and support available to the Approved Provider in respect of the TQ, which may include guidance as to sequencing of assessment of any Component; 2 providing a telephone, email and internet facility and ensuring that sufficient, suitably trained contact staff are available to: (a) answer Approved Providers' queries regarding the Provider Services and/or the TQ (including enquiries and/or queries about results); (b) deal with complaints in relation to the Provider Services and/or the TQ; and (c) ensure that such queries and/or complaints (and any queries about the T Level Programme, including different programme elements and work placements) are directed to the relevant individual at the Supplier, the Authority or other Stakeholder (as applicable);

		3 ensuring that such training, resources and other information relating to the TQ, as is necessary to assist Approved Providers' administration and examination officers, is available, including in relation to: (a) key dates for administration of the TQ; (b) how to use any systems to upload materials; and (c) which forms should be used to enable Approved Providers to claim completion of the TQ by the relevant Student; 4 ensuring that such training, resources and other information relating to the TQ, as is necessary to assist Approved Providers' teaching and learning, is available to ensure the requirements of the TQ are clear and Students can be well prepared for assessment for the TQ, including: (a) exemplifying (through the provision of and training in relation to the application of the Guide Standard Exemplification Materials) the expected standards of performance for the TQ for the First Teach Cohort, so that the Approved Providers are able to design effective courses and have a clear understanding of the quality and standards their Students need to achieve; and (b) the development in accordance with Annex 11 to the Service Requirements, of (i) Supplementary Specimen Assessment Materials; (ii) Employer Set Project Guide Exemplar Responses; (iii) Employer Set Project Grade Exemplar Responses; and (iv) Accompanying Assessment Guidance for Providers; all of which must be suitable to be used by Approved Providers to prepare Students effectively for live TQ assessments; and (c) exemplifying (through the provision of documentation, including chief examiner and chief moderator reports, which provides an overview or analysis of Student performance and includes but is not limited to, examples of student responses to assessment questions and/or tasks) the expected standards of performance for the TQ,

		so that Approved Providers are supported in understanding how students performed at item, sub-component and component level to support future teaching and learning. 5 undertaking intermittent reviews to ensure that the support remains fit for purpose, taking account of feedback from Approved Providers and amending the support packages as necessary; 6 having in place systems and processes to monitor and report to the Authority details of Approved Provider uptake of the TQ Deliverables (and any other Products and/or documents associated with the TQ), ensuring each and every Approved Provider has accessed and is using the current version of the relevant TQ Deliverable. 7 aligning training and resources with any wider FE Professional Readiness to Deliver T Levels training and support offered by the Authority; and 8 supporting Approved Providers on agreed promotional activity, as appropriate following any reasonable request from the Authority.
Service Requirement 6: Student registration and Student entry		
Outcomes Unique identification of Students	**SR 6.1**	The Supplier shall procure that Approved Providers register each Student undertaking the TQ in a way that permits the Student to be clearly and uniquely identified.
Service Requirement 7: TQ Results		
Outcomes Accurate and complete results	**SR 7.1**	The Supplier shall ensure that all results which it issues are accurate and complete and reflect the outcome of the awarding process.

Service Requirement 8: TQ Post-Results Services		
Outcomes The TQ provides for optimal assessment and reliable evidence of a Student's attainment in relation to the knowledge, understanding, skills and behaviours specified in the Former Supplier's TQ Specification and, if relevant the Outline Content. The TQ supports fair access to attainment for all Students who take the TQ.	**SR 8.1** Assessment Review	The Supplier shall ensure a transparent and effective process for review of marks (or (where applicable) Review of Moderation (as defined in Annex 10 (*Additional Services*) to this Service Requirements) for each Component.[4]
	SR 8.2 Appeals Process	1 The Supplier shall operate an appeals process, which enables Approved Providers to appeal: (a) the results of TQ assessments undertaken by Students or (in the case of an appeal in respect of an individual Student) results of TQ assessments undertaken by that Student (including in either case the outcome of a Review of Marking and/or Review of Moderation);

[4] The proposed process should form part of the Supplier Response. This requirement will simply link to the proper implementation of that process.

		(b) any decisions regarding Reasonable Adjustments and/or Special Consideration for Students or (in the case of an appeal in respect of an individual Student) decisions regarding Reasonable Adjustments and/or Special Consideration for that Student; and (c) decisions which have resulted in action taken against that Approved Provider or (in the case of an appeal in respect of an individual Student) that Student in relation to the TQ, in either case, following an investigation into malpractice or maladministration,[5] (together or individually (as the case may be) an "Appeal"). 2 Where, as a result of an Appeal, the Supplier identifies that there is or was (as the case may be) a failure in its TQ assessment process affecting more than one Student, it shall: (a) notify the Authority of such failure (including full details of the impact of such failure); (b) identify all Students who have (or who may reasonably be expected to have) been affected by the failure; (c) correct or, where it cannot be corrected, mitigate as far as possible the effect of the failure; and (d) take all such steps as are necessary to ensure that such failure does not recur in the future, and the provisions of paragraphs 3.2 to 3.5 (inclusive) of Part 1 of this Service Requirements shall apply in respect of such failure.
Service Requirement 9: Reporting		
Outcomes Accurate and timely information and data is	**SR 9.1**	The Supplier shall ensure that the Management Information is provided to the Authority as follows. In the case of:

[5] The proposed appeals process should form part of the Supplier Responses. This requirement will simply link to the proper implementation of that process.

available throughout the Term		1	the Development Phase Report, in accordance with clause 5.5 (*Developing the TQ and achieving IfATE Approval*);
		2	the Operational Delivery Report, in accordance with paragraph 3.1 of Schedule 15 (*Monitoring of Performance*);
		3	the information and data generated pursuant to paragraph 5 of Part 1 of this Service Requirements, in accordance with paragraph 5.4 of Part 1 of this Service Requirements;
		4	the information and data generated pursuant to paragraph 8 of Part 1 of this Service Requirements, in accordance with paragraph 8.2 of Part 1 of this Service Requirements;
		5	the information and data relating to the delivery of the Additional Services in accordance with paragraphs 5.3, 6.1.3 and 9.1.2 of Part 1 of this Service Requirements, in each Contract Month; and
		6	the information and data relating to adjustment to the Fees pursuant to clauses 4.12 and 4.13 (*Pricing and payments*), in accordance with clause 4.13.1 (*Pricing and payments*).
		7	the information and data relating to the delivery of the Social Value commitments in accordance with paragraph 13.1 *(Social Value Commitments)*

Part 3 – Product Descriptions

This Part 3 sets out the Product Description for each Product.

Product	Description
Assessment Strategy	A clear and detailed explanation for how the TQ meets the outcomes/overall measures and requirements for each Service. In relation to the **design** of the TQ, the Assessment Strategy shall include details of and a clear and detailed rationale for: • how the design of the TQ will ensure compliance (including ongoing compliance) with all relevant requirements of this Service Requirements; • (i) individual assessment time for each TQ assessment, for example in terms of covering the required part of the Specification of Content effectively and balancing reliability and manageability, and (ii) combined assessment time for the different TQ assessments; • the number of marks for each individual TQ assessment, for example in terms of covering the required part of the Specification of Content effectively and balancing reliability and manageability; • how the design of the TQ will ensure appropriate compensation taking into account the requirements of SR 2.6 (5) (a) of Service Requirement 2; • the approach to differentiating for the available grade range in each case; • how Students' interests will be protected if there are changes to the Specification of Content; • the Guided Learning hours for each Component, taking into account the requirements of SR 1.1 (9) of Service Requirement 1;

Product	Description
	• if applicable, why Students have been given the option to study more than two Occupational Specialist Components; • the approach to how assessments will be structured, for example in terms of covering the required part of the Specification of Content effectively and achieving the optimum balance of the assessment principles set out in SR 2.1 of Service Requirement 2, including: o the number of tasks and assessments in the External Examination; o the number of tasks and assessments in the Employer Set Project; o the relative weightings of the External Examination and the Employer Set Project; o the number of tasks and assessments for each Occupational Specialist Component; o for Occupational Specialist Components, why it is not possible to assess performance outcomes synoptically (if applicable); and o how the Former Supplier's TQ Specification and, if relevant, the Outline Content will be covered over the life of the Contract including any proposed approach to sampling. • in very exceptional circumstances where the Supplier considers that there is justification for any assessments in relation to the Employer Set Project and/or the Occupational Specialist Components to be marked by an Approved Provider and not externally marked by an Assessor, a detailed rationale which explains why this is necessary in terms of achieving an optimum balance of the assessment principles set out in SR 2.1 of Service Requirement 2 and a detailed explanation of the approach to Moderation. Exceptional circumstances shall include the following factors: o where the assessment evidence generated by Students is likely to arise spontaneously and/or be ephemeral in nature and where this may lead to significant or insurmountable logistical difficulties in terms of the Supplier arranging to be present for every assessment; o where the assessment would require repeat measurement over an extended period of time, potentially including measurement of multiple aspects across multiple Students, rather than measurement on a single occasion and where this may lead to significant or insurmountable logistical difficulties in terms of the Supplier being present for the whole period of the assessment; o where the presence of an Assessor could significantly affect the assessment, for example because it may place undue pressure on Students and therefore undermine fairness, or could require the assessment to be designed and/or completed in an artificial way which would undermine validity; and

Product	Description
	○ where the presence of an Assessor is not possible owing to issues of sensitivity and/or confidentiality with respect to individuals required to participate in the assessment(s), provided always that the factor(s) giving rise to a claim by the Supplier of the existence of any exceptional circumstances are relevant to the content of the TQ, the risks to the validity or manageability of the assessment arising as a result of such factor(s) are significant and such factor(s) and/or risk(s) cannot be managed or mitigated without marking being undertaken by an Approved Provider; • the approach to coverage of the Former Supplier's TQ Specification and, if relevant the Outline Content, including: ○ how the Former Supplier's TQ Specification and, if relevant the Outline Content has been covered overall and in each TQ assessment; ○ how the Former Supplier's TQ Specification and, if relevant the Outline Content has been elaborated on where necessary; ○ if applicable, why it is necessary to move elements of the Former Supplier's TQ Specification and, if relevant, the Outline Content which relate to one Component into another Component; and ○ if applicable, why it is necessary to include entirely new content that is not included in the Former Supplier's TQ Specification and, if relevant, the Outline Content into the Specification of Content; • the approach to: ○ mapping of the Specification of Content in TQ Specimen Assessment Materials; ○ coverage of the Specification of Content over time; and ○ ensuring the assessments for the TQ Core Component and each Occupational Specialist Component support fair access to attainment, including the approach to Reasonable Adjustments and Special Consideration; • the assessment objectives and weightings for the External Examination and the Employer Set Project; • the approach to targeting assessment objectives in the External Examination and the Employer Set Project, and to targeting performance outcomes in each Occupational Specialist Component; • the approach to each TQ assessment, including: ○ an explanation of:

Product	Description
	▪ the range of task types to be used (e.g. multiple-choice, short answer, extended response, practical assignment) and how these will support valid assessment of the Specification of Content; and ▪ the approach to mark scheme and assessment criteria design, including for different task types, and an explanation of how resulting mark schemes and assessment criteria will support reliable application by Assessors (and any assessors employed or engaged by any Approved Provider and any Moderators where permitted in accordance with the Approved Assessment Strategy); o sample question/tasks which may be from the TQ Specimen Assessment Materials, and associated mark schemes and assessment criteria, representing the range to be used in each such TQ assessment, with commentaries explaining the approaches; o an indicative sampling grid for the External Examination; and o how the requirements of SR 2.6 (7) and SR 2.6(8) of Service Requirement 2 have been taken into account. • the approach to availability of TQ assessments, including: o when assessments will be scheduled for the External Examination, the Employer Set Project and each Occupational Specialist Component; o how the approach is appropriate, including consideration of: the amount and weight of material to be covered; the extent to which different aspects would be covered sequentially or concurrently; how coherence with the overall T Level Programme will be promoted; the need to ensure that enough time is available for sufficient learning to have taken place (including how Approved Providers will be supported so that they enter Students for a Component's assessments in an appropriate Academic Year and in an appropriate assessment series within that Academic Year, in each case, within the two-year programme for the T Level); and how the approach will support standard setting; o when the first assessment cycle will be held for the First Teach Cohort, taking into account the need to ensure that standards are set appropriately in the first Academic Year so they are appropriate to be carried forward to future assessment cycles; o arrangements for Students to retake, in full, any or all of the External Examination, the Employer Set Project and each Occupational Specialist Component; and o the type of assessment (e.g. online and/or paper-based) for the External Examination, Employer Set Project and each Occupational Specialist Component; and

Product	Description
	• quality assuring the design and development of the TQ and its component assessments in line with the requirements set out in the Service Requirements and in line with the Assessment Strategy. Taking into account the approach to availability of TQ assessments, the Assessment Strategy shall include a clear and detailed explanation of any risks that have been identified, how these will be mitigated, and how particular challenges will be addressed, including: • ensuring comparability of assessments; • minimising predictability of assessments; • ensuring security and confidentiality of assessments; and • in relation to the Employer Set Project, how the Employer Set Projects will continue to be relevant to the TQ Core Component throughout the Term and how they will not become predictable and will keep pace with the needs of industry. In relation to the **delivery** of the TQ, the Assessment Strategy shall include: • details of and a clear and detailed rationale for how the delivery of the TQ will ensure ongoing compliance with all relevant requirements of this Service Requirements; • clear details of the process for developing TQ assessment materials (including TQ Specimen Assessment Materials and TQ Live Assessment Materials), including different stages and Supplier Staff involved, how evidence regarding functioning of previous assessments is used, any differences by assessment type and item setting arrangements; • clear details of the approach to training individuals who will be responsible for setting TQ assessments and/or items, including ensuring security and mitigating any conflicts of interest; • details of the nature of and number of hours of supervised conditions that will be required to deliver the TQ; • clear details of the approach to training and standardising the approach of Assessors (and any assessors employed or engaged by any Approved Provider and any Moderators where permitted in accordance with

Product	Description
	the Approved Assessment Strategy), together with details of standardisation procedures and any wider training; • a clear and detailed explanation of how the marking processes for Student assessment evidence for the TQ will operate, including any variation between the External Examination, the Employer Set Project and each Occupational Specialist Component; • a clear and detailed explanation of the process that will be in place: o to monitor accuracy and consistency of marking by Assessors (and Moderation by Moderators where permitted in accordance with the Approved Assessment Strategy) and issuing of results, and o to take remedial action where such process does not deliver accuracy and consistency of marking (and/or Moderation by Moderators where permitted in accordance with the Approved Assessment Strategy) and/or issuing of results; • a clear and detailed explanation of how malpractice will be minimised and addressed and the approach to maintaining security and confidentiality of TQ assessments, including any differences by assessment; • a clear and detailed explanation as to how live issues during assessments for the TQ will be dealt with (i.e. where the design/delivery mitigations have failed); • a clear and detailed explanation as to how results data for each Component and the TQ will be provided to the Authority in line with the Key Dates Schedule for the relevant Academic Year; and • a clear and detailed explanation as to how each Post-Results Service (referred to in paragraph 9 (*TQ Post-Results Services*) of Part 1 of this Service Requirements) will be delivered.[6] In relation to **Eligible Providers and Approved Providers**, the Assessment Strategy shall include a summary of the proposed approach to ensuring that Approved Providers are able to prepare for and undertake the TQ assessments, together with a clear and detailed explanation of:

[6] The Supplier Response should detail the Supplier's proposals for the Additional Services. This requirement will link to the proper implementation of that part of the Supplier Response.

Product	Description
	• the approach to approving Eligible Providers as Approved Providers, in line with the Provider Approval Criteria; • the approach to ensuring that all Approved Providers have appropriate and consistent quality assurance measures in place for the delivery of the TQ and ensuring that such Approved Providers maintain ongoing compliance with those quality assurance measures; • the approach to the provision of guidance and training to Approved Providers in connection with the delivery of the TQ assessments for the Employer Set Project and the Occupational Specialist Components; • the approach to monitoring Approved Providers in relation to TQ assessments for the Employer Set Project and the Occupational Specialist Components, including how this approach will ensure that such assessments remain fit for purpose on delivery; • how Guide Standard Exemplification Materials will be produced, with input from and validated by a sufficient and representative sample of Employers and Providers as agreed by the Authority; and • how Grade Standard Exemplification Materials will be produced, and kept under review, with input from validated by a sufficient and representative sample of Employers as agreed by the Authority. In relation to **awarding**, the Assessment Strategy shall include a clear and detailed explanation of: • the technical methodology employed in the awarding process, including the Supplier Staff involved and their roles; • how the decisions from the awarding process are approved within the Supplier and the Supplier Staff involved in this; • how comparability between different versions of assessments and different types of assessment (e.g. online vs paper-based) is ensured, both where these are available at the same time and on an ongoing basis;

Product	Description
	• how comparability between any options in the TQ will be ensured; • how any evidence in relation to the comparability of the TQ with the technical education qualification element for other applicable T Levels within the same Route (including those offered by other T Level Awarding Organisations) will be used to inform decisions on standard setting; • how grades are calculated, including judgemental and arithmetic grade boundaries, aggregation of marks between the External Examination and Employer Set Project, and the use of any conversion scales; and • the approach to and range of qualitative and quantitative evidence used to inform grading and awarding decisions and the weight given to different sources, together with: o a rationale for this approach in the light of the TQ design and Cohort make-up; and o details of how this approach will be kept under review and may be adjusted, including any variation between initial standard setting and maintenance of standards, and in relation to such qualitative and quantitative evidence: o qualitative evidence shall include (for the TQ Core Component and each Occupational Specialist Component as a whole and for each TQ assessment): ▪ views of senior examiners about the quality of Student assessment evidence for the TQ; ▪ views of senior examiners about the demand of TQ assessments; ▪ performance descriptions informed by Employer views; ▪ Guide Standard Exemplification Materials and Grade Standard Exemplification Materials informed by Employer views; ▪ archive Student assessment evidence for the TQ from previous series (where applicable); and ▪ if necessary, cognate Student assessment evidence for the TQ, for example from related qualifications; and o quantitative evidence shall include (for the TQ Core Component and each Occupational Specialist Component as a whole and for each TQ assessment): ▪ mark distribution; ▪ mean mark; ▪ standard deviation;

Product	Description
	▪ item-level data, such as facility and discrimination indices; ▪ percentage of Students achieving each grade in previous series; and ▪ information about Students' prior/concurrent attainment. The Assessment Strategy shall also include an explanation as to how innovation will be appropriately tested before implementation to secure on-going compliance by the Supplier with its obligations under this Service Requirements.
Employer and Provider Engagement Strategy	A clear and detailed strategy describing the approach to engaging with, and where applicable training, Employers and Providers in relation to the design, content, delivery, assessment, validation and update of the TQ and the Services, including the approach to sharing early and/or amended drafts of all Initial TQ Deliverables and TQ Deliverables with Employers and Providers (as applicable).
TQ Specification	**Specification of Content** The Specification of Content shall set out the knowledge, understanding, skills and behaviours that Students need to learn for the TQ Core Component and each Occupational Specialist Component. The Specification of Content for the TQ Core Component and each Occupational Specialist Component must be clear and unambiguous and adequately cover (and where necessary build on) the Former Supplier's TQ Specification and, if relevant, the Outline Content (and not simply replicate it). The Specification of Content shall detail the recommended Guided Learning hours for each Component (including recommended Guided Learning hours for both delivery and assessment of each Component), taking into account the requirements of SR 1.1 (9) of Service Requirement 1. The TQ Specification will be validated by a sufficient and representative number of Employers as agreed by the Authority. **Scheme of Assessment** *TQ Core Component – External Examination – knowledge and understanding* The Scheme of Assessment shall clearly set out (in relation to the External Examination) an explanation for Approved Providers of:

Product	Description
	• the assessment objectives and their weightings; • the method and number of assessments (if more than one); • the duration of the/each assessment; • the number of marks in the/each assessment; • how and when the/each assessment will be made available; • the grades available for the TQ Core Component and that these grades are for the External Examination and the Employer Set Project in combination; and • any relevant design features for the External Examination, such as the range of different question types that will be used and any access there will be to stimulus/pre-release materials. *TQ Core Component – Employer Set Project* The Scheme of Assessment shall clearly set out (in relation to the Employer Set Project) an explanation for Approved Providers of: • the assessment objectives and their weightings; • the assessment tasks available, i.e. options; • the duration of the assessment; • the number of marks for the assessment; • how and when the assessment will be made available; • the assessment criteria that will be applied (including, in very exceptional circumstances set out in the Approved Assessment Strategy, where any assessments in relation to the Employer Set Project are to be marked by an Approved Provider and not externally marked by an Assessor, details of how marks should be allocated); • the conditions under which assessment evidence must be generated; • the forms of assessment evidence that must be retained by the Approved Provider and the expectations around this; • the grades available for the TQ Core Component and that these grades are for the External Examination and Employer Set Project in combination; and • (in very exceptional circumstances set out in the Approved Assessment Strategy, where any assessments in relation to the Employer Set Project are to be marked by an Approved Provider and not externally marked by an Assessor) details of how Moderation will be conducted.

Product	Description
	The Scheme of Assessment shall also: • specify the relevant weightings as between the External Examination and the Employer Set Project; and • outline the minimum performance requirements for each judgemental grade required for the TQ Core Component (and each judgemental grade shall reference both the External Examination and Employer Set Project). *Occupational Specialist Components* The Scheme of Assessment shall clearly set out (in relation to each Occupational Specialist Component) an explanation for Approved Providers of: • the performance outcomes and how these are mapped to the Former Supplier's Specification of Content and, if relevant, the Outline Content; • the assessment task(s) for the relevant Occupational Specialist Component; • the duration of the assessment; • the number of marks for the assessment; • how and when the TQ Live Assessment Materials will be made available; • the assessment criteria that will be applied (including, in very exceptional circumstances set out in the Approved Assessment Strategy, where any assessments in relation to the relevant Occupational Specialist Component are to be marked by an Approved Provider and not externally marked by an Assessor, details of how marks should be allocated); • the conditions under which Student assessment evidence must be generated; • the forms of Student assessment evidence that must be retained by the Approved Provider and the expectations around this; • any permissions/prohibitions with respect to different Occupational Specialist Components being taken in combination; • the grades available for the relevant Occupational Specialist Component; and • (in very exceptional circumstances set out in the Approved Assessment Strategy, where any assessments in relation to the relevant Occupational Specialist Component are to be marked by an Approved Provider and not externally marked by an Assessor) details of how Moderation will be conducted.

Product	Description
	Approved Provider's Quality Assurance Process This part of the TQ Specification shall set out details of the Approved Provider's role in quality assuring the TQ assessments, to ensure compliance by the Supplier with its quality assurance obligations in the relevant part of the Supplier Response[7], for example: • authentication – ensuring Students' assessment evidence is their own; • malpractice – for example during controlled conditions; and • any other activity required of Approved Providers by the Supplier to ensure regulatory/contractual requirements are met. **Additional Information for Approved Providers** The TQ Specification shall also clearly set out: • the Qualification Purpose; and • the prior learning requirements for the TQ (if applicable). The TQ Specification shall also clearly set out, or provide appropriate links to, information regarding: • calculating grades (e.g. aggregation and scaling); • submitting general queries; • access arrangements, Reasonable Adjustments and Special Consideration; • enquiries about results and Appeals; • retakes; and • any guidance in relation to delivery of the TQ.

[7] The proposed assurance arrangements should form part of the Supplier Response.

Product	Description
TQ Specimen Assessment Materials	The TQ Specimen Assessment Materials shall comprise examples of assessments that are representative of the approach the Assessment Strategy proposes is used in live operation and shall be produced to the same quality standard. The TQ Specimen Assessment Materials shall cover each of the following: • TQ Core Component – External Examination – sample question paper and mark scheme for the/each assessment, together with mapping to the Former Supplier's Specification of Content and, if relevant, the Outline Content and sampling approach proposed; • TQ Core Component – Employer Set Project – assessment tasks/requirements for each available option and assessment criteria; and • Occupational Specialist Component – practical assessment tasks/requirements and assessment criteria for each Occupational Specialist Component. TQ Specimen Assessment Materials for all components of the TQ will be validated by a sufficient and representative number of Employers as agreed by the Authority.
TQ Live Assessment Materials	The live assessment materials (modelled on the TQ Specimen Assessment Materials and taking into account (as applicable) performance demonstrated by previous TQ Live Assessment Materials) that are to form the basis of assessment for the TQ for the relevant Academic Year.
Exemplification Materials	**Guide Standard Exemplification Materials** Guide Standard Exemplification Materials shall include indicative 'guide' examples of Student assessment evidence which the Supplier judges would be likely to meet the minimum requirements for Occupational Entry Competence and higher grades in each Occupational Specialist Component. Guide Standard Exemplification Materials will be produced in consultation with and validated by Employers. Guide Standard Exemplification Materials must accurately portray student assessment evidence and may include, but is not limited to, the use of photographic, audio or video evidence accompanied by an explanatory commentary. **Grade Standard Exemplification Materials** Grade Standard Exemplification Materials shall include actual marked examples of Students' assessment evidence, selected after awarding, which:

Product	Description
	• have met the minimum requirements for Occupational Entry Competence and higher grades in each Occupational Specialist Component; • are produced (and reviewed on an ongoing basis) in consultation with and validated by Employers; • may be used to train Assessors (and any assessors employed or engaged by an Approved Provider and any Moderators where permitted in accordance with the Approved Assessment Strategy) to ensure that Student assessment evidence is assessed to the correct standard consistently, provided always that if the materials are used to train such Assessors (and any assessors and Moderators), the Supplier shall ensure that the spread of marks covered by the materials (including the Grade Standard Exemplification Materials) that are used for such training shall not be restricted to the grade boundaries but shall include material at a range of other marks; and • meet the requirements of SR 2.7(3) of Service Requirement 2. Student assessment evidence may include, but is not limited to, the use of photographic, audio or video evidence accompanied by an explanatory commentary.
Implementation and Delivery Plan	A detailed explanation of the Supplier's proposed approach to successfully designing, developing and delivering the TQ throughout the Term (the level of detail in respect of the whole (and each relevant part of such Term) being commensurate with the level of detail that can reasonably be expected to be known by and/or available to the Supplier from time to time in respect of such whole or part of the Term), including evidence of the achievability of the proposed approach against the TQ Critical Path Diagram. It shall present a clear and achievable overall timetable for the delivery of all of the Services. The Implementation and Delivery Plan shall include information about the Supplier's: • programme and project management approach and project expertise to develop the design, content, assessment and delivery of the TQ, including details of delivery risks and plan to mitigate such risks; • financial modelling on cost of design, development and delivery of the TQ and delivery of the Services;

Product	Description
	• approach to working with Stakeholders (including, if relevant, the T Level Panel up to Interim Milestone 1) in relation to the design, development delivery and ongoing update of the TQ and the Services (including consultation with Eligible Providers to ensure the quality of the Initial TQ Deliverables at each Milestone); • approach to working with Stakeholders and organisations associated with and/or providing advice and/or guidance in relation to Students with special educational needs and disabilities in the design, development, delivery and update of the TQ and the Services, including a process for regularly reporting on progress; • approach to sharing early and/or amended drafts of the Initial TQ Deliverables and TQ Deliverables with Eligible Providers and/or Approved Providers (as applicable), including how such documents will be shared and when; • capacity to scale up in relation to demand and in response to delivery challenges to ensure overall delivery remains on track; • ability to develop and implement innovative solutions; • approach to ensuring that Management Information is interoperable with the Authority's systems and processes during the design, development and live operation of the TQ; • proposals for efficiently supporting Providers to deliver the TQ and to answer related enquiries and address related complaints (including Post-Result Services) made by telephone, by post and by other electronic correspondence efficiently and effectively; • process for raising delays or concerns; and • details of proposed joint working between T Level Awarding Organisations (as contemplated by Schedule 4 (*Co-operation*)) to support (amongst other things) the effective and efficient delivery of the T Level Programme and to streamline administration relating to the T Levels Programme in the interests of Students and Providers. The Implementation and Delivery Plan shall evidence that the Supplier has, or will have: • IT infrastructure and systems to support the design, development, delivery and award of the TQ; • secured any relevant third party contracts to support delivery of the TQ; and • processes for the design, development, delivery and award of the TQ.
Resource Plan	A detailed explanation of the Supplier's proposed approach to resourcing to ensure performance of the Services, and the successful design, development and delivery of the TQ, which shall be in the format of the template Resource Plan issued by the Authority as part of the procurement process leading to the award of this Contract.

Product	Description
	The Resource Plan shall include detail about: • all types of resources required for delivery of the Services, including a distinction between those that will be dedicated to the TQ and those that will be used for other qualifications or business areas; • the resources that will be internal and those that will be external; • the skills and experience profiles for the required resources; • any existing skills or knowledge gaps that may exist with resources already in place and how and when additional resources will be recruited, mobilised, trained and managed; • the number of resources required (including the number of Assessors (and any Moderators where permitted in accordance with the Approved Assessment Strategy) required); • what the resources would be required to deliver and by when; • how long the relevant resources would be engaged; • processes, measures and strategies that will ensure proper, effective and resilient resourcing so that the TQ will at all times operate in accordance with the Service Requirements; • processes for keeping resource requirements under review; • the proposed approach to the recruitment (including the timescales for and number) of Assessors (and any Moderators where permitted in accordance with the Approved Assessment Strategy) which have recent relevant industry experience, including the trajectory that will be required to be maintained to meet the requirements for the provision of Assessors (and (where applicable) Moderators) under this Service Requirements; • the proposed approach to the training (including the timescales) of Assessors (and any Moderators where permitted in accordance with the Approved Assessment Strategy) which have recent relevant industry experience, including the trajectory that will be required to be maintained to meet the requirements for the provision of Assessors (and (where applicable) Moderators) under this Service Requirements; • the assessment expertise, which will be used to deliver assessment design and processes set out in the Assessment Strategy; and • the occupationally specific subject expertise needed to devise and assess Occupational Specialist Components.
Submission Issues Log	The log of issues raised by the Authority in respect of the Initial TQ Deliverables following a Submission and the Supplier's detailed description of how each such issue has been resolved.

Product	Description
Risk Register	The Supplier's register detailing any events, matters and/or circumstances which it reasonably foresees (acting in accordance with Good Industry Practice) may impact upon and/or risk the successful performance of the Services by the Supplier in accordance with this Contract (or, where the Supplier has failed to create, maintain and/or update such register, such register as would detail such events, matters and/or circumstances if the Supplier was complying with its obligations under this Contract).
Issues Log	The Supplier's log detailing any events, matters and/or circumstances which have occurred and which may impact (or have impacted) upon and/or risk the successful performance of the Services by the Supplier in accordance with this Contract (or, where the Supplier has failed to create, maintain and/or update such log, such log as would detail such events, matters and/or circumstances if the Supplier was complying with its obligations under this Contract).
Provider Approval Criteria	The Supplier's criteria for the approval of Eligible Providers to deliver the TQ which shall: • ensure that the Eligible Provider's ability to deliver the TQ to the required standards and expectations is assessed and verified; • ensure that the expertise of the Eligible Provider to deliver the TQ to the required standards and expectations is assessed and verified; • ensure that resources available to the Eligible Provider to deliver the TQ in line with the required standards and expectations is assessed and verified; • promote accessibility of the TQ to all Eligible Providers; • not impose any undue and/or overburdensome administrative, financial and/or operational requirements and/or require any change in the existing administrative, financial and/or operational aspects of an Eligible Provider's business and/or operations, in either case, which could not reasonably be expected by an Eligible Provider as being strictly necessary to deliver the TQ (having regard to the administrative, financial and/or operational aspects of the business and/or operations within which Providers (operating in the same or substantially similar business and/or operations as the Eligible Provider) operate; and • not be inconsistent with and/or lead to a breach of the requirements of clause 7.1 (*Interaction with Providers*).
Assessment Guidance for Providers	Assessment Guidance shall be produced **along with** the specimen assessment materials (SAMs) and will

Product	Description
	include guidance to ensure that Providers are fully supported to prepare students for assessment. This guidance must include information relating to each component, task or similar activity. Guidance must also include but is not limited to, information on how to prepare for and administer assessments and where applicable, how to submit assessment evidence, guidance on marking and moderation as well as any other information that is required to ensure that students and Providers are fully prepared for assessments. The content must be tailored for each series and identify and expand on the guidance given for all practical assessments. Assessment Guidance must be produced in consultation with a sufficient and representative sample of Providers.

ANNEX 1 – QUALIFICATION PURPOSE

The purpose of the level 3 TQ is to ensure Students have the knowledge, skills and behaviours needed to progress into skilled employment or higher level technical training relevant to the T Level.[8]

To achieve this, each level 3 TQ must:

- provide reliable evidence of Students' attainment in relation to:
    - the core knowledge and skills relevant to the Route and Occupational Specialist Component(s) covered by the TQ; and
    - the knowledge, skills and behaviours required for at least one Occupational Specialist Component relevant to the TQ;
- be up-to-date, ensuring the knowledge, skills and behaviours needed for the Occupations have continued currency among Employers and other end-users;
- ensure maths, English and digital skills continue to be applied where they are essential to achieve occupationally relevant outcomes;
- ensure the minimum pass grade standard for Occupational Specialist Components attests to Occupational Entry Competence, meets employer expectations, and is as close to full occupational competence as possible;
- allow end users to accurately identify Students' level of attainment and effectively differentiate their performance;
- provide a clear and coherent basis for development of suitably demanding high-quality level 3 courses, which enable Students to realise their potential;
- provide Students with the opportunity to manage and improve their own performance; and
- support fair access to attainment for all Students who take the TQ, including those with special educational needs and disabilities.

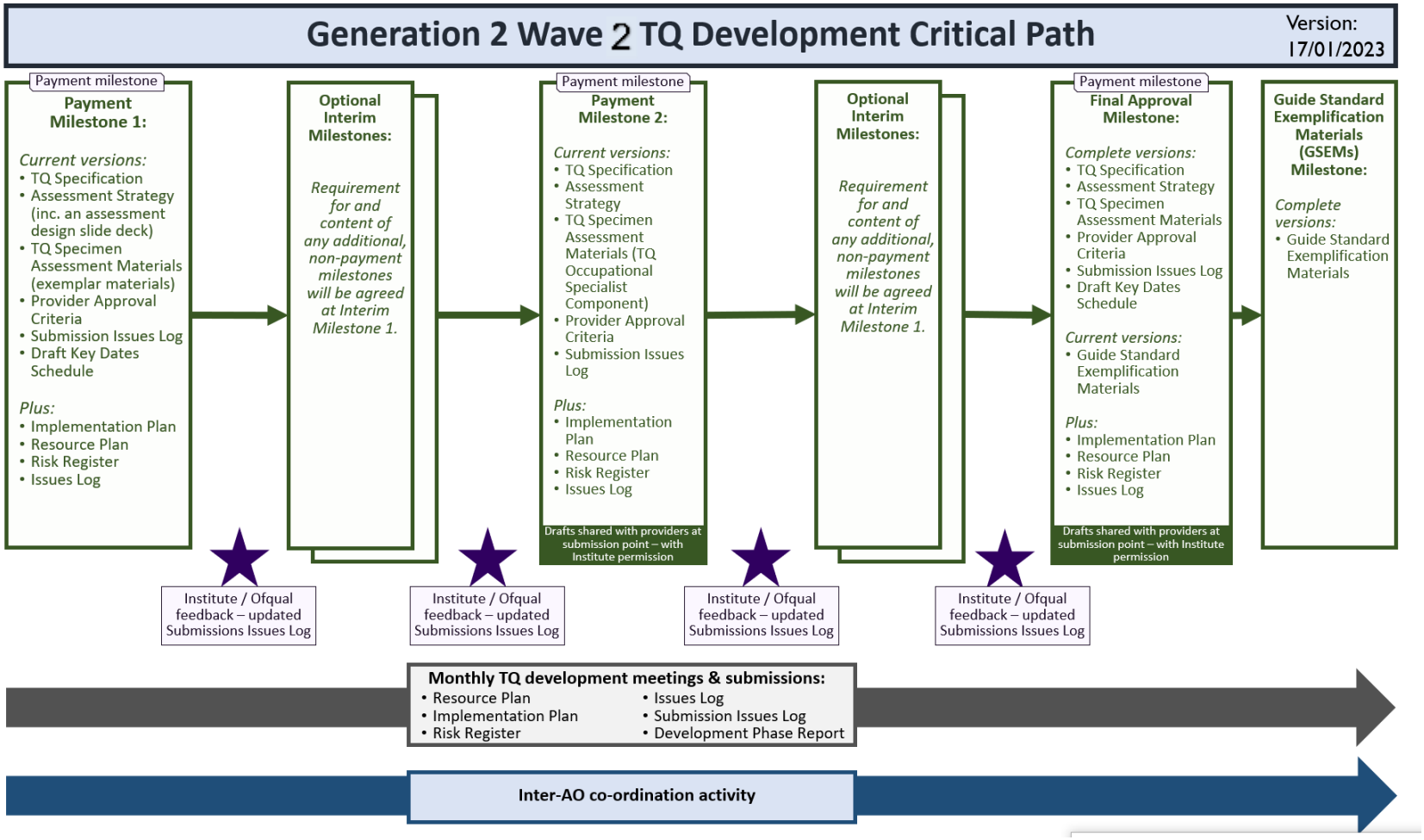
[8] The Authority may only grant IfATE Approval of the qualification "if satisfied that by obtaining the qualification a person demonstrates that he or she has attained as many of the outcomes set out in the standards as may reasonably be expected to be attained by undertaking a course of education" (sA2DA(3) of the 2009 Act).

ANNEX 2 – INTENTIONALLY BLANK

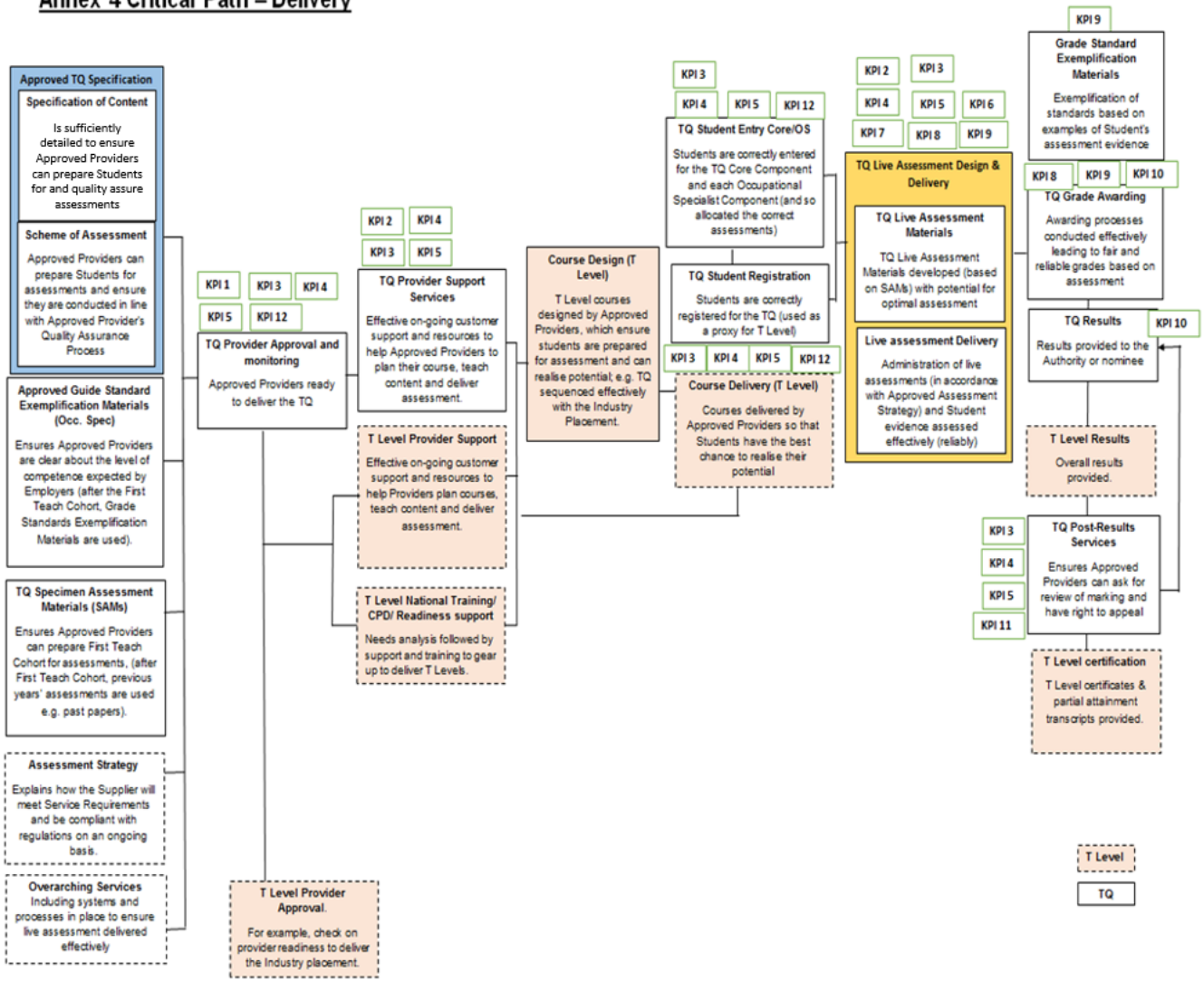
ANNEX 3 – FORMER SUPPLIER'S TQ SPECIFICATION

The TQ Specification content for this Annex is contained in a separate folder - at GEN2W2_ITT_Attachment_11_TQ_Specs

ANNEX 4 – TQ CRITICAL PATH DIAGRAM



Annex 4 Critical Path – Delivery



ANNEX 5 – INDICATIVE KEY DATES SCHEDULE[9]

To meet the requirements of Schedule 4 (*Co-operation*) the Supplier, working with other T Level Awarding Organisations, will need to produce a Key Dates Schedule, which secures the efficient and effective delivery of each assessment series for the TQ. Within the Key Dates Schedule, the deadline for submitting TQ Student registration data to the Authority must be in November in the first year of study. For a summer assessment series results must be issued on or no later than the date A level results are issued.

For a summer assessment series the key dates could include but are not restricted to:

Key Date	**Description**	**Assessment series**
November (Yr1)	Deadline for submitting TQ Student registration data to the Authority	All
3rd week Feb	Deadline for entries for assessments by Approved Providers	June
3rd week Feb	Final date for submitting Reasonable Adjustment requests to the Supplier by Approved Providers	June
4th week Feb	Assessment timetable issued	June
2nd week May	First date for submitting Special Consideration requests to the Supplier	June
2nd week May-3rd week June	Assessments take place	June
3rd week August	Restricted release of T Level results to Approved Providers by the Authority	June
3rd week August	Release of results to Students by the Authority	June

[9] This is an indicative Key Dates Schedule. Exact dates and further key dates will need to be agreed between the Supplier and other T Level Awarding Organisations through Schedule 4 (*Co-operation*) and the resulting Key Dates Schedule must be Approved by the Authority.

Key Date	Description	Assessment series
3rd week August	Release of more detailed TQ results data from the Supplier	June
3rd week September	Appeals and assessment review requests made	June
4th week Nov	T Level certificates and statements of achievement issued by the Department (or the function may be delegated to the Authority)	All

ANNEX 6 – TQ CONTENT UPDATING SCHEDULE

TQ Content Updating Schedule: Inclusive TQ Changes

Schedule Date	Activity
By end November (Academic Year X[10]-1)	Where the Authority carries out an annual review contemplated by clause 8.4, the Authority shall (where the Authority considers that the outcome of that review gives rise to any one or more Inclusive TQ Changes that the Authority requires to be implemented in accordance with this TQ Content Updating Schedule) submit to the Supplier an annual guidance note setting out such Inclusive TQ Changes.
December to February (Academic Year X-1)	The Supplier shall reflect any Inclusive TQ Changes arising out of the relevant annual guidance note (and any additional updates the Supplier proposes should be included as part of the annual review) in the Approved Initial TQ Deliverables or the TQ Deliverables (as the case may be) and/or any other Products and/or documents associated with the TQ (as applicable).
By end February (Academic Year X-1)	The Supplier shall submit the relevant Approved Initial TQ Deliverables, TQ Deliverables, Products and/or documents (as the case may be) as amended to reflect the Inclusive TQ Changes in question to the Authority for agreement.
March (Academic Year X-1)	(a) The Authority shall either: • confirm to the Supplier its agreement to the relevant amended Approved Initial TQ Deliverables, TQ Deliverables, Products and/or documents; or • notify the Supplier that the whole or part of such amended Approved Initial TQ Deliverables, TQ Deliverables, Products and/or documents are not agreed (and provide details of the comments and/or objections that the Authority has in relation to such documents). (b) The Supplier shall (as soon as reasonably practicable following receipt of the Authority's notice) make such amendments to the whole or relevant part (as the case may be) of the Approved Initial TQ Deliverables, TQ Deliverables, Products and/or documents as are necessary to address any comments and/or objections

[10] Where Academic Year X shall be the Academic Year in which the agreed amended documents reflecting the relevant Inclusive TQ Changes shall (where applicable) be implemented by Approved Providers for the new Cohort of Students.

	of the Authority and resubmit such amended documents to the Authority for agreement, to which the provisions of paragraph (a) (immediately above) shall apply.
The earlier of the end of March (Academic Year X-1) and (where applicable) the date of agreement by the Authority to the relevant amended documents	The Supplier shall make available any agreed amended Approved Initial TQ Deliverables or TQ Deliverables and (where applicable) any Products and/or documents to Approved Providers and facilitate the implementation by Approved Providers of such amended Approved Initial TQ Deliverables, TQ Deliverables, Products and/or documents, provided always that where part of any such amended document is subject to further amendment (as required by the Authority pursuant to paragraph (a) above), the Supplier shall not (unless otherwise agreed with the Authority) make any part of that relevant Approved Initial TQ Deliverable, TQ Deliverable, Product or document available to Approved Providers until the Supplier has made such amendments as are necessary to address the comments and/or objections of the Authority referred to in paragraph (a) above and the Authority has either confirmed its agreement to the resubmitted document or notified the Supplier that such document (containing only those amendments that have been agreed by the Authority) may be made available to Approved Providers.
September (Academic Year X)	Any agreed amended Approved Initial TQ Deliverables or TQ Deliverables and (where applicable) any Products and/or documents shall be implemented by Approved Providers for the new Cohort of Students.

TQ Content Updating Schedule: Exclusive TQ Changes

Schedule Date	**Activity**
End May (Academic Year X[11]-2)	Where the Authority carries out an annual review contemplated by clause 8.4, the Authority shall (where the Authority considers that the outcome of that review gives rise to any one or more Exclusive TQ Changes that the Authority requires to be implemented in accordance with this TQ Content Updating Schedule) submit to the Supplier an annual guidance note setting out such Exclusive TQ Changes.
June (Academic Year X-2) to September (Academic Year X-1)	The Supplier shall reflect any Exclusive TQ Changes arising out of the relevant annual guidance note in the Approved Initial TQ Deliverables or the TQ Deliverables (as the case may be) and/or any other Products and/or documents associated with the TQ (as applicable).

[11] Where Academic Year X shall be the Academic Year in which the agreed amended documents reflecting the relevant Exclusive TQ Changes shall (where applicable) be implemented by Approved Providers for the new Cohort of Students.

By End September (Academic Year X-1)	The Supplier shall submit the relevant Approved Initial TQ Deliverables, TQ Deliverables, Products and/or documents (as the case may be) as amended to reflect the Exclusive TQ Changes in question to the Authority for IfATE Approval.
October to November (Academic Year X-1)	(a) The Authority shall either: • confirm to the Supplier that the relevant amended Approved Initial TQ Deliverables, TQ Deliverables, Products and/or documents meet the requirements for IfATE Approval; or • notify the Supplier that the whole or part of such amended Approved Initial TQ Deliverables, TQ Deliverables, Products and/or documents do not meet the requirements for IfATE Approval (and provide details of the comments and/or objections that the Authority has in relation to such documents). (b) The Supplier shall (as soon as reasonably practicable following receipt of the Authority's notice) make such amendments to the whole or relevant part (as the case may be) of the Approved Initial TQ Deliverables, TQ Deliverables, Products and/or documents as are necessary to address any comments and/or objections of the Authority and resubmit such amended documents to the Authority for IfATE Approval, to which the provisions of paragraph (a) (immediately above) shall apply.
The earlier of the beginning of December (Academic Year X-1) and (where applicable) the date of IfATE Approval being achieved in relation to the relevant amended documents	The Supplier shall make available any amended Approved Initial TQ Deliverables or TQ Deliverables and (where applicable) any Products and/or documents that have achieved IfATE Approval to Approved Providers and facilitate the implementation by Approved Providers of such amended Approved Initial TQ Deliverables, TQ Deliverables, Products and/or documents, provided always that where part of any such amended document is subject to further amendment (as required by the Authority pursuant to paragraph (a) above), the Supplier shall not (unless otherwise agreed with the Authority) make any part of that relevant Approved Initial TQ Deliverable, TQ Deliverable, Product or document available to Approved Providers until the Supplier has made such amendments as are necessary to address the comments and/or objections of the Authority referred to in paragraph (a) above and the Authority has either confirmed that such amended resubmitted document has achieved IfATE Approval or notified the Supplier that such document (containing only those amendments on which the Authority would be prepared to award IfATE Approval) may be made available to Approved Providers.

September (Academic Year X)	Any amended Approved Initial TQ Deliverables or TQ Deliverables and (where applicable) any Products and/or documents that have achieved IfATE Approval shall be implemented by Approved Providers for the new Cohort of Students.

ANNEX 7 – INITIAL DEVELOPMENT MILESTONES

This Annex sets out the submission requirements for the three Milestones at which the Authority will render initial, interim and final payments of the Development Charge.

Further interim submission Milestones may be added to this timetable where these are agreed as part of the agreement at Interim Milestone 1. This decision will be influenced by the quantum of change to the TQ that is approved by the Authority at that initial Milestone.

In the event of any conflict and/or inconsistency between the provisions of this Annex 7 and the provisions of Annex 4 (*TQ Critical Path Diagram*) to this Service Requirements, the provisions of this Annex 7 shall prevail.

Milestone	**Submission Date**	**Submission**
Interim Milestone 1	3 February 2025 (indicative)	**TQ Specification.** A draft version of the complete TQ Specification, which takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier in respect of the Supplier's Response and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting, and which includes: (a) a complete Specification of Content for all Components which fully covers the Former Supplier's TQ Specification and, if relevant, the Outline Content and any proposed changes to the Former Supplier's Specification of Content; (b) the proposed Guided Learning hours for each Component; (c) a draft of the Scheme of Assessment which: (i) specifies the assessment objectives for each part of the TQ Core Component;

Milestone	Submission Date	Submission
		(ii) defines each assessment method to be used for each Component; (iii) specifies indicative weightings for the assessments within the Components. **TQ Specimen Assessment Materials.** Sample indicative assessment tasks, and assessment criteria/mark schemes which takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier in respect of the Supplier's Response and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting for: (d) each part of the TQ Core Component; and (e) at least one Occupational Specialist Component. The submission must support the exemplification of the proposals within the assessment design walkthrough and include as a minimum the following: (f) exemplar questions that cover the variety of questions types and accompanying mark scheme including indicative content; (g) exemplar tasks for one example of an Employer Set Project together with an exemplar mark scheme and indicative content; and (h) exemplar tasks for one Occupational Specialist Component Assignment together with an exemplar mark scheme including indicative content. **Assessment Strategy.** A draft of the Assessment Strategy, which contains a clear explanation of the structure of the assessment design and strategy for example, the

Milestone	Submission Date	Submission
		proposed number of assessments and/or assessment tasks, the duration of each and the conditions under which each would be taken. For the Employer Set Project and the Occupational Specialisms, the draft of the Assessment Strategy should also set out the proposed approach to marking and how students' application of skills and knowledge will be assessed. The draft of the Assessment Strategy shall meet (so far as is reasonably practicable having regard to the timing of Interim Milestone 1) all of the requirements of the Product Description for the Assessment Strategy and take into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier in respect of the Supplier's Response and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. The Submission must include an: **Assessment design slide deck.** A slide deck which contains a clear explanation of the structure of the assessment design and explanation of the design decision rationale for the TQ Core Component and Occupational Specialist Component. The slide deck must contain the structural elements and rationale in accordance with any guidance on the Service Requirements issued by the Authority and take into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier in respect of the Supplier's Response and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. The assessment design slide deck will be used to facilitate a walkthrough with the Authority shortly following the submission. **Implementation and Delivery Plan.** A complete version of the Implementation and Delivery Plan, which meets (so far as is reasonably practicable having regard to the timing of Interim Milestone 1) all of the requirements of the Product Description for the Implementation and Delivery Plan and which also takes in account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier in respect of the Supplier's Response and/or arising out of or in connection with the submission of such Product at any

Milestone	Submission Date	Submission
		previous TQ Development Meeting **Resource Plan.** A complete version of the Resource Plan, which meets (so far as is reasonably practicable having regard to the timing of Interim Milestone 1) all of the requirements of the Product Description for the Resource Plan and which also takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier in respect of the Supplier's Response and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. **Provider Approval Criteria.** A complete version of the Provider Approval Criteria, which meets (so far as is reasonably practicable having regard to the timing of Interim Milestone 1) all of the requirements of the Product Description for the Provider Approval Criteria and which also takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier in respect of the Supplier's Response and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. **Risk Register and Issues Log.** An updated and complete version of each of the Risk Register and the Issues Log which meet all of the requirements of the Product Description for the Risk Register or Issues Log (as applicable) and which take into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier in respect of the Supplier's Response and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. **Submission Issues Log.** An updated Submission Issues Log which meets all of the requirements of the Product Description for the Submission Issues Log, and which explains how each issue raised by the Authority to date has been dealt with in this Submission. **Employer and Provider Engagement Strategy.** A complete version of the Employer and

Milestone	Submission Date	Submission
		Provider Engagement Strategy, which meets (so far as is reasonably practicable having regard to the timing of Interim Milestone 1) all of the requirements of the Product Description for the Employer and Provider Engagement Strategy and which also takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier in respect of the Supplier's Response and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting.
Interim Milestone 2	2 June 2025 (indicative)	**TQ Specification.** A complete version of the TQ Specification, which meets all of the requirements of the Product Description for the TQ Specification and which also takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at Interim Milestone 1 and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. **TQ Specimen Assessment Materials and accompanying Assessment Guidance for Providers.** A complete version of the TQ Occupational Specialist Component and each part of the TQ Core Component, and accompanying Assessment Guidance for Providers which meet all of the requirements of the Product Descriptions and which also take into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at Interim Milestone 1 and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. **Assessment Strategy.** A complete version of the Assessment Strategy, which meets all of the requirements of the Product Description for the Assessment Strategy and which also takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at Interim Milestone 1 and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting.

Milestone	Submission Date	Submission
		Implementation and Delivery Plan. A complete version of the Implementation and Delivery Plan, which meets all of the requirements of the Product Description for the Implementation and Delivery Plan and which also takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at Interim Milestone 1 and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. **Resource Plan.** A complete version of the Resource Plan, which meets all of the requirements of the Product Description for the Resource Plan and which also takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at Interim Milestone 1 and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. **Provider Approval Criteria.** A complete version of the Provider Approval Criteria which meets (so far as is reasonably practicable having regard to the timing of Interim Milestone 4) all of the requirements of the Product Description for the Provider Approval Criteria and which also takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at Interim Milestone 1 and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. **Risk Register and Issues Log.** A complete version of each of the Risk Register and the Issues Log which meet all of the requirements of the Product Description for the Risk Register or Issues Log (as applicable) and which also take into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at Interim Milestone 1 and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. **Submission Issues Log.** An updated Submission Issues Log which meets all of the

Milestone	Submission Date	Submission
		requirements of the Product Description for the Submission Issues Log, and which explains how each issue raised by the Authority to date has been dealt with in this Submission. **Employer and Provider Engagement Strategy.** A complete version of the Employer and Provider Engagement Strategy, which meets all of the requirements of the Product Description for the Employer and Provider Engagement Strategy and which also takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at Interim Milestone 1 and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting.
Final Approval Milestone	22 September 2025 (indicative)	**TQ Specification**. A complete version of the TQ Specification, which meets all of the requirements of the Product Description for the TQ Specification and which also takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at any previous Interim Milestone and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. **TQ Specimen Assessment Materials and accompanying Assessment Guidance for Providers.** A complete version of the TQ Specimen Assessment Materials, and accompanying Assessment Guidance for Providers which meet all of the requirements of the Product Descriptions and which also take into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at any previous Interim Milestone and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. **Assessment Strategy.** A complete version of the Assessment Strategy, which meets all of the requirements of the Product Description for the Assessment Strategy and which also

Milestone	Submission Date	Submission
		takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at any previous Interim Milestone and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. **Implementation and Delivery Plan.** A complete version of the Implementation and Delivery Plan, which meets all of the requirements of the Product Description for the Implementation and Delivery Plan and which also takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at any previous Interim Milestone and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. **Resource Plan.** A complete version of the Resource Plan, which meets all of the requirements of the Product Description for the Resource Plan and which also takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at any previous Interim Milestone and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. **Provider Approval Criteria**. A complete version of the Provider Approval Criteria, which meets all of the requirements of the Product Description for the Provider Approval Criteria and which also takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at any previous Interim Milestone and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. **Risk Register and Issues Log.** A complete version of each of the Risk Register and the Issues Log which meet all of the requirements of the Product Description for the Risk Register or Issues Log (as applicable) and which also take into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at any previous Interim Milestone and/or arising out of or in connection with the submission of

Milestone	Submission Date	Submission
		such Product at any previous TQ Development Meeting. **Submission Issues Log.** An updated Submission Issues Log which meets all of the requirements of the Product Description for the Submission Issues Log, and which explains how each issue raised by the Authority to date has been dealt with in this Submission. **Employer and Provider Engagement Strategy.** A complete version of the Employer and Provider Engagement Strategy, which meets all of the requirements of the Product Description for the Employer and Provider Engagement Strategy and which also takes into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at any previous Interim Milestone and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting. **Draft Key Dates Schedule.** An updated version of the Key Dates Schedule.
Guide Standard Exemplification Materials	October 2025 (Indicative)	**Exemplification Materials.** A complete version of the Guide Standard Exemplification Materials for each Occupational Specialist Component, which meet all of the requirements of the Product Description for the Guide Standard Exemplification Materials and which also take into account any comments, objections, recommendations and/or requirements notified by the Authority to the Supplier at any Milestone and/or arising out of or in connection with the submission of such Product at any previous TQ Development Meeting or any other feedback.

ANNEX 8 – ELIGIBLE PROVIDERS

Part 1 – Eligible Providers

The Eligible Providers for the current Academic Year are published on the Gov.uk website here:
https://www.gov.uk/government/publications/providers-selected-to-deliver-t-levels

Part 2 – Eligible Providers Subsequent Cohorts

The Authority shall, not later than 12 months prior to the commencement of the relevant Academic Year, notify the Supplier of the Eligible Providers for such Academic Year.

ANNEX 9 – MANAGEMENT INFORMATION

Information/ report	Description
Development Phase Report	In the period prior to IfATE Approval, the Supplier shall prepare and provide a dashboard report (in such form as the Authority may specify from time to time) summarising: • the Supplier's progress against and compliance (to date) with the Implementation and Delivery Plan (including progress against any milestones (including any Milestones)) and the Resource Plan; • how the Supplier is managing any risks and issues identified in the updated Risk Register and/or Issues Log, including the Supplier's progress against any steps required by the Authority to be carried out by the Supplier in accordance with paragraph 11.1.2 of Part 1 of this Service Requirements; • how Employers (and other end users, including higher education providers) have been consulted in relation to the design of the TQ; and • such other information as the Authority may reasonably require from time to time.

Operational Delivery Report	**Monthly Performance Report**
	
	The Supplier shall prepare and provide a dashboard report (in such form as the Authority may specify from time to time) summarising:
	
	• the Supplier's progress against and compliance (to date) with the Implementation and Delivery Plan, the Resource Plan and the Key Dates Schedule for the relevant Academic Year;
	• how the Supplier is managing any risks and issues identified in the updated Risk Register and/or Issues Log, including the Supplier's progress against any steps required by the Authority to be carried out by the Supplier in accordance with paragraph 11.1.2 of Part 1 of this Service Requirements;
	• for each KPI in respect of which the Performance Monitoring Period ends in that Contract Month:
	  ○ the actual performance achieved by the Supplier for that KPI during that Performance Monitoring Period; and
	  ○ details of any Service Failure that occurred in respect of that KPI, together with the proposed KPI Improvement Plan;

Information/ report	Description
	• details of the Supplier's progress against each KPI Improvement Plan that the Supplier is (or should be, if it was complying with its obligations under this Contract) carrying out and/or completing during the relevant Contract Month; • the Supplier's progress in carrying out any Designated Action notified by the Authority pursuant to clause 14.2 (*What may happen if there are issues with your provision of the Services*); • without prejudice to clause 14.1 (*What may happen if there are issues with your provision of the Services*), any Critical Service Failures occurring in the relevant Contract Month; • any areas of the Services (and/or the performance of the Services) where the Supplier reasonably considers that there could be innovations and/or improvements in the delivery and/or performance of the Services, including key risks and potential benefits; • progress in implementing, and the actual impact of, any innovations and/or improvements previously notified by the Supplier; • evidence demonstrating that the Supplier is achieving the overarching outcomes for each element of the Services, as set out in the first column of the Service Definitions Table; • the monitoring undertaken by the Supplier in accordance with paragraph 3.1.2 of Part 1 of this Service Requirements in the relevant Contract Month to include reporting on Provider usage of training, resources and other support materials made available by the Supplier; • any events, matters and/or circumstances referred to in paragraph 3.2 of Part 1 of this Service Requirements occurring in the relevant Contract Month, together with the progress (during the relevant Contract Month) of the Eligible Provider or Approved Provider (as the case may be) and the Supplier in taking the steps and/or actions referred to in paragraphs 3.3 and 3.4 of Part 1 of this Service Requirements; and • such other information as the Authority may reasonably require from time to time having regard to, amongst other things, the period in the Academic Year within which the relevant Contract Month falls. In relation to the assessment of the Supplier's performance against each KPI, the Supplier shall submit all such evidence as is referred to in the fifth column of the Table set out in Annex 1 to Schedule 15 (*Monitoring of Performance*), other than where such evidence is stated to be obtained via a survey. Notwithstanding the evidence that the Supplier is required to provide (referred to in the fifth column of the Table set out in Annex 1 to Schedule 15 (*Monitoring of Performance*)) to enable

Information/ report	Description
	the assessment of the Supplier's performance against each KPI, the Supplier shall also include within this Monthly Performance Report the following data and information (broken down by KPI): • KPI 1 (Provider approval and monitoring): o the number of Eligible Providers applying to become Approved Providers, broken down into those Eligible Providers that are seeking a full approval and those Eligible Providers that are seeking to extend an existing approval; o the number and details of Eligible Providers that have submitted an application to become an Approved Provider and who have (i) not become an Approved Provider and (ii) become an Approved Provider; o the number and details of Eligible Providers that are awaiting a decision on their application to become an Approved Provider; o the number and details of Eligible Providers in respect of which a decision has been made within 30 Working Days of receipt by the Supplier of the relevant application; and o details of the actual monitoring of Approved Providers undertaken by the Supplier in the relevant Contract Month. • KPI 2 (Approved Provider preparedness).[12] • KPI 3 (Queries from Eligible Providers and Approved Providers): o the number of letters and other forms of electronic correspondence received (broken down by letter and each other form of electronic correspondence) and number of telephone calls received, in each case, in the relevant Contract Month; o a summary of key topics or queries being asked; o details of the percentage of such queries being resolved within the Target Service Level (broken down by letter (and each other form of electronic correspondence) and telephone calls); and o details of any repeat queries (including where any such queries have been raised and/or resolved in any previous Contract Month). • KPI 4 (Complaints): o the number of complaints received in the relevant Contract Month; o a summary of the nature of each such complaint; o details of the percentage of such complaints being resolved within the applicable Target Service Level;

[12] To be measured by a survey undertaken or commissioned by the Authority.

Information/ report	Description
	○ details of why any complaints that have not been resolved within the applicable Target Service Level have not been so resolved; and ○ details of any repeat complaints or further complaints linked to a previous complaint (including where any such complaints have been made and/or resolved in any previous Contract Month). • KPI 5 (Provider satisfaction).[13] • KPI 6 (Numbers of appropriately qualified and trained Assessors (and (where applicable) Moderators)): ○ details of the actual number of Assessors (and (where applicable) Moderators) that have been recruited, trained and retained in the relevant Contract Month; and ○ details of the number of Assessors (and (where applicable) Moderators) contemplated by the relevant Contract Month (or in line with the trajectory (as the case may be)) as set out in the then current Implementation and Delivery Plan and/or Resource Plan. The Authority may require the Supplier to provide this data more frequently than monthly during the key assessment delivery period. • KPI 7 (Quality of TQ Live Assessment Materials): ○ a summary of activities completed in the relevant Contract Month relating to the development of the TQ Live Assessment Materials, as contemplated in the Assessment Strategy and/or the Implementation Plan; ○ a summary of the actual quality assurance activity undertaken by the Supplier in the relevant Contract Month; ○ a summary of the quality assurance activity (if any) that is contemplated in the Assessment Strategy as being undertaken by the Supplier in or during (as the case may be) the relevant Contract Month; and ○ details of any errors reported in the TQ Live Assessment Materials in the relevant Contract Month. • KPI 8 (Student assessment evidence assessed and processed): ○ a summary of the actual quality assurance activity undertaken by the Supplier to verify the quality of the processing of Student assessment evidence for awarding in the relevant Contract Month, together with evidence that such

[13] To be measured by a survey undertaken or commissioned by the Authority.

Information/ report	Description
	processing has been undertaken accurately and consistently; o a summary of the quality assurance activity (if any) that is contemplated in the Assessment Strategy as being undertaken by the Supplier to verify the quality of the processing of Student assessment evidence for awarding in or during (as the case may be) the relevant Contract Month; o details of the cumulative volume and percentages of Student assessment evidence processed (broken down to the TQ Core Component and each Occupational Specialist Component) by the end of the relevant Contract Month, as against the planned trajectory and dates in the Implementation and Delivery Plan applicable to that Contract Month; and o details of any errors, inaccuracies and/or inconsistencies identified in any processed Student assessment evidence in the relevant Contract Month. • KPI 9 (Validation of Grade Standard Exemplification Materials):[14] For each Occupational Specialism: o a summary of the employer validation activity undertaken to validate Grade Standard Exemplification Materials o the number of employers who have been involved in the validation process; including details as to whether they have been involved in the panel prior to each validation exercise o evidence of validation from at least 5 different Employers relevant to the Occupational Specialism that validate the Grade Standard Exemplification Materials. o evidence of validation from at least 5 different Employers relevant to the Occupational Specialism that the Grade Standard Exemplification Materials are comparable to the Approved Guide Standard Exemplification Materials. • KPI 10 (Student assessment results submitted by relevant date): o details of the cumulative volume and percentages of Student results submitted by the Supplier to the Authority (or the Authority's nominee (as applicable)) by the end of the relevant Contract Month; and

[14] To be assessed by the receipt and review by the Authority of evidence of validation from Employers in the relevant Contract Month.

Information/ report	Description
	○ details of the cumulative volume and percentages of Student results envisaged in the Implementation and Delivery Plan to be submitted by the Supplier to the Authority (or the Authority's nominee (as the case may be)) by the end of the relevant Contract Month. • KPI 11 (Post-Results Services): ○ the total volume of Post-Results Services (broken down by service) and percentage of each Post-Results Service (as against total Post-Results Services) undertaken by the Supplier in the relevant Contract Month; ○ detail of the timing of delivery of Post-Results Services against the applicable timeframes in Annex 10 (*Additional Services*) of this Service Requirements as contemplated by the Supplier's Response; and ○ detail of the proportion of remarks and Appeals which have resulted in grade increases or decreases (and summary of key reasons for any changes made). • KPI 12 (Submission of information): ○ details of the Management Information, required or requested Products including Key Materials and/ or Ancillary Materials submitted in respect of the relevant Contract Month; ○ details of the Management Information, required or requested Products including Key Materials and/ or Ancillary Materials anticipated to be submitted in respect of the relevant Contract Month; and ○ details of any errors, inaccuracies and/or inconsistencies identified in any Management Information, required or requested Products including Key Materials and/ or Ancillary Materials submitted in respect of the relevant Contract Month (and/or any previous Contract Month). **Ongoing Development Services Report** A dashboard report (in such form as the Authority may specify from time to time) summarising: • the Supplier's progress against and compliance (to date) with the TQ Content Updating Schedule (including progress against any milestones); • any proposed amendments and/or updates made to any Product during the relevant Contract Month pursuant to paragraphs 2.5 and/or 2.6 of Part 1 of this Service Requirements; and

Information/ report	Description
	• such other information as the Authority may reasonably require from time to time. **Annual Services Report** By the end of August each year, a high level overview of the Supplier's assessment of its performance during that Academic Year, summarising: • the key successes and areas for improvement in the delivery of the Services and/or the TQ; • in respect of the assessment cycles in that Academic Year, what important lessons were learned and how these will be addressed in following assessment cycles; • the key issues for the next following Academic Year; • how Employers have been consulted in relation to (and been involved in the design and delivery of) TQ assessment; • performance against the Social Value commitments under paragraph 13.1 (*Social Value Commitments*); and • (where appropriate), the preparations for handover at the end of the Term. The Supplier shall also provide an updated Exit Plan in accordance with paragraph 2 of Schedule 12 (*Exit Management*). **Annual Penetration Testing Report** By the end of August each year, a summary of: • the Supplier's findings of independent penetration testing undertaken to test the security of any IT systems and hosting environments that are used to handle, store or process IfATE Data; and • details of any necessary remedial works required as a result of such penetration testing.
Student registrations and Student entries (as referred to in paragraph 5 of Part 1 of this Service Requirements)	In relation to the Supplier's obligations in paragraph 5.4 of Part 1 of this Service Requirements, the Supplier shall report the following information and data (in a spreadsheet but in such form as the Authority may specify from time to time): • the number of Students registered for the TQ by Approved Provider (including late registrations and/or registration amendments and very late registrations and/or registration amendments (each as referred to in Annex 10 to this Service Requirements)):

Information/ report	Description
	○ in the current Academic Year; and ○ in aggregate (including for the current Academic Year) during the Term to date; • the number of Student entries by Approved Provider (including late entries and/or entry amendments and very late entries and/or entry amendments (each as referred to in Annex 10 to this Service Requirement)) in the relevant Academic Year for: ○ the TQ Core Component; and ○ each Occupational Specialist Component, together with the number of such entries in aggregate (including for the current Academic Year) for each of the TQ Core Component and each Occupational Specialist Component for all Academic Years during the Term to date; • the number of withdrawn entries in the relevant Academic Year (by Approved Provider) for: ○ the TQ Core Component; and ○ each Occupational Specialist Component, together with the number of such withdrawals in aggregate (including for the current Academic Year) for each of the TQ Core Component and each Occupational Specialist Component for all Academic Years during the Term to date; and • such other information as the Authority may reasonably require from time to time.
TQ results (as referred to in paragraph 8 of Part 1 of this Service Requirements)	In relation to the Supplier's obligations in paragraph 8.2 of Part 1 of this Service Requirements, the Supplier shall report the following information and data (in such form as the Authority may specify from time to time) to the Authority (or the Authority's nominee (as applicable)): • results for each Student for the TQ Core Component and each Occupational Specialist Component that such Student has undertaken including: ○ Unique Learner Number; ○ name of Approved Provider; ○ Supplier name; ○ details of the TQ achieved; ○ the grade awarded for each Component; ○ date of achievement; • the outcome of any Appeals, Clerical Check, Expedited Review of Marking, Review of Marking, and/or Review of Moderation (each as referred to in Annex 10 (*Additional Services*) to this Service Requirements)), including

Information/ report	Description
	details of the nature of the Appeal and a summary of the grounds for the Appeal; and • such other information as the Authority may reasonably require from time to time, to enable, amongst other things, the aggregation for T Level certification and inclusion in any Provider performance tables.
Additional Services	Data and information on the volume and nature of Additional Services being delivered to Approved Providers in the relevant Contract Month, in aggregate for the Academic Year to date and in aggregate (including for the current Academic Year) for all Academic Years during the Term to date (in spreadsheet format and in such form as the Authority may specify from time to time).
Adjustments to Fees	In advance of its publication and availability to Approved Providers and in accordance with clause 4.13 (*Pricing and payments*), proposed adjustments to the Fees for the following Academic Year. In accordance with clause 4.13 (*Pricing and payments*), proposed adjustments to the Rate Card for the following Academic Year. The information for each of the proposed adjustments to the Fees and the proposed adjustments to the Rate Card will be submitted separately in a spreadsheet format (in such form as the Authority may specify from time to time) and will include any proposed annual percentage change in each proposed Fee and each proposed rate in the Rate Card, as such proposed change shall be calculated in accordance with clauses 4.12 and 4.13 (*Pricing and payments*).

ANNEX 10 – ADDITIONAL SERVICES

Additional Service	Additional Service Requirements
Access to Student assessment evidence	The Supplier shall within 10 Working Days following receipt of a request from the relevant Approved Provider, send (in such form as such Approved Provider shall request) to that Approved Provider a copy (including, as applicable, a PDF copy) of the relevant original marked Student assessment evidence or the whole or the relevant part (as the case may be) of the original TQ Live Assessment Materials to which the Student assessment evidence relates, to help the Approved Provider (or relevant Student (as the case may be)) decide whether to request a Review of Marking or Review of Moderation (each as defined below).
Additional Approved Provider support visit	The Supplier shall, as soon as reasonably practicable following receipt of a request from an Approved Provider, attend such Approved Provider's premises and provide such additional support as such Approved Provider reasonably requires, such as support in relation to misinterpretation of the TQ Specification.
Appeal	The Supplier shall: (i) within 20 Working Days following receipt of a request from an Approved Provider for an Appeal, undertake a detailed review of all information, data and/or documents relating to the Appeal, including the assessment evidence relating to the whole or the relevant part of a Cohort or an individual Student (as the case may be); and (ii) within 20 Working Days following receipt of a request from an Approved Provider for an Appeal hearing, hold an Appeal hearing in which the Approved Provider or its representative(s) can make submissions in relation to the Appeal, including (where applicable) explaining its dissatisfaction with any grade(s) awarded in relation to the whole or any part of a Cohort or an individual Student (as the case may be), following which the Supplier shall notify the Approved Provider of the outcome of such Appeal and, where necessary, adjust the marks awarded to the whole or any part of a Cohort or an individual Student (as the case may be) and issue new results to the Authority (or its nominee (as the case may be)), provided always that this Additional Service shall only be deemed to be an Additional Service in respect of which a Fee shall be payable by the Approved Provider if, following the determination of such Appeal, the Approved Provider is not successful in the Appeal.
Clerical Check	The Supplier within 10 Working Days following receipt of a request from an Approved Provider, undertake a detailed review of the relevant Student's assessment evidence and recount all of

Additional Service	Additional Service Requirements
	the marks that such Student has been awarded to ensure that the total number of marks awarded to such Student (leading to the award of the relevant grade(s)) equal the number of marks that should have been awarded to such Student and, where necessary, adjust the marks awarded to the Student, notify the Approved Provider of such adjustment and issue new results to the Authority (or its nominee (as the case may be)).
Expedited Review of Marking	The Supplier shall within 10 Working Days following receipt of a request from an Approved Provider, undertake an expedited Review of Marking (as defined below), provided always that this Additional Service shall only be deemed to be an Additional Service in respect of which a Fee shall be payable by the Approved Provider if, following the carrying out and completion of such an expedited Review of Marking, the grade(s) awarded to such Student is not changed.
Late entry or entry amendment	Where, following the entry deadline for the TQ Core Component and/or relevant Occupational Specialist Component specified in the Key Dates Schedule for the relevant Academic Year until the very late entry deadline for the TQ Core Component and/or relevant Occupational Specialist Component specified in the Key Dates Schedule for the relevant Academic Year, an Approved Provider requires a new Student to be entered for the TQ Core Component and/or relevant Occupational Specialist Component and/or an existing entry for a Student to be amended, the Supplier shall following receipt of a request from an Approved Provider no later than 20 Working Days prior to the commencement of the relevant assessment as determined in accordance with the relevant Key Dates Schedule, enter that Student for the TQ Core Component and/or relevant Occupational Specialist Component or amend that Student's entry for the TQ Core Component and/or relevant Occupational Specialist Component (as the case may be).
Late registration or registration amendment	Where, following the registration deadline for the TQ specified in the Key Dates Schedule for the relevant Academic Year until the very late registration deadline for the TQ specified in the Key Dates Schedule for the relevant Academic Year, an Approved Provider requires a new Student to be registered for the TQ and/or an existing registration for a Student to be amended, the Supplier shall following receipt of a request from an Approved Provider no later than 20 Working Days prior to the commencement of the relevant assessment as determined in accordance with the relevant Key Dates Schedule, register that Student for the TQ or amend that Student's registration for the TQ (as the case may be).
Retake	Where, in the period following the publication of the TQ results in accordance with paragraph 8 of Part 1 of this Service Requirements until two years after the end of the final Academic Year for the Cohort within which the relevant Student is included,

Additional Service	Additional Service Requirements
	an Approved Provider requests that a Student wishes to retake all or any of the assessments for: • the TQ Core Component - External Examination; • the TQ Core Component - Employer Set Project; and/or • an Occupational Specialist Component, the Supplier shall carry out and complete its obligations in paragraphs 6.1.3 (*TQ live assessment design and delivery*), 7 (*TQ grade awarding*), 8 (*TQ Results*) and 9 (*TQ Post Results Services*) (save to the extent that compliance with such obligations in that paragraph 9 (*TQ Post Results Services*) would otherwise require the performance of a further Additional Service and in respect of which the provisions applicable to that further Additional Service shall apply) in each case of Part 1 of this Service Requirements in respect of such Student.
Review of Marking	The Supplier shall within 25 Working Days following receipt of a request from an Approved Provider, undertake a detailed review of the relevant Student's assessment evidence alongside the TQ Live Assessment Materials applicable to such assessment evidence to ensure that the marking scheme has been complied with in full in relation to the marking of that Student's assessment evidence, provided always that this Additional Service shall only be deemed to be an Additional Service in respect of which a Fee shall be payable by the Approved Provider if, following the carrying out and completion of such review, the grade(s) awarded to such Student is not changed.
Review of Moderation	The Supplier shall within 25 Working Days following receipt of a request from an Approved Provider, undertake a detailed review of the relevant Cohort's assessment evidence alongside the assessment criteria within the Scheme of Assessment to ensure that the assessment criteria has been complied with in full in relation to the marking of that Cohort's assessment evidence, provided always that this Additional Service shall only be deemed to be an Additional Service in respect of which a Fee shall be payable by the Approved Provider if, following the carrying out and completion of such Review of Moderation, the grade(s) awarded to any Student is not changed.
Very late entry or entry amendment	Where, following the very late entry deadline for the TQ Core Component and/or relevant Occupational Specialist Component specified in the Key Dates Schedule for the relevant Academic Year until the date on which entries or amendments to entries finally closes for the TQ Core Component and/or relevant Occupational Specialist Component as specified in the Key Dates Schedule for the relevant Academic Year, an Approved Provider requires a new Student to be entered for the TQ Core Component and/or relevant Occupational Specialist Component and/or an existing entry for a Student to be amended, the Supplier shall (where reasonably practicable having regard to the nature of the assessment) following receipt of a request from an Approved

Additional Service	Additional Service Requirements
	Provider within the period not greater than 20 Working Days prior to the commencement of the relevant assessment as determined in accordance with the relevant Key Dates Schedule, enter that Student for the TQ Core Component and/or relevant Occupational Specialist Component or amend that Student's entry for the TQ Core Component and/or relevant Occupational Specialist Component (as the case may be).
Very late registration or registration amendment	Where, following the very late registration deadline for the TQ specified in the Key Dates Schedule for the relevant Academic Year until the date on which registration for the TQ finally closes as specified in the Key Dates Schedule for the relevant Academic Year, an Approved Provider requires a new Student to be registered for the TQ and/or an existing registration for a Student to be amended, the Supplier shall (where reasonably practicable having regard to the nature of the assessment), following receipt of a request from an Approved Provider within the period not greater than 20 Working Days prior to the commencement of the relevant assessment as determined in accordance with the relevant Key Dates Schedule, register that Student for the TQ or amend that Student's registration for the TQ (as the case may be).

ANNEX 11 –

Schedule for the submission of; Supplementary Specimen Assessment Materials; Employer Set Project Guide Exemplar Responses; and Employer Set Project Grade Exemplar Responses

Product	Description	Authority Submission Date	Publication date	Review point
Core Component	Supplementary Specimen Assessment Materials covering the TQ Core Component in full (comprising the External Examination and the Employer Set Project).	By the end of August prior to the first Academic Year of teaching	By end of October during the first Academic Year	Commencing during the second Academic Year of teaching, to be reviewed by the Supplier each and every Academic Year and re-submitted to the Authority to agree any changes by the end of October, for re-publication by the end of December.
Occupational Specialist Component(s)	Supplementary Specimen Assessment Materials covering the Occupational Specialist Component(s) in full.	By the end of March during the first Academic Year of teaching	By end of July during the first Academic Year	Commencing during the second Academic Year of teaching, to be reviewed by the Supplier each and every Academic Year and re-submitted to the Authority to agree any changes by the end of July, for re-publication by the end of October in the following Academic Year.
Employer Set Project Guide Exemplar Responses	Employer Set Project Guide Exemplar Responses covering the Employer Set Project, produced at grade A and grade E for each Employer Set Project, in consultation with Employers and accompanied by an explanatory commentary.	By the end of August prior to the first Academic Year of teaching	By end of October during the first Academic Year	
Employer Set Project Grade Exemplar Responses	Employer Set Project Grade Exemplar Responses covering the Employer Set Project, consisting of actual marked examples of Students' assessment evidence, selected after awarding, produced at grade A and grade E, for each Employer	By the end of October during the second Academic Year of teaching	By end of December during the second Academic Year	Commencing during the third Academic Year of teaching, to be reviewed by the Supplier each and every Academic Year and re-submitted to the Authority to agree any changes by the start of

	Set Project, in consultation with Employers and accompanied by an explanatory commentary.			September, for re-publication by the end of October.

* Where no students have sat an ESP, or no students have achieved a pass at grades A or E, on agreement with the Authority the Supplier may defer production of the Employer Set Project Grade Exemplar Responses to the next Academic Year.

Schedule 2 Annex 3

TQ Spec

T-LEVELS | Institute for Apprenticeships & Technical Education

Qualification specification

T Level Technical Qualification in Science

Version 2.0 19 June 2023 603/6989/9
Internal reference: TQ-Science-spec

NCFE CACHE

T Level Technical Qualification in Science
Qualification Specification

Science

[603/6989/9]

Contents

Section 1: Introduction

A T Level[1] is a composite technical study programme, aimed at preparing young people for work, higher level apprenticeships or higher education (HE). It comprises 4 key components:

- an approved technical qualification, which includes the opportunity to specialise in at least one occupational role
- a substantial industry placement with an external employer (further information regarding the required number of hours can be found on page 10)
- employability, enrichment and pastoral (EEP) elements
- in some cases, it may also include mandatory additional requirements (MAR), such as important licence to practise qualifications

The T Level Technical Qualification in Science forms part of the new T Level in Health and Science. The outline content has been produced by T Level panels based on the same standards as those used for apprenticeships. The outline content formed the basis of this qualification and has been further developed by NCFE.

The Technical Qualification (TQ) in Science has 2 components:

- core component:
  - route core elements
  - pathway core elements
- occupational specialism components:
  - technical: laboratory sciences
  - technical: food sciences
  - technical: metrology sciences

The core, comprising route and pathway core components, provides a variety of knowledge and skills relevant to the health and science route as a whole, as well as the occupational specialism components within the science pathway. Some of the core topics and ideas are broken down and contextualised in more detail within the occupational specialisms, allowing students to apply the knowledge and skills in their own specific context.

Each occupational specialism component covers the knowledge, understanding, skills and behaviours required to achieve threshold competence in a chosen occupational specialism. Threshold competence refers to the level of competence deemed by employers as sufficient to secure employment in roles relevant to an occupational specialism. Achievement of threshold competence signals that a student is well placed to develop full occupational competence, with further support and development, once in work.

English, mathematics and digital skills have also been embedded throughout the TQ and must be taught when highlighted in the content.

[1] T Level is a registered trade mark of the Institute for Apprenticeships and Technical Education

About this TQ specification

To ensure that you are using the most up-to-date version of this TQ specification, please check the version number and date in the page footer against that of the TQ specification on the NCFE website.

If you advertise this qualification using a different or shortened name, you must ensure that students are aware that their results will state the full regulated qualification title.

Section 2: Summaries

Technical qualification summary

Qualification title

Level 3 T Level Technical Qualification in Science

Qualification number (QN)

603/6989/9

Aim reference

60369899

Qualification level

Level 3

Guided learning hours (GLH) and total qualification time (TQT)

	GLH for delivery	GLH for assessment	Total GLH	TQT
Core component	495	23 hours	518 hours	570
Technical: laboratory sciences	650	16	666	733
Technical: food sciences	700	23	723	795
Technical: metrology sciences	600	16	616	678

The guided learning hours shown above only include time for the technical qualification element of the T Level programme; they do not include time allocated for the additional components of the T Level programme.

GLH will vary across the technical qualification (TQ), due to the different requirements of each occupational specialism.

Minimum age

T Level technical qualification students must be a minimum of 16 years of age.

Qualification purpose

The purpose of the Level 3 TQ in Science is to ensure students have the knowledge and skills needed to progress into skilled employment or higher level technical training relevant to the T Level.

Objectives

The objectives of this qualification are to equip students with:

- the core knowledge and core skills relevant to science
- up-to-date occupational knowledge and skills that have continued currency amongst employers and others
- the necessary English, mathematics and digital skills
- threshold competence that meets employer expectations and is as close to full occupational competence as possible
- opportunities to manage and improve their own performance

Industry placement experience

Industry placements are intended to provide students with the opportunity to develop the knowledge, skills and behaviours required for skilled employment in their chosen occupation and which are less easily attainable by completing a qualification alone.

As part of achieving the overall T Level programme, students are required to complete a minimum of 315 hours industry placement. In order to demonstrate threshold competence in their chosen occupational specialism, the student will be observed during their industry placement.

It is the provider's responsibility to ensure the minimum number of hours is undertaken by the student.

There may be specific requirements for providers and employers to consider prior to the student commencing a work placement. Please see the industry placement guidance from the Institute for Apprenticeships and Technical Education.

There are specific requirements for providers and employers relating to the insurance of students in the workplace. Further information about insurance can be found at www.abi.org.uk or www.hse.gov.uk/youngpeople/index.htm.

Temporary flexibilities for industry placements

Recognising the ongoing impact of Covid-19, the Department for Education has introduced temporary flexibilities for 2021 T Level students undertaking health and science. These flexibilities will ensure that industry placements are deliverable and aligned to current working practices. They will be withdrawn in July 2023.

For full details, please refer to: temporary flexibilities for Wave 1 and Wave 2 industry placements. Providers must still plan to deliver placements against the core principles set out in the T Level industry placement delivery guidance. These flexibilities should be used by exception and as a last resort.

Rules of combination

Students are required to complete:

- the core component

- one occupational specialism component

Students must not complete more than one occupational specialism component.

Approved providers can select which occupational specialism component to deliver to their students.

Grading

Component	Grade
Core component	A* to E and U
Occupational specialism components	Distinction/merit/pass and ungraded

Assessment method

Core component

- 2 written examinations
- employer-set project (ESP)

In order to achieve a grade for Core Component, students must have results for both sub-components (the core (written) examination and the employer-set project).

The combined results from these sub-components will be aggregated to form the overall Core Component grade (A*–E and U).

If students fail to reach the minimum standard across all sub-components, they will receive a U grade. No overall grade will be issued for the core component until both sub-components have been attempted.

Occupational specialism component

- synoptic assignments

The student is also required to successfully achieve a distinction/merit/pass grade in one of the occupational specialism components. If the student fails to reach the specified level of attainment, they will receive a U grade.

Progression including job roles (where applicable)

Students who achieve this qualification could progress to the following, depending on their chosen occupational specialism:

- employment:
  - science technician (for example, food technologist, laboratory technician, metrology technician)
- higher education
- apprenticeship (progression onto lower level apprenticeships may also be possible in some circumstances, if the content is sufficiently different)

UCAS

The T Level study programme is eligible for UCAS points. Please check the UCAS website for more information.

Regulation information

This is a regulated qualification.

Funding

This qualification is eligible for funding. For further guidance on funding, please contact the Education and Skills Funding Agency (ESFA).

English, mathematics and digital content

English, mathematics and digital content are embedded and contextualised within the science qualification content. This content must be taught to all students and will be subject to assessment.

Entry guidance

This qualification is designed for post-16 students.

There are no specific prior skills/knowledge a student must have for this qualification. However, students would be expected to have a level 2 qualification or equivalent.

Providers are responsible for ensuring that this qualification is appropriate for the age and ability of students. Providers must make sure that students can fulfil the requirements of the core and chosen occupational specialism and comply with the relevant literacy, numeracy, digital and health and safety aspects of this qualification.

Students registered on this qualification should not undertake another qualification at the same level with the same or a similar title, as duplication of learning may affect funding eligibility.

Transition programme

For those students who are not yet ready to start a T Level programme at 16, they will be able to study a new T Level transition programme. This is a new 16 to 19 study programme designed to give young people effective, tailored preparation specifically to help them progress onto and succeed in a T Level.

The T Level transition programme will be introduced through phased implementation, working initially with a small number of volunteer T Level schools, colleges and training companies, to explore different approaches to delivery and develop good practice in effectively preparing students for a T Level. More information on the T Level transition programme can be found on the government’s website.

Registering students on T Levels

We expect students to make a decision about their T Level pathway within the first few weeks of their course, supported by good information, advice and guidance from their provider. For example, a student might know that they want to do a Digital T Level, but not be clear at the outset whether that should be Digital Production, Design and Development; Digital Support Services; or Digital Business Services. If a provider is offering 2 or 3 of the available pathways, there may be some co-delivery or other activity in the first few weeks which provides students with the opportunity to find out about different occupations, for example through employer visits. A student’s

chosen T Level pathway and OS should be recorded on the Individual Learner Record (ILR) or School Census in October of year 1.

To ensure there is sufficient time to cover the curriculum, decisions about OSs should be confirmed by the end of the first year, although this could be much earlier depending on a provider's curriculum model. For example, some providers start teaching the OS early on in first year and require students to make a decision about this at the start of their course, whereas other providers may only start teaching OSs in the second year. In order to ensure that providers receive the right level of funding, a student's OS must be confirmed in the final data return of year 1 (ILR R14/Autumn Census), although changes after this date are possible.

Providers will also need to ensure that they register their students on the TQ with the awarding organisation and enter them for assessments as relevant.

Transferring between T Levels and occupational specialisms (OSs)

We expect some students to switch between T Levels. Providers should consider the degree of overlap between the 2 T Levels and the remaining time before any assessments in determining if a transfer is possible – or whether a student will need to restart their T Level. Attainment from one T Level cannot count towards another, and all students will need to take and pass the relevant assessments in order to pass their T Level.

Some students may also want to switch to a different OS within the same T Level pathway, including in the second year. It is less likely that there will be any overlap between OSs, so any decision will depend on the provider's curriculum model and the stage a student has reached in their OS learning. Any changes to a student's T Level – whether pathway or OS – should be recorded on the ILR/Census as soon as possible and should also match the registration and assessment entries submitted to the relevant awarding organisation.

Achieving this qualification

To achieve this qualification, the student must successfully demonstrate their achievement of the core component and one occupational specialism component.

In order to achieve a grade for the core component, the student must attempt both the external examination and ESP sub-components. The results from these will be aggregated to form the overall core component grade (A* to E and U). If students do not attempt one of the sub-components, an overall component grade will be withheld pending the attempt of both. If students fail to reach the minimum standard across sub-components after attempting both, they will receive a U grade for the component.

The student is required to successfully achieve a distinction/merit/pass grade in one of the occupational specialism components. If the student fails to reach the specified level of attainment, they will receive a U grade.

Retakes

Core component retakes

There is the opportunity for students to retake the core assessments in order to improve their marks. This includes:

- 2 written examinations
- ESP

The core component’s written examination is made up of 2 papers. If the student wants to retake the written examination assessment, they must retake both papers, in the same series..

Students can retake the core components in different series, meaning they could sit the ESP in one series and the core exams (both exam papers to be taken in the same series) in the next. There is no limit to the number of retakes a student can complete. However, any retake must be completed within 2 years after the completion of the student's T Level programme.

When determining each student’s overall achievement for the core component, the highest achievement in each core assessment (written examination and ESP) is used.

Occupational specialism component retakes

Although retakes are permitted for the occupational specialism, it is unlikely that students will be able to fit a retake opportunity into the delivery timetable.

If a retake opportunity is scheduled, the student must retake all synoptic assignments for the chosen occupational specialism. There will be one opportunity per year to sit the occupational specialism, meaning a retake of the occupational specialism would be sat in the next academic year of study. There is no limit to the number of retakes a student can complete. However, any retake must be completed within 2 years after the completion of the student's T Level programme.

Technical qualification components

Component	Level	Content
Core component (Section A: the health and science sector)	3	A1 Working within the health and science sector A2 The science sector A3 Health, safety and environmental regulations in the health and science sector A4 Application of safety, health and environmental practices in the workplace A5 Managing information and data within the health and science sector A6 Data handling and processing A7 Ethics A8 Good scientific and clinical practice A9 Scientific methodology A10 Experimental equipment and techniques

Component	Level	Content
Core component (Section B: science concepts)	3	B1 Core science concepts B2 Further science concepts

Component	Level	Content
Employer-set project – core skills	3	CS1 Project management CS2 Researching CS3 Working with others CS4 Creativity and innovation CS5 Communication CS6 Reflective evaluation

Students are required to complete one occupational specialism option.

Component	Level	Content
Technical: laboratory sciences	3	1 Perform a range of appropriate scientific techniques to collect experimental data in a laboratory setting, complying with regulations and requirements 2 Plan, review, implement and suggest improvements to scientific tasks relevant to a laboratory setting 3 Identify and resolve issues with scientific equipment or data errors
Technical: food sciences	3	1 Perform appropriate activities to support the food supply chain complying with regulatory requirements 2 Develop new food and food related products to support the food supply chain 3 Identify and resolve issues in the food supply chain 4 Collect, analyse and interpret food production data
Technical: metrology sciences	3	1 Plan appropriate scientific measurement for any measure and to comply with regulatory requirements 2 Perform scientific measurement tasks using the most appropriate measurement for a measure and to ensure accuracy 3 Collect, analyse and interpret data from measurement tasks 4 Identify and resolve issues with measurement tools and equipment

Employer involvement

The outline content for this qualification was devised by T Level panels. The panels consisted of employers and industry stakeholders.

We have worked in partnership with employers and other stakeholders to elaborate the content further, create the assessments and set the standards to ensure students achieve the level of competence needed to enter skilled employment.

Progression to higher level studies

This qualification aims to provide students with a number of progression options, including higher level studies at university or FE colleges. The skills required to progress to higher academic studies are different from those required at levels 1 and 2. Level 3 qualifications enable the development of these skills. Although there is no single definition of higher level learning skills, they include:

- checking and testing information
- supporting points with evidence
- self-directed study
- self-motivation
- thinking for yourself
- analysing and synthesising information/materials
- critical thinking and problem solving
- working collaboratively
- reflecting upon learning and identifying improvements
- presenting information in written and verbal formats

Level 3 criteria can require students to analyse, draw conclusions, interpret or justify, which are all examples of higher level skills and support progression and further learning. If you need any further information, please refer to the Progression to Higher Education section of the CACHE website.

How the qualification is assessed

Assessment is the process of measuring a student's skill, knowledge and understanding against the standards set in a qualification.

The core component is 100% externally assessed. External assessments are set and marked by NCFE. The external examinations and ESP will assess students' core knowledge, core understanding and core skills relevant to the occupations within the science TQ.

The occupational specialism components are also externally assessed through synoptic assignments, except for the observation element, which is internally marked by providers and externally moderated by NCFE. These synoptic assignments will assess the knowledge, understanding, skills and behaviours required to achieve threshold competence in the student's chosen occupational specialism.

Providers must not give any feedback to the student about their performance in any of the externally assessed components or observation elements.

The assessment consists of:

- core component:
  - 2 written examinations
  - ESP
- occupational specialism component:
  - synoptic assignments (specific to each occupational specialism)

Quality of written communication

Quality of written communication is assessed within targeted marks for the core examinations and is embedded throughout the assessment objectives within the ESP. No specific marks are available within the occupational specialism; however, a good command of communication and written work is anticipated for success at this level.

Application of mathematics, significant figures and decimal places

Throughout the core examinations for all pathways, students will be assessed on their understanding and application of mathematics. Some questions may require answers to be given to a number of significant figures or a given number of decimal places.

A paper may contain marks that are dependent on students giving final answers to a specified number of significant figures or decimal places. A significant figure mark may not be awarded for an answer given in surd form. In questions where the command word is calculate and the final answer is required in either format, the question should be calculated to at least one additional significant figure or decimal place before giving the final answer as requested in the question.

In all cases where an answer is required to a number of significant figures or decimal places, this will be specified in the question.

Rationale for synoptic assessment

Synoptic assessment tests students' understanding of the connections between the topics covered across the performance outcomes within the chosen occupational specialism.

Synoptic assessment enables students to integrate and apply knowledge, understanding and skills with breadth and depth. It also requires them to demonstrate their capability to apply knowledge, understanding and skills across the chosen occupational specialism.

Scheme of assessment for each component

Each component in the core is worth the following weighting:

	% weighting of the core component
Paper A	34
Paper B	36
Sub-total	70
ESP	30
Total	**100%**

External examinations (core)

Overview of assessment

Paper A

Written examination

Duration: 2 hours 30 minutes

100 marks (plus 12 marks for Quality of Written Communication) = 112 marks total

This paper is composed of 4 sections, which may consist of multiple-choice questions, short-answer and extended writing:

- Section A: 25 marks
- Section B: 25 marks
- Section C: 25 marks
- Section D: 25 marks

Paper B

Written examination

Duration: 2 hours 30 minutes

110 marks inclusive of 8 to 10 marks for maths (plus 9 marks for Quality of Written Communication) = 119 marks total

This paper is composed of 4 sections, which may consist of multiple-choice questions, short-answer and extended writing:

- Section A: 45 marks
- Section B: 27 marks

- Section C: 18 marks
- Section D: 20 marks

Content subject to assessment

Paper A: route and pathway core elements A1 to A10

Section 1 – Working within the science sector

- A1 - Working within the health and science sector (R)
- A2 - The science sector (P)
- A8 - Good scientific and clinical practice (R)

Section B – Ethics, data and managing personal information in the science sector

- A5 - Managing information and data within the health and science sector (R)
- A6 - Data handling and processing (P)
- A7 - Ethics (P)

Section C – Health and safety in the science sector

- A3 - Health, safety and environmental regulations in the health and science sector(R)
- A4 - Application of safety, health and environmental practices in the workplace (P)

Section D – Scientific methodology, equipment and techniques

- A9 - Scientific methodology (P)
- A10 - Experimental equipment and techniques (P)

Paper B: route and pathway core elements B1 to B2

Section A – B1 Biology

- structure and function of cells and tissues(R)
- large molecules (R)
- exchange and transport mechanisms (R)
- genetic information and genetics(R)
- microbiology (R)
- immunology (R)
- classification of biological materials (P)
- enzyme and protein structure (P)
- cell cycle (P)
- cellular respiration (P)
- pathogens (causative agents) (P)

- formulae and equations (P)
- units (R)

Section B - B1 Chemistry

- structure of materials and chemical properties (R)
- acids/bases and chemical change (R)
- rates of reaction and energy changes (R)
- chemical analysis of substances (P)
- analytical techniques (P)
- gas laws (P)
- formulae and equations (P)
- units (R)

Section C – B1 Physics

- electricity (R)
- magnetism and electromagnetism (R)
- waves (R)
- particles and radiation (R)
- formulae and equations (P)
- kinetic changes (P)
- pressure/fluid/viscosity (P)
- units (R)

Section D – B2 Further Scientific Concepts

- taken from any of the above content areas: Biology, Chemistry and Physics

P= Pathway

R= Route/Core

Assessment objectives and weightings

The external (core) examinations will assess how students have achieved the following assessment objectives (AOs):

	Assessment objectives	**Weighting***
AO1	Demonstrate knowledge and understanding of contexts, concepts, theories and principles in science.	29%

AO2	Apply knowledge and understanding of contexts, concepts, theories and principles in science to different situations and contexts	40%
AO3	Analyse and evaluate information and issues related to contexts, concepts, theories and principles in science to make informed judgements, draw conclusions and address individual needs.	31%

*Both paper A and paper B allocate 6 marks to the Quality of Written Communication (QWC) or maths. These marks are bolted on and do not impact on the AO weightings. For example, paper A totals 112 marks of which the AO weightings apply to a total of 100 marks, with the remaining 12 assessing QWC.

Total marks

Paper	Assessment length	% weighting of the core component	Maximum raw mark	Max UMS
Paper A	2 hours 30 minutes	34%	112	140
Paper B	2 hours 30 minutes	36%	119	140

AO	Paper A	Paper B	Total
AO1	28 marks (28%)	33 marks (30%)	61 marks (29%)
AO2	40 marks (40 %)	44 marks (40%)	84 marks (40%)
AO3	32 marks (32%)	33 marks (30%)	65 marks (31%)
QWC	12 marks	9 marks	21 marks
Total	112 marks	119 marks	231 marks

The tables above show how each core examination will target the AOs in this qualification. Each version of the core examination will adhere to these mark and percentage weightings.

Additional marks allocated for QWC or maths are not included in the overall AO weightings.

Assessment availability

There will be 2 assessment opportunities per year in summer (May/June) and autumn (November/December). Please refer to the Assessment Timetable on the NCFE website for further information.

Assessment conditions

The core external examinations must be invigilated.

All students' scripts must be submitted to NCFE for marking. All assessment material must be securely stored by the approved provider. Onscreen assessments will be submitted through the online assessment platform.

Please refer to the regulations for conduct of external assessments for further information on the assessment conditions. Please refer to the NCFE website for an up-to-date copy of the regulations.

ESP (core component)

Overview of assessment

Externally-set (in conjunction with employers) project

The purpose of the employer-set project is to ensure that students have the opportunity to apply core knowledge and skills to develop a substantial piece of work in response to an employer-set brief. The brief and tasks are contextualised around an occupational area and chosen by the student ahead of the assessment window.

Duration: 18 hours

Subject content to be assessed

The ESP is designed to target the core skills and relevant core knowledge in a valid and sufficient manner, which will be consistent over time.

Core skills

In completing the employer-set project, the student will demonstrate 7 core skills, supported by underpinning knowledge and understanding set out in the core component.

Core skill 1	Project management: to include independently producing a high-level project plan taking into account: timing of activities, resource and financial considerations, adherence to health and safety and the maintenance of quality outcomes
Core skill 2	Researching: from independently identified sources including scientific literature and other appropriate sources, prior to the project commencement and referencing these sources appropriately
Core skill 3	Working with others: for example, to ensure that any scientific techniques meet all safety, health and environmental requirements
Core skill 4	Creativity and innovation: within a science context to improve practice processes and outcomes
Core skill 5	Problem solving: within a science context and where appropriate making use of new technologies to solve problems
Core skill 6	Communication: for example, providing results and recommendations in appropriate formats to clients and wider stakeholders which take into consideration ‘business benefits’ or show commercial awareness in a variety of formats including written reports and verbal presentations
Core skill 7	Reflective evaluation: to be able to make improvements to own practice, for example having completed a task reviewing and suggesting improvements and considerations of lessons learnt for own professional development

Assessment objectives

Assessment objectives (AOs)		Weighting
AO1	Plan their approach to meeting the project brief	12 8.1%
AO2	Apply core knowledge and skills to the development of a scientific project	69 46.9%
AO3	Select relevant techniques and resources to meet the brief	16 10.9%
AO4	Use English, maths, and digital skills as appropriate	22 15.0%
AO5	Realise a project outcome and review how well the outcome meets the brief	28 19.0%

AO/Task:	Task 1	Task 2	Task 3	Task 4	Task 5	Task 6	
AO1	0	12	0	0	0	0	8.1%
AO2	18	12	16	12	4	7	46.9%
AO3	0	0	6	6	2	2	10.9%
AO4	4	4	6	4	0	4	15.0%
AO5	0	8	6	6	3	5	19.0%
Total	22 marks	36 marks	34 marks	28 marks	9 marks	18 marks	147/100%

Total marks 147

Assessment availability

There will be 2 assessment opportunities per year in summer (May/June) and autumn (November/December). Please refer to the Assessment Timetable on the NCFE website for further information.

Assessment conditions

All tasks must be completed under supervised conditions. This means students can access resources in order to complete their assessment.

The approved provider must securely retain all students' evidence and submit that evidence to NCFE for marking.

Please refer to the regulations for conduct of external assessments for further information on the assessment conditions. Please refer to the NCFE website for an up-to-date copy of the regulations.

UMS

The core component is modular, which means that a student can take and resit the assessments in different assessment windows. Assessments may vary slightly in levels of difficulty and, therefore, the mark that represented a C grade in the external examination in one assessment window may not be appropriate in the following assessment window.

To address this, we convert raw marks to uniform marks. The uniform mark scale (UMS) also allows us to account for the relative weighting of the assessment to the qualification as a whole. The maximum UMS points available for each assessment, and the UMS points relating to each grade boundary, are fixed. These are shown in the following table:

Grade boundary	External examination	ESP	Overall
Max	280	120	400
A*	252	108	360
A	224	96	320
B	196	84	280
C	168	72	240
D	140	60	200
E	112	48	160
U	0	0	0

The external examination comprises 2 papers, the results of which are combined before conversion to UMS. Combined grade boundaries for each series will be set by adding together the equivalent boundaries for each paper.

The raw mark grade boundaries are set after each assessment window. NCFE sets these boundaries judgementally, following both qualitative and quantitative analysis, and then converts them to UMS.

Although the raw mark grade boundaries in assessment window 1 and assessment window 2 are different, they have the same value in terms of UMS marks (168 for a C and 196 for a B) when contributing to the qualification as a whole. NCFE will publish the raw mark grade boundaries following the completion of each assessment window.

Scheme of assessment for each component

Occupational specialism – Technical: laboratory sciences

Overview of assessment

Synoptic assignments comprise 3 assessments.

Duration: 16 hours

Content subject to assessment

All performance outcomes within a chosen occupational specialism are subject to assessment:

- **Performance outcome 1:** Perform a range of appropriate scientific techniques to collect experimental data in a laboratory setting, complying with regulations and requirements
- **Performance outcome 2:** Plan, review, implement and suggest improvements to scientific tasks relevant to a laboratory setting
- **Performance outcome 3:** Identify and resolve issues with scientific equipment or data errors

Assessment weightings

Assignment	% weighting of the occupational specialism	Max raw mark	Scaling factor	Max scaled mark
Assignment 1	25	102	1.000	102
Assignment 2	50	70	2.914	204
Assignment 3	25	41	2.488	102
Total	100%	213		408

Total marks

213

Assessment availability

There will be one assessment opportunity per year from summer 2022. Please refer to the Assessment Timetable on the NCFE website for further information.

Assessment conditions

All tasks must be completed under specified conditions. See the tutor guidance in the tutor guidance pack for more detail.

The approved provider must securely retain all students' evidence and submit that evidence to NCFE for marking.

Please refer to the regulations for conduct of external assessments for further information on the assessment conditions. Please refer to the NCFE website for an up-to-date copy of the regulations.

Occupational specialism – Technical: food sciences

Overview of assessment

Synoptic assignments comprise 4 assessments.

Duration: 23 hours

Content subject to assessment

All performance outcomes within a chosen occupational specialism are subject to assessment:

- **Performance outcome 1:** Perform appropriate activities to support the food supply chain complying with regulatory requirements
- **Performance outcome 2:** Develop new food and food related products to support the food supply chain
- **Performance outcome 3:** Identify and resolve issues in the food supply chain
- **Performance outcome 4:** Collect, analyse and interpret food production data

Assessment weightings

Assignment	% weighting of the occupational specialism	Max raw mark	Scaling factor	Max scaled mark
Assignment 1	45	115	1.604	184.5
Assignment 2	30	112	1.098	123
Assignment 3	10	41	1.000	41
Assignment 4	15	42	1.464	61.5
Total	100%	310		410

Total marks

310

Assessment availability

There will be one assessment opportunity per year from summer 2022. Please refer to the Assessment Timetable on the NCFE website for further information.

Assessment conditions

All tasks must be completed under specified conditions. See the tutor guidance in the tutor guidance pack for more detail.

The approved provider must securely retain all students' evidence and submit that evidence to NCFE for marking.

Please refer to the regulations for conduct of external assessments for further information on the assessment conditions. Please refer to the NCFE website for an up-to-date copy of the regulations.

Occupational specialism – Technical: metrology sciences

Overview of assessment

Synoptic assignments comprise 3 assessments.

Duration: 16 hours

Content subject to assessment

All performance outcomes within a chosen occupational specialism are subject to assessment:

- **Performance outcome 1:** Plan appropriate scientific measurement for any measurand to comply with regulatory requirements
- **Performance outcome 2:** Perform scientific measurement tasks using the most appropriate measurement for a measurand to ensure accuracy
- **Performance outcome 3:** Collect analyse and interpret data from measurand tasks
- **Performance outcome 4:** Identify and resolve issues with measurement tools and equipment

Assessment weightings

Assignment	% weighting of the occupational specialism	Max raw mark	Scaling factor	Max scaled mark
Assignment 1	25	67	1.000	67
Assignment 2	50	104	1.288	134

Assignment 3	25	63	1.063	67
Total	100%	234		268

Total marks

234

Assessment availability

There will be one assessment opportunity per year from summer 2022. Please refer to the Assessment Timetable on the NCFE website for further information.

Assessment conditions

All tasks must be completed under specified conditions. See the tutor guidance in the tutor guidance pack for more detail.

The approved provider must securely retain all students' evidence and submit that evidence to NCFE for marking.

Please refer to the regulations for conduct of external assessments for further information on the assessment conditions. Please refer to the NCFE website for an up-to-date copy of the regulations.

Paper-based examination

The core written examinations will be available as onscreen and as paper-based examinations. A different version of each examination will be available per mode.

The ESP and the occupational specialism assessments will be released and accessed by providers electronically. The submission of any assessment evidence from providers will also be digital and provided to NCFE electronically, unless otherwise specified.

For instructions on conducting external assessments (including information on malpractice/maladministration), please refer to our regulations for the conduct of external assessments and qualification specific instructions for delivery documents, which are available on the Policies and Documents page on the NCFE website.

Sample assessment materials

Sample assessment materials can be found on the qualification page on the NCFE website.

Results

Results for each component will be released in accordance with the assessment windows. Please refer to the assessment windows on the NCFE website for further information.

Enquiries about results

If a provider believes a student's result is at variance with their reasonable expectations, they can submit an enquiry about a result in line with our enquiries about results and assessment decisions policy, which is available on the Policies and Documents page on the NCFE website.

Grading

Core component

The core component is graded A* to E and U.

Core component grade descriptors

Grade	Demonstration of attainment
A	A grade A student can:
	consistently demonstrate a comprehensive range of relevant and appropriate terminology, and do so, accurately
	consistently demonstrate a comprehensive range of relevant skills, appropriate to the task
	consistently demonstrate a comprehensive understanding of ideas, processes and procedures applied to familiar and unfamiliar contexts
	consistently and accurately use a comprehensive range of mathematical skills relevant to the sector
	critically analyse novel information and data, in a variety of formats, and support this with relevant examples and analysis
	construct reasoned arguments, make substantiated judgements and reach valid conclusions
	consistently organise and present information clearly, concisely and accurately, and support this with relevant examples and analysis
	evaluate information in a variety of formats, to make detailed and relevant comments on strengths and limitations
	effectively link appropriate principles and concepts from the sector, to further understanding
E	A grade E student can:
	demonstrate a limited use of terminology, but this may be inconsistent and inaccurate

Grade	Demonstration of attainment
	demonstrate a limited range of skills, however these may not always be relevant to the task
	demonstrate a limited understanding of ideas, processes and procedures, applied to some familiar and unfamiliar contexts
	use a limited range of simple mathematical skills relevant to the sector
	demonstrate a limited ability to analyse novel information and data, the links to any supporting examples may be tenuous or unclear
	effective organisation and presentation of information is limited, if supported with examples and analysis, this will be rudimentary and may not be relevant
	make limited and simplistic comments on strengths and weaknesses
	make simplistic links between some principles and concepts to further understanding

Occupational specialism components

The occupational specialism components are graded distinction, merit, pass and ungraded.

Technical: laboratory sciences grade descriptors

Grade	Demonstration of attainment
Pass	The evidence is logical but displays minimal relevant knowledge or understanding in response to the demands of the brief
	The student makes some use of relevant knowledge and understanding of how it informs practices of the sector and demonstrates a limited understanding of skills or approaches associated with the laboratory sciences sector
	The student makes adequate use of facts/theories/approaches/concepts and attempts to demonstrate breadth and depth of knowledge and understanding of the different aspects of the task

Grade	Demonstration of attainment
	The student is able to identify some information from appropriate sources and makes use of appropriate information/appraise relevancy of information and can combine information to make decisions
	The student makes minimal judgements/takes appropriate action/seeks clarification with guidance and is able to make limited progress towards solving non-routine problems in real life situations
	The student attempts to demonstrate skills and knowledge of the relevant concepts and techniques reflected in a lab science setting and generally applies this across different contexts
	The student shows adequate understanding of unstructured problems that have not been seen before, using limited knowledge to find solutions to problems and make justification for strategies for solving problems, explaining their reasoning
Distinction	The evidence is precise, logical and provides a detailed and informative response to the demands of the brief
	The student makes extensive use of relevant knowledge and has extensive understanding of the principles and practices of the sector and demonstrates an understanding of the different approaches/skills associated with the laboratory science sector
	The student makes decisive use of facts/theories/approaches/concepts, demonstrating extensive breadth and depth of knowledge and understanding and selects highly appropriate skills/tasks/techniques/methods
	The student is able to comprehensively identify information from a range of suitable sources and makes exceptional use of appropriate information/appraises relevancy of information and can combine information to make coherent decisions
	The student makes well founded judgements/takes appropriate action/seeks clarification and guidance and is able to use that to reflect on real life situations in a lab science role
	The student demonstrates extensive knowledge of relevant concepts and techniques reflected in a lab science role and precisely applies this across a variety of contexts and tackles unstructured problems that have not been seen before, using their knowledge to analyse and find suitable solutions to the problems
	The student can thoroughly examine data/information in context and apply appropriate analysis in confirming or refuting conclusions and carrying out further work to justify strategies for solving problems, giving concise explanations for their reasoning

Technical: food sciences grade descriptors

Grade	Demonstration of attainment
Pass	The evidence is logical but displays minimal knowledge in response to the demands of the brief.
	The student makes some use of relevant knowledge and understanding of how it informs practices of the sector and demonstrates a limited understanding of perspectives or approaches associated with food science and food product development processes.
	The student makes adequate use of facts/theories/approaches/concepts/data and attempts to demonstrate breadth and depth of knowledge and understanding.
	The student is able to identify some information from appropriate sources and makes use of appropriate information/appraise relevancy of information and can combine information to make decisions and recommendations.
	The student makes minimal judgements/takes appropriate action/seeks clarification with guidance and is able to make limited progress towards solving non-routine problems in real life situations.
	The student attempts to demonstrate skills and knowledge of the relevant concepts and techniques reflected in a food science and/or food product development role and generally applies this across different contexts.
	The student shows adequate understanding of problems that have not been seen before, using limited knowledge to find solutions to problems and make justification for strategies for solving problems, explaining their reasoning.
Distinction	The evidence is precise, logical and provides a detailed and informative response to the demands of the brief.
	The student makes extensive use of relevant knowledge and has extensive understanding of the practices of the sector and demonstrates an understanding of the different perspectives/approaches associated with food science and food development processes.
	The student makes decisive use of facts/theories/approaches/concepts/data, demonstrating extensive breadth and depth of knowledge and understanding and selects highly appropriate skills/techniques/methods.
	The student is able to comprehensively identify information from a range of suitable sources and makes exceptional use of appropriate information/appraises relevancy of information and can combine information to make coherent decisions.

Grade	Demonstration of attainment
	The student makes well founded judgements/takes appropriate action/seeks clarification and guidance and is able to use that to reflect on real life situations in a food science and/or food development role.
	The student demonstrates extensive knowledge of relevant concepts and techniques reflected in a food science and/or food development role and precisely applies this across a variety of contexts and tackles unstructured problems that have not been seen before, using their knowledge to analyse and find suitable solutions to the problems.

Technical: metrology sciences grade descriptors

Grade	Demonstration of attainment
Pass	The evidence is logical but displays minimal knowledge of basic metrological content in response to the demands of the brief.
	The student makes some use of relevant knowledge and understanding of how metrology informs practices in many sectors and demonstrates a limited understanding of perspectives or approaches associated with basic measurement tasks and principles.
	The student makes adequate use of facts/theories/approaches/concepts and attempts to demonstrate breadth and depth of metrological knowledge and understanding.
	The student is able to identify some metrological information from appropriate sources and makes use of appropriate information/appraise relevancy of information and can combine information to make decisions.
	The student makes minimal judgements/takes appropriate action/seeks clarification with metrological sources of guidance and is able to make limited progress towards solving non-routine problems in real life measurement activities/situations.
	The student attempts to demonstrate metrological skills and knowledge of the relevant concepts and techniques reflected in a measurement services role and generally applies this across different contexts and measurement skill sets.
	The student shows adequate understanding of unstructured measurement-related problems that have not been seen before, using limited knowledge to find solutions to problems and make justification for strategies for solving problems, explaining their reasoning.
Distinction	The metrological evidence is precise, logical and provides a detailed and informative response to the measurement related demands of the brief.
	The student makes extensive use of relevant knowledge and understanding of how metrology informs practices in many sectors and demonstrates an understanding of perspectives or approaches associated with basic measurement tasks and principles.
	The student makes decisive use of facts/theories/approaches demonstrating extensive breadth and depth of metrological knowledge, understanding and selects highly appropriate skills/techniques/methods.

Grade	Demonstration of attainment
	The student is able to comprehensively identify metrological information from a range of suitable sources and makes exceptional use of appropriate information/appraise relevancy of information and can combine information to make coherent measurement decisions.
	The student makes well founded judgements/takes appropriate action/seeks clarification with metrological sources of guidance and is able to use that to reflect on real life measurement activities/situations.
	The student demonstrates extensive metrological skills and knowledge of the relevant concepts and techniques reflected in a measurement services role and precisely applies this across a variety of contexts and tackles unstructured problems that have not been seen before, using their knowledge and measurement skill sets to analyse and find suitable solutions to the measurement problems.
	The student can thoroughly examine metrological data/information in context and apply appropriate analysis in confirming or refuting conclusions and carrying out further work to justify strategies for solving problems, giving concise explanations for their reasoning.

* “threshold competence” refers to a level of competence that:

- signifies that a student is well placed to develop full occupational competence, with further support and development, once in employment
- is as close to full occupational competence as can be reasonably expected of a student studying the TQ in a classroom-based setting (for example, in the classroom, workshops, simulated working and (where appropriate) supervised working environments)
- signifies that a student has achieved at least a pass in relation to the relevant occupational specialism component

U grades

If a student is not successful in reaching the minimum threshold for the core and/or occupational specialism component, they will be issued with a U grade.

Awarding the final grade for each component of the TQ

Each core component’s marks will be combined to form the overall grade for the core component.

The marks from the occupational specialism assignment will form the occupational specialism grade.

These grades will be submitted to the Institute for Apprenticeships and Technical Education who will issue an overall grade for the T Level TQ.

Calculating the final grade for the T Level programme

To be awarded an overall T Level grade, a student must successfully pass both components of their TQ, complete an industry placement, and meet any other requirements set by the Institute's T Level panel. The overall grade for the T Level programme is based on a student's performance in the TQ and would reflect:

- the comparative size of the core component and the occupational specialism
- the grades achieved for the core component (A* to E) and the occupational specialism (Pass/Merit/Distinction)

This grading approach also makes it possible to recognise exceptional achievement, through the award of an overall distinction* grade for students that achieve an A* for the core component and a distinction in their occupational specialism.

The following table shows how the core component and occupational specialism grades are aggregated to produce an overall result for this T Level programme:

- Core component 40%/Occupational specialism 60%:

	Occupational specialism grade			
Core component grade		**Distinction**	**Merit**	**Pass**
	A*	Distinction*	Distinction	Distinction
	A	Distinction	Distinction	Merit
	B	Distinction	Merit	Merit
	C	Distinction	Merit	Pass
	D	Merit	Merit	Pass
	E	Merit	Pass	Pass

Overall T Level grade

This matrix shows the overall TQ grade when both components are combined.

For example, if a student achieved a B grade in the core component assessment (indicated by the vertical column on the left) and a merit grade in the occupational specialism assessment (indicated by the horizontal top row), they would achieve a merit grade for the overall TQ:

	Occupational specialism grade			
Core component grade		**Distinction**	**Merit**	**Pass**
	A*	Distinction*	Distinction	Distinction
	A	Distinction	Distinction	Merit
	B	Distinction	Merit	Merit
	C	Distinction	Merit	Pass

Merit

	D	Merit	Merit	Pass
	E	Merit	Pass	Pass

Section 3: General competency framework

General competency framework

Technical qualifications are required to contain sufficient and appropriate English, mathematics and digital content to help students reach threshold competence in their chosen occupational specialism. As such, a framework of competencies has been developed which awarding organisations are required to use and embed in all technical qualifications (where appropriate):

General English competencies	General mathematics competencies	General digital competencies
GEC1. Convey technical information to different audiences **GEC2. Present information and ideas** **GEC3. Create texts for different purposes and audiences** **GEC4. Summarise information/ideas** **GEC5. Synthesise information** **GEC6. Take part in/lead discussions**	**GMC1. Measuring with precision** **GMC2. Estimating, calculating and error spotting** **GMC3. Working with proportion** **GMC4. Using rules and formulae** **GMC5. Processing data** **GMC6. Understanding data and risk** **GMC7. Interpreting and representing with mathematical diagrams** **GMC8. Communicating using mathematics** **GMC9. Costing a project** **GMC10. Optimising work processes**	**GDC1. Use digital technology and media effectively** **GDC2. Design, create and edit documents and digital media** **GDC3. Communicate and collaborate** **GDC4. Process and analyse numerical data** **GDC5. Be safe and responsible online** **GDC6. Controlling digital functions**

The following table identifies the English, mathematics and digital competencies that we have embedded in the skills throughout this technical qualification. The tutor may also teach competencies that are not listed here, where they naturally occur, but these will not be subject to assessment.

English, mathematics and digital competencies relevant to the health and science: science qualification

General competencies	Core skills	Technical: laboratory sciences	Technical: food sciences	Technical: metrology sciences
English				
GEC1	CS1.1, CS6.1	S1.70, S2.23	S1.78, S4.10	S1.61, S3.11
GEC2	CS2.1, CS6.1	S2.29	S2.26, S2.33, S4.10	S3.11
GEC3	CS1.1, CS6.1		S1.79, S4.10	
GEC4	CS2.1, CS7.1	S2.16	S2.33	S1.60
GEC5	CS2.1		S2.26	
GEC6	CS6.1	S2.26, S3.11	S1.83, S3.11	S1.65, S4.5, S4.6
Mathematics				
GMC1		S1.75	S1.81, S4.9	S2.9
GMC2	CS4.1	S3.14		
GMC3		S1.77	S2.27	
GMC4				S1.52
GMC5	CS4.1		S2.34, S4.7, S4.8	
GMC6	CS7.1	S2.23	S2.26, S4.9, S4.10	S3.8, S4.4
GMC7				S3.11
GMC8	CS1.1, CS6.1	S1.75, S2.22	S4.10	S3.10
GMC9			S2.31	S1.59

General competencies	Core skills	Technical: laboratory sciences	Technical: food sciences	Technical: metrology sciences
GMC10	CS5.1		S3.9	S4.7
Digital				
GDC1		S1.87, S2.23, S3.8	S1.79, S3.11	
GDC2	CS6.1	S2.23		S1.61
GDC3	CS3.1	S3.11		S1.65
GDC4		S1.87, S2.20, S2.22, S3.13	S1.76, S2.34, S4.7, S4.8	S3.5
GDC5		S2.16	S4.7	S3.5
GDC6				

Section 4: TQ content

Introduction

This section provides details of the structure and content of this qualification.

Qualification structure

The Level 3 Technical Qualification (TQ) in Science has 2 components:

- core component, comprising core knowledge and core skills
- occupational specialism components:
  - technical: laboratory sciences
  - technical: food sciences
  - technical: metrology sciences

This combined content indicates the relevant knowledge and understanding of concepts, theories and principles relevant to all occupations within science. The knowledge and skills are all externally assessed through 2 written examinations and an ESP.

The occupational specialisms are divided into performance outcomes, each of which indicates the knowledge and skills required to enable students to achieve threshold competence in the chosen occupational specialism. These performance outcomes are all externally assessed through synoptic assignments, in which the student will be expected to demonstrate required knowledge and skills.

Delivery of content

The content does not have to be taught in a linear fashion. However, providers must pay attention to when the assessments are due to take place to ensure that all of the mandatory content (all elements and performance outcomes) has been taught to students prior to sitting the assessments.

What you need to teach

This section contains all of the mandatory teaching content that underpins the knowledge and skills. The content provided in some cases may not be exhaustive, and providers may wish to teach beyond what is included in the specification in order to support the student's knowledge and understanding.

English, mathematics and digital competencies have been integrated and contextualised within the skills, throughout the qualification content. These competencies are mandatory and subject to assessment. The tutor may also teach competencies that are not listed in this specification, but these will not be subject to assessment.

Core component section A: the health and science sector

A1 Working within the health and science sector

What you need to teach
The student must understand: **A1.1 The purpose of organisational policies and procedures in the health and science sector, including:** • equality, diversity and inclusion policy: o complying with legislation o ensuring equality o eliminating discrimination • safeguarding policies: o ensuring the protection from harm of individuals, including those working within the organisation and visitors • employment contracts: o setting out employment conditions, rights, responsibilities and duties • performance reviews: o evaluating work performance against standards and expectations o facilitating feedback to improve o providing opportunities to raise concerns or issues o contributing to continuing professional development (CPD) • disciplinary policy: o setting and maintaining expected standards of work and conduct o ensuring consistent and fair treatment o establishing a sequence for disciplinary action • grievance policy: o providing opportunities for employees to confidentially raise and address grievances o establishing a sequence for raising grievances **A1.2 The importance of adhering to quality standards, quality management and audit processes within the health and science sector:** • ensuring consistency • maintaining health and safety

What you need to teach

- monitoring processes and procedures
- facilitating continuous improvement
- facilitating objective, independent review

A1.3 The key principles of ethical practice in the health and science sectors:

- autonomy and informed consent
- truthfulness and confidentiality (for example, ensuring validity of outcomes)
- beneficence
- nonmaleficence
- justice (for example, fairness, equality and respect for all)

A1.4 The purpose of following professional codes of conduct:

- clarifies missions, values, principles and standards that everyone must adhere to by:
  - outlining expected professional behaviours and attitudes
  - outlining rules and responsibilities within individual organisations
  - promotes confidence in the organisation

A1.5 The difference between technical, higher technical and professional occupations in health, healthcare science and science, as defined by the Institute for Apprenticeships and Technical Education Occupational Maps:

- technical: skilled occupations that a college leaver or an apprentice would be entering, typically requiring qualifications at levels 2/3
- higher technical: require more knowledge and skills acquired through experience in the workplace or further technical education, and typically require qualifications at levels 4/5
- professional: occupations where there is a clear career progression from higher technical occupations, as well as occupations where a degree apprenticeship exists

A1.6 Opportunities to support progression within the health and science sector:

- undertaking further/higher education programmes
- undertaking apprenticeship/degree apprenticeship
- undertaking continuing professional development (CPD)
- gaining professional registration
- undertaking an internship
- undertaking a scholarship

A2 The science sector

What you need to teach

The student must understand:

A2.1 Factors that contribute to the diversity of employers/organisations within the science sector:

- size of employer/organisation
- funding streams
- commercial status
- working environments (for example, laboratory, manufacturing plants, field work)
- geographic location

A2.2 The diversity of work undertaken in different job roles within the science sector:

- research and development
- data analysis
- clinical testing/trials
- quality control
- quality assurance
- product development
- scientific publishing
- manufacturing

A2.3 Possible employers and job roles that require the application of science in non-science sectors:

- communication and outreach (for example, science journalist, publisher, public relations, science communication)
- education (for example, teacher, museum education officer)
- policy (for example, officer/administrator of a scientific professional body/trade association)
- public service (for example, civil servant)

A2.4 The difference between a job description and a person specification:

- job description: a detailed description of the individual roles, including responsibilities, objectives and requirements
- person specification: a profile of the necessary skills and attributes

A2.5 How individual roles fit into teams within an organisation:

- whom you work with (for example, colleagues/teams/departments, as seen in an organigram)
- whom you report to (for example, managers/supervisors)

What you need to teach
• whom you manage (for example, direct reports, trainees) **A2.6 The individual's responsibilities in relation to the wider team:** • health and safety (for example, storing, handling and disposing of hazardous substances) • security (for example, complying with access requirements, using technology safely and securely) • organisational policies and procedures (for example, following standard operating procedures (SOPs)) • deadlines (for example, completing work to schedule) • departmental dependencies (for example, preparing samples for colleagues to analyse) **A2.7 The principles of good laboratory practice (GLP):** • quality, reliability and integrity of studies • reporting of verifiable conclusions • traceability of data **A2.8 The principles of good manufacturing practice (GMP) in ensuring that products:** • are of consistent high quality • are appropriate for their intended use • meet the requirements of the product specification **A2.9 The key principles of continuous improvement in relation to scientific tasks:** • reviewing costs (for example using new reagents or products to lower expenditure) • standardising and optimising procedures (for example using new technologies/outsourcing) • using the evaluation cycle: o plan: identify potential problems and plan required improvements o do: implement potential solution o check: analyse the results o act: review the solution and retest if necessary • capturing data at each stage of production (to feed into the evaluation cycle) **A2.10 The difference between quality assurance and quality control:** • quality assurance procedures are designed to prevent errors and defects in products or processes • quality control focuses on the identification of errors and defects in completed products or processes **A2.11 How organisations in the science sector ensure compliance with internal and external regulations:** • ensuring that all individuals follow SOPs

What you need to teach

- complying with requirements for internal and external audits, including reporting to regulators as appropriate
- making sure that staff are adequately trained (for example, knowing the relevant legislation/licences that apply to a specific occupation)

A2.12 How regulatory controls apply in different working environments within the science sector in relation to:

- type and level of required personal protective equipment (PPE)
- standards of health and safety and housekeeping
- requirements for mandatory training to comply with guidance or legislation, refreshed as required
- requirements for disposal of waste
- requirements for health screening and inoculation
- controls specified within SOPs

A2.13 Factors that may have an impact on the commercial activities (for example, pharmaceuticals, cosmetics, manufacturing, services) of science organisations:

- government priorities/policies (for example, food labelling, environmental policies)
- public perception and media influence
- funding streams (for example, changes to private/public funding)
- availability of materials (for example, shortage of feed stocks)
- market demand (for example, increase in vegan food production)
- cost-effectiveness (for example, cost of research, development and production)
- environmental concerns (for example, reducing waste, reducing carbon footprint)

A2.14 The importance and impact of innovation in the science sector:

- fosters economic development (for example, development of genetically modified crops)
- solves large-scale problems (for example, alternative energy)
- improves healthcare (for example, more efficient diagnoses, through the use of Artificial Intelligence (AI), genomic sequencing and genetic tests to personalise treatments)
- develops new products (for example, new drugs, composite materials, for example, graphene)
- enables new scientific discoveries (for example, genome editing, bioinformatics, computational biology)

A3 Health, safety and environmental regulations in the health and science sector

What you need to teach

The student must understand:

A3.1 The purpose of the following legislation and regulations in the health and science sector:

- Health and Safety at Work etc. Act 1974:
  - purpose: defines employers' responsibilities to protect the health, safety and welfare at work of employees and members of the public, and defines employees' duties to protect themselves and each other
- Management of Health and Safety at Work Regulations 1999:
  - purpose: aims to reduce the number and severity of accidents in the workplace, through assessment and management of risk
- Control of Substances Hazardous to Health (COSHH) Regulations 1994 and subsequent amendments 2004:
  - purpose: requirement for employers to control substances hazardous to health by reducing or preventing employees' exposure to these substances
- Personal Protective Equipment at Work (Amendment) Regulations 2022 :
  - purpose: defines employers' responsibilities to provide appropriate personal protective equipment (PPE) to reduce harm to employees, visitors and clients. This can include safety helmets, masks, goggles and gloves
- Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013 (RIDDOR):
  - purpose: defines employers' duties to report serious workplace accidents, occupational diseases and specified dangerous occurrences ('near misses')
- Environmental Protection Act 1990:
  - purpose: makes provision for the improved control of pollution to the air, water and land by regulating the management of waste and the control of emissions
- Special Waste Regulations 1996:
  - purpose: measures relating to the regulation and control of the transit, import and export of waste (including recyclable materials), the prevention, reduction and elimination of pollution caused by waste and the requirement for an assessment of the impact on the environment of projects likely to have significant effects on the environment
- Hazardous Waste Regulations 2005:
  - purpose: controls the storage, transport and disposal of hazardous waste (waste stream) to ensure it is appropriately managed and any risks are minimised
- Waste Electrical and Electronic Equipment Regulations (WEEE) 2013 :

What you need to teach

- purpose: to reduce the amount of electronic and electrical equipment incinerated or sent to landfill sites. Places onus on all businesses to correctly store and transport electrical waste

- Regulatory Reform (Fire Safety) Order (RRO) 2005:
  - purpose: to reduce death, damage and injury caused by fire by placing legal responsibilities on employers to carry out a fire risk assessment. All organisations are required to have procedures for evacuation in the event of a fire
- Manual Handling Operations Regulations 1992 (as amended):
  - purpose: requires employers to assess and minimise the risk to employees' health involved in the manual handling, moving and positioning of an object, person or animal and workplace ergonomics
- Health and Safety (Display Screen Equipment) Regulations 1992:
  - purpose: defines employers' responsibilities in carrying out risk assessments of workstations used by employees, including the use of display screen equipment, to minimise identified risks

A3.2 How to assess and minimise potential hazards and risks, including specific levels of risk, by using the Health and Safety Executive's 5 Steps to Risk Assessment:

- step 1: identifying the hazards
- step 2: deciding who might be harmed and how
- step 3: evaluating the risks and deciding on precautions
- step 4: recording findings and implementing them, including completing risk assessment documentation
- step 5: reviewing your assessment and updating if necessary

A3.3 How health and safety at work is promoted:

- encouraging individuals to take reasonable care of their own and others' safety
- modelling good practice (for example, washing hands and wearing appropriate PPE)
- following organisational policies and standard operating procedures (SOPs), including site-specific emergency procedures
- ensuring that there is clearly visible information and guidance
- following processes for recording and reporting issues and concerns
- maintaining equipment and removing faulty equipment
- following correct manual handling techniques
- ensuring working environments are clean, tidy and hazard free
- appropriately storing equipment and materials
- completing statutory training

What you need to teach
A3.4 How to deal with situations that can occur in a health or science environment that could cause harm to self or others (for example, spillage of hazardous material): • following organisational health and safety procedures • keeping oneself and others safe, including evacuation as appropriate • securing the area • reporting and/or escalating as appropriate • debriefing and reflecting on the root causes, to prevent the situation from recurring

A4 Application of safety, health and environmental practices in the workplace

What you need to teach
The student must understand: **A4.1 The purposes of Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) guidelines in relation to the use of chemicals in the science sector:** • to provide a high level of protection of human health and the environment from the use of chemicals • to make the people who place chemicals on the market (manufacturers and importers) responsible for understanding and managing the risks associated with their use • to promote the use of alternative methods for the assessment of the hazardous properties of substances (for example, quantitative structure-activity relationships and read across) **A4.2 How the Environmental Protection Act 1990 relates to practices in scientific workplaces, including:** • waste management collection, treatment and disposal • containment and uses of genetically modified organisms (for example, risk assessment, inspection) **A4.3 The consequences of breaching environmental legislation, including:** • enforcement notices • business closures • clean-up orders • fines • prison sentences • damage to reputation **A4.4 The purpose of the Control of Major Accident Hazards Regulations 2015 (COMAH):**

What you need to teach
• to prevent or limit the consequences of major accidents involving dangerous substances and to mitigate the effects on people and the environment of those that do occur **A4.5 The COSHH definition of a biohazard (biological agent):** • a microorganism, cell culture or human endoparasite, whether or not genetically modified, which may cause infection, allergy, toxicity, or otherwise create a hazard to human health **A4.6 The 4 hazard groups in relation to biohazards (biological agents):** • category 1: unlikely to cause human disease • category 2: can cause human disease and may be a hazard to employees, unlikely to spread to the wider population and there are usually effective vaccines or other treatments available • category 3: can cause human disease and may be a serious hazard to employees, it may spread to the wider population but there are usually effective vaccines or other treatments available • category 4: causes severe human disease and is a serious hazard to employees, it is likely to spread to the wider population and there are usually no effective vaccines or other treatments available **A4.7 The potential implications of not adhering to COSHH regulations when dealing with biohazards (biological agents):** • risks to employees' health (short and long-term effects of infection) • risks to the wider population (disease spread) • risks to the environment (vegetation, water supply, soil) **A4.8 Containment measures that are used in relation to the 4 hazard groups:** • levels of personal protective equipment (PPE) • laboratory location, access and controls • required laboratory facilities (for example, HEPA filters, showers) • complying with specific waste disposal regulations (for example, chemical decontamination or autoclaving **A4.9 The procedures to be followed when working with regulated substances (as defined by Control of Poisons and Explosive Precursors Regulations 2015) and controlled drugs (as defined in the Misuse of Drugs Act 1971 and the Misuse of Drugs Regulations 2001):** • undertaking health and safety training • ensuring safe and secure storage, including storage requirements and restricting personnel access • undertaking inventory record-keeping • following sign-in/sign-out protocols **A4.10 The purpose of pressurised clean rooms and localised extraction and ventilation:** • protecting individuals and materials against contamination

What you need to teach
• protecting the external environment against contamination **A4.11 The purpose of the Control of Noise at Work Regulations 2005:** • specifies the level of noise at which employers must provide hearing protection when employees are exposed to noise on a daily or weekly basis (85 decibels) **A4.12 How employers can protect employees from noise:** • generating and ensuring compliance with risk assessments • providing PPE (for example, ear defenders) • providing regular health checks for employees, (for example, free hearing checks) **A4.13 Employers' responsibilities in relation to the Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR):** • find out what dangerous substances are in their workplace and what the risks are • put control measures in place to either remove those risks or, where this is not possible, control them • put controls in place to reduce the effects of any incidents involving dangerous substances • prepare plans and procedures to deal with accidents, incidents and emergencies involving dangerous substances • make sure employees are properly informed about and trained to control or deal with the risks from the dangerous substances • identify and classify areas of the workplace where explosive atmospheres may occur and avoid ignition sources (from unprotected equipment, for example) in those areas **A4.14 How to work safely in high risk environments or with substances that can cause harm to health, such as gases, explosive environments, lasers or ionising radiation:** • following risk assessments • following SOPs • adhering to regulations • undertaking appropriate training • wearing appropriate PPE • reporting all accidents, however minor **A4.15 The purpose of the Control of Electromagnetic Fields at Work Regulations 2016:** • specifies requirements for minimising risks of electromagnetic fields **A4.16 The consequences of using devices such as radios and mobile phones in the proximity of specific equipment and instrumentation:** • interference

What you need to teach
• effect on reliability of results • damage to the equipment (both the scientific instrumentation and the devices) **A4.17 How to decontaminate a range of common scientific equipment and substances:** • sterilisation (for example, autoclave, antisepsis, ultraviolet) • disinfection (for example, using hydrogen peroxide) • incineration (for example, clinical waste and sharps) • dissolution (for example, rinsing with a solvent in order to remove solid contaminants) • neutralisation (for example, spillage kits) **A4.18 The purpose of material safety data sheets and associated hazard and precautionary codes:** • contains the information necessary to allow employers to do a risk assessment, as required by the Control of Substances Hazardous to Health Regulations (COSHH), when handling certain chemicals **A4.19 The importance of ensuring that material data sheets are kept up to date, in line with relevant legislation, when:** • new hazard information, or information that may affect risk management measures, becomes available • a substance or mixture is classified according to the classification, labelling and packaging of substances and mixtures (CLP) Regulation • an authorisation under REACH is granted or refused • a restriction under REACH has been imposed

A5 Managing information and data within the health and science sector

What you need to teach
The student must understand: **A5.1 A range of methods used to collect data:** • focus groups • open question surveys/interviews • observation • public databases • journals and articles • carrying out practical investigations

What you need to teach

- closed question surveys
- official statistics

A5.2 The considerations to make when selecting a range of ways to collect and record information and data:

- data type: qualitative or quantitative data (for example, laboratory results versus patient history)
- the most appropriate method of data collection (manual versus automated)
- the most appropriate way to present the information or data (for example, graphs, charts and tables)
- depth of analysis required spreadsheets and databases
- the intended audience
- storage method (for example, digital or paper-based)

A5.3 The importance of accuracy, attention to detail and legibility of any written information or data in order to:

- comply with legal requirements (for example, UK General Data Protection Regulations (UK GDPR))
- limit liability (for example, ensuring anonymity and informed consent)
- provide an accurate account of events
- inform integrated working and data sharing
- ensure accurate analysis of findings
- support with audit trails
- ensure reproducibility of results

A5.4 The strengths and limitations of a range of data sources when applied in a range of health and science environments:

- results of investigations:
  - strengths (for example, consistent results produced under controlled conditions)
  - limitations (for example, possibility of over-extrapolation)
- patient history:
  - strengths (for example, provides detailed information over time)
  - limitations (for example, may not be accurate or complete)
- patient test results:
  - strengths (for example, laboratory and test accreditation ensures standardisation)
  - limitations (for example, results are open to subjectivity)
- published literature:

What you need to teach

- strengths (for example, peer review improves validity)
- limitations (for example, could be based on small-scale/biased research or come from fraudulent sources)

- real-time observation:
  - strengths (for example, immediate data)
  - limitations (for example, possible subjectivity)

A5.5 How new technology is applied in the recording and reporting of information and data:

- AI/machine learning (for example, use of bioinformatics tools to analyse and process large data sets)
- mobile technology and applications (for example, to capture health informatics and location data - track and trace)
- cloud-based systems (for example, use of electronic health records (EHRs) enables easier data sharing for further analysis)
- digital information management systems (for example, to enable a digital audit trail)
- data-visualisation tools (for example, to consolidate multiple data sources for presentation)

A5.6 How personal information is protected by data protection legislation, regulations and local ways of working/organisational policies:

- Data Protection Act 2018:
  - controls the use of personal information by organisations, businesses or the Government
- UK GDPR:
  - provides a set of principles with which any individual or organisation processing sensitive data must comply
- local ways of working/organisational policies to ensure compliance with legislation and regulations, depending on the sector:
  - ensuring that data is stored securely (electronically or paper-based)
  - restricting the use of mobile devices in order to ensure confidentiality
  - preventing potential conflicts of interest

A5.7 How to ensure confidentiality when using screens to input or retrieve information or data:

- logging out of a system when leaving the screen
- protecting login and password information
- being aware of the surroundings
- using secure internet connections
- using privacy screen filters where appropriate

What you need to teach

A5.8 The positive use of, and restrictions on the use of, social media in health and science sectors:

- positive uses:
  - awareness campaigns/disseminating information
  - correcting misinformation
  - crisis communication/monitoring
  - monitoring public health
  - data gathering
  - establishing support networks
  - recruitment
  - marketing
- restrictions:
  - not posting sensitive/personal information about oneself or others on social media, in line with an organisation's code of conduct
  - maintaining professional boundaries when interacting with individuals external to the organisation
  - sharing inaccurate/non-evidence-based information

A5.9 The advantages and risks of using IT systems to record, retrieve and store information and data:

- advantages:
  - ease of access
  - ease of sharing and transferring data
  - speed of data analysis
  - security (for example, password protected)
  - standardisation of data
  - enables continuous and/or real-time monitoring of data
  - cost and space saving
  - enables integrated working and supports safeguarding practices
- risks:
  - security breaches - accidental or malicious
  - potential for corruption of data
  - lack of access due to system failure

A5.10 How security measures protect data stored by organisations, by:

What you need to teach
• controlling access to information (for example, levels of authorised logins and passwords) • allowing only authorised staff into specific work areas • requiring regular and up-to-date staff training in complying with data security • making regular back-ups of files • using up-to-date cyber security strategies to protect against unintended or unauthorised access • ensuring that back-up data is stored externally (for example, cloud-based or separate servers) **A5.11 What to do if information is not stored securely:** • secure the information where possible • record and report the incident to the designated person, following organisational policies and procedures

A6 Data handling and processing

What you need to teach
The student must understand: **A6.1 The stages of data handling and processing:** • collect • record • analyse • interpret **A6.2 The difference between qualitative and quantitative data:** • qualitative - subjective, categorical data that approximates and characterises (for example, focus groups) • quantitative - objective, measurable data that can be defined as a value (for example, official statistics) **A6.3 The advantages and limitations of different methods of data storage and recording:** • physical lab notebooks: ○ advantages: ▪ safe from computer failure ▪ cannot be accessed by external hackers ▪ can be used in conditions that would be unsuitable for computers/tablets

What you need to teach

- limitations:
  - can be accessed by anyone in the workplace
  - can be altered without changes being tracked
  - cannot be easily shared or searched
  - can be lost, damaged and degraded over time
- laboratory information management systems LIMs - (electronic filing cabinet):
  - advantages:
    - enables data visualisation and reports
    - data is easily shared
    - can be searched
    - can be accessed remotely
    - cloud storage ensures safety from physical damage
    - highlights errors in the system or the data
  - limitations:
    - can be accessed by hackers, where IT security is not robust
    - vulnerable to technology failure
    - expensive
    - requires maintenance
    - requires an internet connection for synchronising

A6.4 The purposes of software systems used for data capture in scientific settings:

- capturing data specific to each scientific setting
- sharing with other scientists/stakeholders as appropriate
- securely storing commercially sensitive data
- enabling easy analysis and interpretation

A6.5 The difference between systematic and random data errors:

- systematic errors are consistent errors caused by flawed design, execution of experiments, or problems with equipment
- random errors are caused by unpredictable or unknown changes during an experiment (for example, interference on electronic equipment)

A6.6 How to minimise errors occurring in a scientific setting:

- using controlled variables

What you need to teach
• staff training and monitoring • maintenance and calibration of equipment • correctly storing materials • using automated processes • good experimental planning **A6.7 The different methods of data processing and analysis in science environments:** • tabulating raw data • using specialist software to analyse large data sets • graphical/statistical analysis • identifying trends in the data • drawing conclusions if appropriate **A6.8 Ways to present data in the appropriate format, including:** • table • scatter graph • line graph • bar chart • box and whisker plot • flow charts **A6.9 How to carry out the following statistical techniques when analysing data and their purpose :** • mean and median • standard deviation - to measure the dispersion of a set of values from the mean • range - to determine the difference between the lowest and highest values • Chi Square test - to test the significance of the difference between observed and expected results • T-test - to determine if there is a significant difference between the means of 2 groups • Spearman’s rank - to assess the correlation between 2 variables **A6.10 How to review data and make decisions based on that review:** • interpreting the statistical analysis against the original hypothesis/performance criteria • comparing data with predicted/similar results in published work • checking tolerance levels

What you need to teach
• deciding on next steps (for example, collection of more data, publishing, sharing results with the client) **A6.11 The consequences of bias in data analysis:** • inaccurate findings inferred from the results • wasted time and resources • damage to reputation • risks to health and safety **A6.12 How to prevent or reduce bias in data evaluation:** • ensuring sufficient sample size and appropriate sampling techniques • comparing to known standards and literature values • sending out results for peer review • using critical experts to independently review the data • blind analysis • using informatics tools to analyse data **A6.13 Links between sample size and effective statistical analysis:** • sample size determination is often constrained by factors such as cost, time, availability of samples and ethical considerations • sample size needs to be sufficient to provide adequate statistical power to reduce risks of error when accepting or rejecting an experimental hypothesis • different statistical analysis techniques take account of sample size by specifying the accuracy with which the results are returned **A6.14 How to order numbers by relative size in a data set, using:** • powers of 10 • decimal places **A6.15 How to ensure proportionality while scaling up or down quantities in a formulation:** • keeping the same factor (for example, multiply all quantities by a factor of 10)

A7 Ethics

What you need to teach

A7.1 The key aims of ethical scientific practices as outlined in 'Rigour, Respect, Responsibility: a Universal Ethical Code for Scientists 2007':

- to foster ethical research
- to encourage active reflection among scientists on the implications and impact of their work
- to support communication between scientists and the public on complex and challenging issues

A7.2 How to demonstrate integrity in a scientific setting:

- maintaining high quality ethical and professional standards (for example, objectivity, clarity, reproducibility)
- following organisational codes of practice
- following regulatory guidance
- aspiring to excel, not just meet the minimum standards

A7.3 The purpose of codes of practice within organisations:

- defines how employees can remain compliant with policies or legislation

A7.4 The importance of respect in the workplace:

- promoting equality and supporting diversity
- minimising conflict and stress
- increasing productivity and job satisfaction
- inspiring individuals to be loyal to the organisation and each other

A7.5 How intellectual property (IP) rights apply to scientific settings:

- patents
- trademarks
- copyrights

A7.6 What may be considered as IP within the science sector:

- theories/ideas
- papers/research
- experimental results and design
- bespoke equipment
- anything with a potentially commercial application (for example, product/formulation/recipe, software, apps)

A8 Good scientific and clinical practice

What you need to teach

The student must understand:

A8.1 The principles of good practice in scientific and clinical settings:

- using standard operating procedures (SOPs)
- effectively managing calibration and maintenance of equipment and work areas
- effectively managing stock
- appropriately storing products, materials and equipment

A8.2 What a SOP is:

- a set of sequential steps or instructions designed to standardise the approach to a process or action

A8.3 Why it is important for everyone to follow SOPs:

- maintaining health and safety
- enabling consistency of approach
- meeting any legal or organisational requirements
- upholding professional standards
- demonstrating compliance for audit purposes

A8.4 How to access SOPs for a given activity:

- carrying out detailed index searches (for example, via intranet/manual)
- completing detailed staff induction and ongoing training
- ensuring the SOP is the most up-to-date version
- ensuring all relevant documentation has been completed and signed

A8.5 The potential impacts of not regularly cleaning and preparing work areas for use:

- risks to health and safety:
  - spread of infection
  - production of toxic/dangerous by-products
- invalid results:
  - contamination or cross-contamination (for example, environmental, samples, reagents, DNA)
- inefficient working practices:
  - leads to increased costs and timescales
- damage to equipment:
  - leads to increased costs and timescales

What you need to teach

A8.6 The potential impacts of not maintaining, cleaning and servicing equipment:
• risks to health and safety:
  ○ increased risk of injury
  ○ spread of infection
• invalid results:
  ○ contamination or cross-contamination (for example, environmental, samples, reagents)
• reduced function of equipment:
  ○ decreased lifespan of equipment
  ○ increased cost and timescales (for example, due to repair of equipment and equipment being out of service)
A8.7 Why it is important to calibrate and test equipment to ensure it is fit for use:
• ensuring accuracy and reliability of measurements
• prolonging the life of equipment
• meeting legal requirements
A8.8 How to escalate concerns if equipment is not correctly calibrated/unsuitable for intended use:
• taking the equipment out of action
• labelling the equipment as being out of use, if appropriate
• reporting concerns to the relevant person, in line with organisational policies and procedures
• recording concerns according to organisational procedures
A8.9 Why it is important to order and manage stock:
• ensuring sufficient supply of required consumables and materials
• ensuring that materials are used before their expiry date
• reducing the costs of excess stock
• improving efficiency
• improving productivity
• ensure safety of stock (bottles aren't damaged/degraded)
A8.10 The potential consequences of incorrectly storing products, materials and equipment:
• cross-contamination
• breakdown of limited stability products
• products exceeding expiry dates

What you need to teach
• loss of samples or degradation of reagents not stored at the correct temperature (-20°C, -4°C, 4°C or room temperature) • risks to health and safety (for example, spread of infection, release of dangerous chemicals, or heavy items not stored at correct height) • stock is difficult to locate • financial loss

A9 Scientific methodology

What you need to teach
The student must understand: **A9.1 The importance of experimental design and planning when undertaking scientific experiments in order to:** • manage time efficiently (for example, ensuring that the minimum required number of measurements is carried out) • ensure sufficient resources (for example, checking supplies of required reagents, availability of equipment and personnel) • ensure safety throughout the experiment (for example, completing a risk assessment) • address ethical considerations (for example, justifying the necessity of an experiment) • minimise errors (for example, calibrating equipment in advance) **A9.2 The importance of a hypothesis/performance criteria, in experimental design:** • defining outcomes that can be tested • deciding on variables: o independent o dependent o controls • clarifying the experiment's objective **A9.3 How the following planning methodologies contribute to successful experimental design:** • objective setting: defines the purpose and outputs required • critical path analysis: maps out the key tasks in order, including dependencies • financial forecasting: defines what is feasible for a given budget

What you need to teach
• risk management: assessing and managing risks for the workforce • time management: defines timescales and workflows **A9.4 How customer/client requirements may affect the scientific methodology by:** • defining timescales • setting a budget • specifying scale (for example, number of replicates and sample size) • specifying objectives **A9.5 How to provide results and recommendations in appropriate formats to customers/clients:** • answering the brief/research questions • tailoring language and technical information to the audience • selecting the most appropriate way of presenting data (for example, visualisations/infographics) • highlighting the commercial/business benefits for the customer/client **A9.6 How to access and critically evaluate scientific literature and research databases, taking into account:** • searching for relevant existing scientific research/literature: o selecting relevant databases o choosing key terms and phrases for which to search • the differences between primary and secondary sources: o primary sources: direct access to the original information (for example, journal articles) o secondary sources: an interpretation of information from a primary source (for example, commentary from a researcher) • age/relevance of literature • reliability of sources (for example, conflicts of interest, citations, impact factor) • reliability of data (sample sizes, collection method used) **A9.7 The principles that inform sampling techniques:** • avoiding bias • ensuring a large enough sample size to produce valid results • practical constraints (for example, timescales, costs) **A9.8 A range of techniques for measuring scientific subject matter at micro and macro scales:** • mass (for example, balances to different decimal places) • length (for example, eyepiece graticule, laser measure)

What you need to teach
• volume (for example, micro or graduated pipette) **A9.9 The need for reliable, verifiable, and accurate recording in order to ensure that:** • data or information is repeatable • data or information is relevant to the experimental purpose (valid recording) • data or information truly reflects the results obtained (accurate recording) **A9.10 How to use the following step-by-step process to isolate and solve problems or inconsistencies in scientific data:** • identify and define the problem • investigate and examine possible causes • decide on changes to be made • implement the changes • evaluate the impact and continue to monitor any changes **A9.11 How to evaluate a scientific methodology and make recommendations for improvement, including:** • reflecting on experimental design • assessing the reliability of methods, and precision, accuracy, repeatability and reproducibility of results • identifying areas for improvement • making recommendations for future improvement **A9.12 The purpose of International Organisation for Standardisation (ISO) standards in scientific settings:** • enables accredited laboratories to demonstrate competency and validity through collaborative testing • facilitates cooperation between organisations by generating wider acceptance of results • improves international trade as test reports and certificates can be accepted from one country to another without the need for further testing • specifies the general requirements for the competence to carry out tests and/or calibrations, including sampling

A10 Experimental equipment and techniques

What you need to teach
A10.1 Common causes of equipment and technical faults that may have an impact on scientific results:

What you need to teach

- user error
- setting-up errors
- poor maintenance (including calibration)
- electrical faults

A10.2 The requirements for positive and negative controls in identifying faults:

- positive control - produces a known result so can be used to ensure that any negative results are true negatives and not a result of an issue with equipment or reagents
- negative control - confirms that no other variable is responsible for positive results in the test

A10.3 Applications of the following equipment when undertaking scientific techniques:

- autoclaves: to decontaminate/sterilise equipment and some consumables
- centrifuges: to separate suspensions
- cryogenic equipment: to produce exceptionally low temperatures
- data loggers: for the collection, storing, and recording of data over a period of time
- digital (for example, mechanical) and non-digital (for example, volumetric) pipettes: to accurately measure and transfer solutions
- fume cupboards: as a safety measure to capture and remove airborne hazards
- glassware: to store, measure, transfer and collect reagents and samples
- glove boxes: to provide a contained and controlled environment (sealed atmosphere) for manipulating samples, substances, and objects
- incubators: to provide a controlled and accurately maintained environment (for example, temperature, humidity)
- microbiological equipment: to perform a range of microbiological techniques whilst maintaining an aseptic environment
- multimeter: a meter than can measure voltage, current and therefore resistance in a circuit
- pH meters: to measure pH (for example, how acidic or alkaline a substance is)
- refrigerators and freezers: to provide a controlled and accurately maintained temperature
- scientific balances: to accurately determine the mass of a sample, including small samples
- thermometer: to monitor temperature or temperature changes

A10.4 The appropriate techniques for handling a range of different substances (for example, solids, liquids and gases), including:

- referring to material safety data sheets (for example, for corrosive substances)
- using personal protective equipment (PPE) (for example, using gloves to handle phenol)

What you need to teach
• using equipment for safe handling (for example, using tongs to handle alkali metals) • applying containment controls (for example, using a fume cupboard when producing any chlorine) • procedures for dealing with compressed gases (for example, storing at the correct temperature) **A10.5 Appropriate equipment to measure accurate results for the following scales:** • kilo (for example, balance) • milli (for example, analytical balance) • micro (for example, micrometer) • nano (for example, atomic clock) **A10.6 How to use a light microscope, including:** • preparing slides using different staining techniques (for example, Gram staining) • altering magnification and focus • setting scale, using an eyepiece graticule • cell counting, using a haemocytometer **A10.7 The reasons for using aseptic techniques, including:** • to avoid contamination of products (for example, food production) • to avoid transmission of disease (for example, from samples to individuals/animals) **A10.8 How to follow aseptic techniques:** • flaming equipment (for example, wire loop, necks of bottles and test tubes) • transfer cultures/samples as quickly as possible with minimal exposure to the air • holding bottles and tubes at an angle to prevent contamination • sterilising tools (autoclaving, radiation, chemical sterilisation) • working in a sterile air environment (for example, in a downflow cupboard, close to a blue flame Bunsen burner) • refraining from contaminating any sterile objects by placing them on non-sterile surfaces • not consuming food or drink • following correct handwashing techniques • donning and doffing suitable clothing and PPE • preparing surfaces and equipment (for example, cleaning down surfaces and only having the necessary equipment available) • minimising human traffic in the area • reducing draughts by closing windows/doors

Core component section B: science concepts

B1 Core science concepts

What you need to teach

The student must understand:

Cells and tissues

B1.1 The 3 principles of cell theory:

- all living things are made up of one or more cells
- cells are the most basic unit of structure and function in all living things
- all cells are created by pre-existing cells

B1.2 The different types of cells that make up living organisms:

- eukaryotic cells (for example, plant, yeast, algae and animals)
- prokaryotic cells (for example, bacteria)

B1.3 The structure and function of the organelles found within eukaryotic cells including:

- cell-surface membrane
  - control of passage of substances into and out of the cell
  - site of antigens
- nucleus
  - contains chromosomes
- mitochondria
  - respiration producing adenosine triphosphate (ATP)
- ribosomes
  - protein synthesis / translation
- rough and smooth endoplasmic reticulum
  - protein synthesis and packaging
  - lipid synthesis and storage
- Golgi apparatus and Golgi vesicles
  - packaging of proteins for transport
- centrioles
  - involved with separation of chromosomes during cell division
- lysosomes

What you need to teach

- digestion / breakdown of worn out cell parts and invading microbes
- chloroplasts (in plants)
  - photosynthesis
- cell wall (in plants)
  - structure and protection
- cell vacuole (in plants)
  - store water and maintain internal hydrostatic pressure

B1.4 The similarities and differences between plant and animal cells in relation to the presence of specific organelles and their function:

- overall cell shape
- presence of the same organelles
- presence of different organelles for specialised functions (for example, chloroplasts)

B1.5 How eukaryotic cells become specialised in complex multi-cellular organisms:

- eukaryotic cells are specialised to perform particular functions
- specialisation occurs through differentiation from stem cells
- examples of specialised cells, such as different types of blood cell

B1.6 How prokaryotic cells differ from eukaryotic cells:

- they have cytoplasm that lacks membrane-bound organelles
- they have smaller ribosomes
- they have no nucleus; instead, they have a single circular DNA molecule that is free in the cytoplasm and is not associated with proteins
- they have a cell wall that contains murein/peptidoglycan, a glycoprotein
- they may have one or more plasmids
- they may have a capsule surrounding the cell
- they may have one or more simple flagella

Proteins

B1.7 The relationship between the structure, properties and functions of proteins:

- amino acids are the small molecules (monomers) from which all proteins are made
- amino acids contain NH_2 which is the amine group, COOH represents a carboxyl group and R represents a side chain
- there are twenty amino acids common in organisms, each differs by the side chain (R)

What you need to teach

- dipeptides are formed by the condensation of 2 amino acids
- polypeptides are formed by the condensation of many amino acids
- functional proteins, such as fibrous proteins or globular proteins, contain a number of polypeptide chains which will determine the shape and size and function

Carbohydrates

B1.8 The relationship between the structure, properties and functions of carbohydrates:

- monosaccharides are the small molecules (monomers) from which all larger carbohydrates are made (disaccharides and polysaccharides)
- glucose, galactose and fructose are common monosaccharides
- disaccharides are formed from 2 monosaccharides (for example, maltose and sucrose)
- polysaccharides are formed from many monosaccharide molecules
- as polysaccharides are such large molecules, they are usually insoluble which makes them suitable to carry out storage and support functions (for example, glycogen, starch and cellulose)

Lipids

B1.9 The relationship between the structure, properties and functions of lipids:

- lipids are a diverse group of substances which all contain carbon, hydrogen and oxygen
- they are generally insoluble in water
- the main groups of lipids are triglycerides (for example, fats and oils) and phospholipids
- the main role of phospholipids is in plasma membranes to provide flexibility and transport mechanisms
- other roles of lipids include providing an energy store, insulation and protection

Exchange and transport mechanisms

B1.10 How the surface area to volume ratio affects the process of exchange and gives rise to specialised systems:

- the surface area must be large in comparison to the volume for efficient exchange
- where the surface area is small compared to the volume, specialised exchange and transport mechanisms are required to maximise the rate of diffusion
- additional factors, such as diffusion distance, temperature and metabolic rate

B1.11 The principles of cellular exchange and the transport mechanisms which exist to facilitate this exchange:

- the structure of the cell surface membrane with reference to the fluid mosaic model
- passive transport through the cell surface membrane: diffusion, facilitated diffusion and osmosis

What you need to teach
• active transport through the cell surface membrane • co-transport mechanisms **B1.12 The advantages of having specialised cells in relation to the rate of transport across internal and external membranes.** **Genetics** **B1.13 The purpose of deoxyribonucleic acid (DNA) and ribonucleic acid (RNA) as the carrying molecules of genetic information and the role they play in the mechanism of inheritance:** • DNA holds genetic information • RNA transfers genetic information from DNA to the ribosomes where proteins are synthesised **B1.14 The relationship between the structure of DNA and RNA and their role in the mechanism of inheritance:** • nucleotides are the molecules (monomers) from which DNA and RNA are formed • each nucleotide is formed from pentose, a nitrogen containing organic base and a phosphate group • the components of a DNA nucleotide are deoxyribose, a phosphate group and one of the organic bases adenine, cytosine, guanine or thymine • the components of an RNA nucleotide are ribose, a phosphate group and one of the organic bases adenine, cytosine, guanine or uracil • a condensation reaction between 2 nucleotides forms a phosphodiester bond • a DNA molecule is a double helix with 2 polynucleotide chains held together by hydrogen bonds between specific complementary base pairs • an RNA molecule is a relatively short single stranded polynucleotide chain **B1.15 The function of complementary base pairing in forming the helical structure of DNA.** **B1.16 The process and stages of semi-conservative replication of DNA:** • DNA is progressively unwound • breakage of the hydrogen bonds between complementary bases • this leaves 2 chains with unpaired bases • each chain then acts as a guiding base (or template) for the building of a new strand • role of DNA helicase and DNA polymerase in this process **B1.17 How this semi-conservative replication process ensures genetic continuity between generations of cells.** **B1.18 The link between the semi-conservative replication process and variation:** • a mutation (spontaneous change in the DNA sequence) can lead to genetic variation

What you need to teach

B1.19 The difference between genetics and genomics:

- genetics focuses on the functioning and composition of single genes
- genomics focuses on the entire genetic material of an organism (including coding and non-coding DNA)

Microbiology

B1.20 The classification and characteristics (size of cell, type of cell, presence of organelles) of the following microorganisms:

- bacteria
- fungi
- parasites
- viruses

B1.21 The benefits of using the following microscopes when investigating microorganisms:

- light microscopes:
  - low cost
  - easy to use - requires little training
  - allows for examination of living microorganisms
- scanning electron microscopes:
  - higher resolution
  - reveals more surface detail
  - displays a 3D view of the surface
- transmission electron microscopes:
  - higher resolution
  - reveals internal structures
  - displays a 2D view of the inner surface

B1.22 How to calculate magnification from the size of the image and the size of the object:

- magnification = $\frac{\text{size of image}}{\text{size of object}}$

B1.23 The uses of differential staining techniques:

- Gram staining:
  - to identify Gram- and Gram+ bacteria
- Giesma staining:
  - to identify specific bacteria (for example, *Chlamydia trachomatis*) or parasites (malarial)

What you need to teach
○ to identify any pathophysiology of blood cells • haematoxylin and eosin staining: ○ staining human or animal tissue in order to give a differentiated image of the nuclear and cytoplasmic components of a cell **Immunology** **B1.24 The nature of infection:** • a microorganism replicating inside the body, resulting in disease **B1.25 Pathogens (causative agents) of infection and examples of resulting diseases:** • bacteria (for example, chlamydia, gonorrhoea, tuberculosis) • viruses (for example, common cold, mumps and measles) • fungi (for example, yeast infection (thrush)) • prions (for example, Creutzfeldt-Jakob disease (CJD)) • protists (for example, malaria) • parasites (for example, toxoplasmosis) **B1.26 The different ways in which pathogens (causative agents) may enter the body (for example, transmission routes):** • direct transmission: ○ physical contact with an infected person or contaminated surface (for example, skin-to-skin contact) ○ sharing of needles ○ unprotected sexual contact ○ airborne: pathogens (causative agents) is carried by dust or droplets in the air, can exist in the air for some time (for example, inhaling infected droplets) • indirect transmission: ○ vehicle transmission (for example, ingesting infected food or water (faecal-oral)): blood from inanimate objects (for example, bedding) ○ being bitten by an infected 'vector' (for example, insect bites) **B1.27 How infectious diseases can spread amongst populations and communities:** • inadequate sanitation (for example, lack of access to clean water and inadequate sewage disposal) • dense populations (social distancing) • inadequate healthcare/infrastructure • lack of accessible health promotion information

What you need to teach

B1.28 The definition of an antigen and an antibody:

- antigen - a substance that is recognised by the immune system as self or non-self and stimulates an immune response
- antibody - a blood protein produced in response to, and counteracting, a specific antigen

B1.29 The link between antigens and the initiation of the body's response to invasion by a foreign substance:

- antigens as chemical markers
- ability of the body to recognise self and non-self antigens

B1.30 The stages and cells involved in the body's response to an antigen, including:

- use of physical and chemical barriers
- inflammation
- phagocytosis
- actions of T cells
- actions of B cells

B1.31 The differences between cell-mediated immunity and antibody-mediated immunity including:

- cell-mediated response is associated with T lymphocytes destroying pathogens (causative agents) without producing antibodies
- antibody-mediated response is associated with B lymphocytes destroying pathogens (causative agents) by producing antibodies against it

B1.32 The role of T and B memory cells in the secondary immune response:

- they trigger a stronger and more rapid immune response after encountering the same antigen
- role of vaccinations in relation to T and B memory cells

Materials and chemical properties

B1.33 The relationship between the atomic structure and physical and chemical properties of metals, including:

- physical properties:
  - conductivity (electrical and thermal)
  - malleability/ductility
  - strength
- chemical properties:
  - group 1:
    - reactivity of group 1 metals with water and oxygen

What you need to teach

        - reactivity of group 1 metals in terms of their electronic configurations
    - transition metals:
        - reactivity of transition metals with oxygen and acids
        - the difference in properties of transition metals compared with group 1 metals in their melting points, densities, strength, hardness and reactivity with oxygen, chlorine and water
- the relationship between the structure and properties of the following materials:
    - composite materials (for example, concrete, fibreglass and carbon fibre):
        - structure - made of 2 or more materials with different properties to combine those properties into one material
        - properties - strong, lightweight
    - ceramics (for example, clay and glass):
        - structure - moulded and then baked to form strong bonds between atoms in the structure
        - properties - hard, strong under compression, chemically unreactive
    - polymers (for example, high density (HD) and low density (LD) polyethene, thermosetting and thermosoftening polymers):
        - structure - long chain molecules with forces or bonds between the chains
        - properties - strong, chemically unreactive, electrical insulators
- how the properties of these materials are related to their uses

B1.34 How the arrangement of electrons is linked to the way in which elements are situated within groups in the periodic table:

- elements with the same number of electrons in the outer shell are in the same group of the periodic table

B1.35 The correct names for sub-atomic particles and their position in an atom - protons, electrons and neutrons:

- protons - found in the nucleus
- neutrons - found in the nucleus
- electrons - found in orbitals around the nucleus

Acids/bases and chemical change

B1.36 The physical and chemical properties of acids:

- irritant or corrosive
- neutralise bases
- react with metals to form H_2

What you need to teach

- pH less than 7

B1.37 The concept of strong and weak acids (as distinct from dilute and concentrated solutions):

- strong acids are completely dissociated in aqueous solution (for example, sulfuric, hydrochloric and nitric acids)
- weak acids are only partially dissociated in aqueous solution (for example, ethanoic and carbonic)
- for a given concentration of aqueous solution, the stronger the acid, the lower the pH
- as the pH of an acid decreases by one unit, the hydrogen ion concentration of the solution increases by a factor of 10

B1.38 How to determine the name of the salt produced in the following acid-base reactions:

- acid + base → salt + water (for example, HCl + NaOH → NaCl + H2O)

Rates of reaction and energy changes

B1.39 The principles of collision theory:

- molecules must collide
- molecules must collide with enough energy to break and reform bonds (activation energy)
- molecules must be in the correct spatial orientation

B1.40 The effect of temperature on rates of reaction:

- an increase in temperature makes molecules move faster, resulting in increased collisions and rates of reaction
- lower temperatures result in decreased collisions and rates of reaction

B1.41 The definition of a catalyst and the role of catalysts in a reaction:

- catalysts are substances that increase the rate of a chemical reaction without themselves being permanently chemically changed
- principles of reaction kinetics Maxwell-Boltzmann distribution curve

Chemical analysis of substances

B1.42 The principles of the following tests and techniques used to separate substances in order to detect or identify chemical composition:

- thin layer chromatography:
  - used to separate non-volatile mixtures based on their affinity for a mobile (solvent) or stationary phase (on a coated plate)
  - used to detect the number of components
  - used to identify the compounds and their purity
- column chromatography:

What you need to teach

- used to separate a single chemical compound from a mixture (in a vertical column)

- gas chromatography:
  - used to separate and analyse compounds that can be vaporised (in a capillary or packed column)
- high performance liquid chromatography:
  - used to separate substances based on their affinity for a mobile (pressurised solvent) or stationary phase (in a capillary or packed column)
- mass spectrometry:
  - used to separate substances due to their mass to charge ratio and to identify molecular ions and ion fragments
  - used to identify the components of an unknown sample due to their molecular weights

B1.43 The tests that could be used to quantify components in a mixture:

- gas chromatography
- high performance liquid chromatography
- mass spectrometry

B1.44 The principle of titration:

- determining the volumes of acids and alkalis required for neutralisation to occur

Electricity

B1.45 The definitions of, and how to calculate, charge and current using Q = It

B1.46 The definitions of, and how to calculate, current, potential difference and resistance, using Ohm's law V = IR

B1.47 How to calculate total resistance of multiple fixed resistors in a series and parallel circuit:

- series: the total resistance is equal to the sum of the individual resistors
- parallel: $\frac{1}{R} = \frac{1}{R1} + \frac{1}{R2} + \frac{1}{Rn}$

B1.48 The difference between alternating and direct current.

B1.49 The properties of mains electricity in the United Kingdom:

- alternating current
- potential difference ensures electricity is supplied to residences and businesses at 230 volts
- generated at a frequency of 50Hz

Magnetism and electromagnetism

B1.50 Magnetism and magnetic poles:

- north and south magnetic poles are where the magnetic forces are strongest

What you need to teach

- attraction/repulsion of magnets in close proximity - attraction and repulsion between magnetic poles are examples of non-contact forces
- the difference between permanent and induced magnets
- the uses of permanent and temporary magnetic materials (for example, iron, steel, cobalt, nickel)

B1.51 Magnetic fields:

- the shape and direction of the magnetic field around bar magnets, and the relationship between the strength of the field and concentration of field lines
- how a magnetic field is produced by the flow of current through conducting wire, including the relationship between:
  - strength of the field
  - size of the current
  - distance from the wire

B1.52 The uses of electromagnetism and electromagnets:

- portative and tractive electromagnets
- principles of electromagnetic induction - the production of voltage
- principles of the motor effect - causing movement in a motor
- applications of electromagnets in electric and electromechanical devices (for example, transformers, induction heating, MRI machines)

Waves

B1.53 The definition of a wave:

- the transfer of energy, not matter

B1.54 The relationship between frequency, wavelength and speed using the wave equation $v = f\lambda$.

B1.55 The properties of longitudinal and transverse waves:

- longitudinal waves move in the same direction in which the particles are vibrating
- transverse waves move in a direction at right angles to the way in which the particles are vibrating

B1.56 The uses of different types of waves:

- communication (for example, radio waves)
- medical uses (for example, x-rays for imaging, gamma rays for cancer treatment and sterilisation, ultrasound in scanning and cleaning laboratory equipment)
- food processing (for example, infrared heating and microwave heating)

Particles and radiation

B1.57 The types and properties of ionising radiation:

What you need to teach

- alpha:
  - high ionising but low penetrating power
  - range is 1 to 2 centimetres of air
- beta:
  - medium ionising and penetrating power
  - range is approximately 15 centimetres of air
- gamma:
  - low ionising and high penetrating power
  - range is many kilometres of air

B1.58 The definitions of half-life and count-rate:

- half-life - the time taken for half the unstable nuclei in a sample to decay
- count-rate - the number of decays recorded each second

B1.59 The main types of radioactive decay in relation to unstable nuclei:

- an alpha particle - consists of 2 neutrons and 2 protons and is equivalent to a helium nucleus
- a beta particle - a high speed electron ejected from the nucleus as a neutron turns into a proton
- a gamma ray - electromagnetic radiation from the nucleus

B1.60 How radiation interacts with matter:

- ionisation - by causing electrons to break apart from atoms or molecules
- excitation - by transferring energy to atoms or molecules

B1.61 The applications of radioactivity within the health and science sector:

- radioactive tracers
- medical diagnostic applications
- food preservation
- dating deceased organisms

Units

B1.62 The use of the international system of units (SI):

- ampere (A) - electric current
- candela (cd) - luminous intensity
- kelvin (K) - temperature
- kilogram (kg) - mass

What you need to teach
• metre (m) - length • mole (mol) - amount of substance • second (s) - time **B1.63 How to convert between units:** • millimetres to metres • milligrams to grams • millilitres to litre **B1.64 The importance of using significant figures and science notation:** • makes calculations with large or small numbers less cumbersome • reduces the chances of data errors

B2 Further science concepts

What you need to teach
The student must understand: **Classification of biological molecules** **B2.1 The molecular structures and functions of the following:** • proteins: o the role of hydrogen bonds, ionic bonds and disulfide bridges (a covalent bond) in the structure and shape of proteins and their relation to R groups of the amino acid monomers o the relationship between primary, secondary, tertiary and quaternary structure and protein property and function o globular proteins - formed of long chains which are arranged in a variety of coiled shapes. This diversity of shapes reflects the range of functions performed by these proteins, such as binding, signalling and transport (for example, enzymes and haemoglobin) o fibrous proteins - formed of long chains which run parallel, linked by cross bridges to form stable molecules to act as structural polymers (for example, collagen) • carbohydrates: o the basic units of carbohydrates are monosaccharides. Monosaccharides are composed of carbon, hydrogen and oxygen. Examples of monosaccharides include: glucose, fructose and galactose o when combined in pairs, monosaccharides form disaccharides through a condensation reaction and the formation of glycosidic bonds

What you need to teach

- polysaccharide can be made from different isomers of the same monosaccharide or by the combination of different monosaccharides (for example, glycogen and starch are formed by the condensation of alpha (α) glucose and cellulose is formed by condensation of beta (β) glucose)

- lipids:
  - fatty acids and glycerol are the molecules from which triglycerides and phospholipids are formed
  - triglycerides are formed by the condensation of 1 molecule of glycerol and 3 molecules of fatty acid
  - phospholipids are formed when one of the fatty acids of a triglyceride is substituted by a phosphate-containing group
  - fatty acid molecules repel water (hydrophobic) and glycerol molecules attract water (hydrophilic)
  - phospholipid is made up of 2 parts, a hydrophilic head and a hydrophobic tail. This molecular structure forms a bi-layer that is important for all membrane functions
- nucleic acid:
  - nucleic acids are large molecules composed of nucleotides
  - each nucleotide in DNA is made up of a sugar (deoxyribose), a phosphate and an organic base
  - DNA is made up of 2 strands of nucleotides joined together by hydrogen bonds. The nucleotides form a double helix structure
  - DNA provides genetic information

Enzyme and protein structure

B2.2 The role of DNA bases in the production of amino acid chains, which form proteins, including:

- a gene is a sequence of nucleotides along a strand of DNA, each nucleotide consists of a sugar molecule attached to a phosphate group and a nitrogen-containing base
- nucleotides comprise ribose sugar, phosphate and a base which can be guanine (G), cytosine (C), adenine (A) and thymine (T)
- the order of bases along a single strand constitutes the genetic code. A sequence of 3 DNA bases is known as a triplet or a codon. Each codon codes for a specific amino acid or a start or stop codon
- the genetic code is universal, non-overlapping and degenerate, meaning that each amino acid can be coded for by more than one codon
- the sequence of bases within a gene specifies the sequence of amino acids that are linked together to form a polypeptide chain

B2.3 How the process of protein synthesis occurs:

- DNA acts as a template providing the instructions for the synthesis of each protein from specific amino acids via the coding sequence of bases
- a complementary section of part of this sequence is made into messenger RNA (mRNA) by a process known as transcription

What you need to teach

- the messenger RNA acts as a template to which complementary transfer RNA (tRNA) molecules attach and the amino acids they carry are then linked to form a polypeptide by a process known as translation
- in RNA thymine is replaced by uracil (U)

B2.4 The properties of enzymes that are determined by their tertiary structure, including:

- the shape of the active site
- the role of bonding
- the effect of pH and temperature

B2.5 How enzymes' mechanism of action allows them to catalyse a wide range of intracellular reactions including:

- models of lock and key hypothesis
- the effect of enzyme concentration and substrate concentration
- induced fit

Cell cycle

B2.6 The function of both mitosis and meiosis in nuclear division within cells:

- mitosis produces 2 daughter nuclei that have the same number of chromosomes as the parent cell and each other (diploid)
- meiosis produces 4 daughter nuclei each with half the number of chromosomes (haploid) of the parent cell
- mitosis division results in each of the daughter cells having an exact copy of the DNA of the parent cell
- meiosis produces cells that are not genetically identical, and plays an important role in bringing about variation in living organisms

B2.7 How the process of mitosis results in the formation of 2 genetically identical daughter cells:

- interphase: stage that always proceeds mitosis when DNA and organelles are replicated
- characteristics of each of the stages of mitosis, including the behaviour of chromosomes and the cellular structure at each stage:
  - prophase: stage in which chromosomes become visible and the nuclear envelope disappears
  - metaphase: stage in which the chromosomes arrange themselves at the centre of the cell
  - anaphase: the stage in which each of the 2 threads of a chromosome (chromatid) migrates to the opposite pole
  - telophase: stage in which the nuclear envelope reforms to produce 2 daughter cells

What you need to teach

B2.8 How the process of meiosis, including phase 1 and phase 2, results in the formation of haploid gametes from diploid cells in the reproductive organs:

- meiosis takes place in the reproductive organs to form haploid gametes (cells that unite to form a new organism)
- it is necessary to have haploid gametes to maintain a constant number of chromosomes from one generation to the next
- meiosis involves 2 stages or divisions (meiosis I and meiosis II), such that each diploid cell divides to produce 4 haploid gametes
- in meiosis I the chromosome number is halved and the process of 'crossing over' takes place
- crossing over (or genetic recombination) is the process where homologous chromosomes pair up with each other and exchange different segments of genetic material to form a recombinant chromosome
- the process of crossing over, where genetic material is exchanged creates genetic variation
- the second stage of meiosis is identical to mitosis

B2.9 The significance of the differences between mitosis and meiosis:

- as mitosis produces genetically identical cells to parent cells it is used to grow new cells from the original which always have the same set of genetic information
- as cells produced by the process of mitosis are identical, the production of new differentiated cells results in cells and tissues that perform the function they were intended to perform
- if cells are damaged or die, it is important that new cells produced have identical structure and function to the cells that have been lost, mitosis is therefore the process by which new cells replace damaged or dead ones
- meiosis occurs only in reproductive cells to ensure that the cells produced have half (haploid) number of chromosomes to ensure when gametes (for example, eggs and sperm) combine the resulting zygote (fertilised egg) has the correct number of chromosomes (diploid)
- the 2 stages of meiosis (rather than the one stage of mitosis) results in genetic variation within daughter cells compared to the parent cells

Cellular respiration

B2.10 How respiration results in the breakdown of glucose to produce the energy-carrying molecule Adenosine Triphosphate (ATP):

- aerobic respiration - the chemical breakdown of substrate molecules (for example, glucose) in cells to release energy in the form of ATP when oxygen is present
- involves a series of oxidation and reduction reactions
- glucose + oxygen → carbon dioxide + water (produces ATP) $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O$ (produces ATP)

B2.11 How ATP provides a source of energy for biological processes:

What you need to teach

- Adenosine Triphosphate (ATP) consists of an adenosine molecule bonded to 3 phosphate groups in a row
- the bond between the phosphate groups in ATP are easily hydrolysed to form ADP and inorganic phosphate, with energy released in this reaction
- this reaction is catalysed by the enzyme ATPase
- ATP + water = ADP + P_i (energy released)

B2.12 The comparative amounts of energy produced by different respiratory substrates (lipids, proteins and carbohydrates).

Pathogens (causative agents)

B2.13 The definition of a pathogen:

- a biological agent that causes illness or disease by damaging host tissues and/or by producing toxins

B2.14 Examples of different types of pathogens (causative agents) and the diseases they can cause:

- bacteria:
  - Escherichia coli (E. coli) causes gastrointestinal disorders
- fungi:
  - Candida auris (C. auris) causes fever and possible sepsis
- prions:
  - proteins that can cause prion diseases, (for example, Creutzfeldt-Jakob disease (CJD))
- protists:
  - Plasmodium sp. that cause malaria
- viruses:
  - hepatitis A virus (HAV) causes hepatitis A

Formulae and equations

B2.15 How to balance a given equation based on the following reactions:

- group 1 metals with water and oxygen
- transition metals with oxygen and strong acids (hydrochloric, sulfuric and nitric acid)

B2.16 How an empirical formula represents the simplest ratio of atoms of each element in a compound:

- C_2H_5 is a 2:5 ratio

B2.17 How to use the empirical formula and relative molecular mass to work out the molecular formula of a compound:

- divide the relative molecular mass by the mass of the atoms in the empirical formula

What you need to teach

- multiply the ratio to arrive at the formula

B2.18 The definition of an isotope and relative isotopic mass:

- isotopes are atoms of the same element with different masses due to a different number of neutrons (for example, C^{12} and C^{13})
- relative isotopic mass is the mass of an atom of an isotope relative to 1/12 of the mass of a C^{12} atom

B2.19 The link between balanced equations and the ratio of moles of a substance in a reaction (for example, $2CH_4$ is 2 moles).

B2.20 The relationship between the number of moles of solute and the volume in dm^3 of solvent as a measure of concentration (mol/dm^3).

Kinetic changes

B2.21 A range of factors affecting the rates of chemical reactions:

- surface area
- temperature
- concentration
- pressure

B2.22 How to calculate the rate of reaction: $\frac{\text{amount of reactant or product}}{\text{time}}$

B2.23 The definition of activation energy:

- the minimum amount of energy required to start a reaction

B2.24 The action of a catalyst, in terms of providing an alternative pathway with a lower activation energy.

B2.25 The advantages of using a catalyst in industrial reactions:

- the increase in the rate of reaction gives a faster turnaround time and so reduces costs
- reducing the activation energy reduces costs and energy consumption

B2.26 How to use the Maxwell Boltzmann distribution of molecular energies to explain, qualitatively, how changes in temperature and the presence of a catalyst affect the rate of a reaction.

Analytical techniques

B2.27 How chromatography can be used to separate substances due to their attraction to the mobile or stationary phase.

B2.28 How to calculate and use the Rf value to identify a substance:

- the distance travelled by the substance divided by the distance travelled by the solvent
- the Rf value should be the same if it is the same substance (under the same conditions)

What you need to teach

B2.29 The stages of an acid-base titration, including the role of the following indicators in determining the end point:

- phenolphthalein
- methyl orange

B2.30 The following applications of chromatography in industry:

- forensic investigation (for example, to detect the presence of substances like alcohol within human tissue)
- water analysis (for example, to determine the presence of pesticides in rivers)

B2.31 The following applications of chromatography and titration in industry:

- used in quality control (for example, to test food products for consistency)
- purity analysis (for example, to test raw materials for the chemical industry)

Gas laws

B2.32 How the following gas laws describe the behaviour of gases in particular conditions:

- Boyle's Law ($P_1V_1 = P_2V_2$)
- Charles's Law ($V_1T_2 = V_2T_1$)
- the Pressure Law ($P_1/T_1 = P_2/T_2$)

B2.33 The use of the kelvin temperature scale in describing the behaviour of gases in particular conditions, including:

- the effect of a temperature of absolute zero on the movement of particles

B2.34 The effect of compression when storing gases in cylinders:

- high pressure could be hazardous due to risk of explosion or leakage
- changes to temperature can affect the pressure
- cylinders must be stored at a determined temperature range

Pressure/fluid/viscosity

B2.35 The definitions of:

- density - mass per unit volume
- pressure - force per unit area
- fluid - a substance that is capable of flowing, with no fixed shape
- viscosity - a measure of resistance (internal friction) of a fluid (for example, high viscosity = low flow)

B2.36 The properties of Newtonian and non-Newtonian fluids, as defined by Newton's law:

- Newtonian - a fluid whose viscosity remains constant as the applied force changes

What you need to teach
• non-Newtonian - a fluid whose viscosity does not remain constant as the applied force changes **B2.37 How depth affects hydrostatic pressure in a liquid (an increase in depth causes an increase in pressure).** **B2.38 The definitions of volumetric and mass flow rates:** • volumetric flow rate - the volume of a fluid moving through a given area per unit of time • mass flow rate - the mass of a fluid moving through a given area per unit of time **B2.39 The difference between steady and turbulent flow:** • steady flow is when all parts of a fluid have the same velocity at a certain point • turbulent flow is when different parts of the fluid have a different velocity **B2.40 The coefficient of viscosity of a fluid:** • a measure of the resistance to flow of a fluid

Core skills

The employer-set project (ESP) requires that students apply and contextualise core knowledge through the demonstration of the following core skills. Parameters have been provided for each skill in order to define what students must be able to demonstrate to fully satisfy the requirements of the ESP.

CS1 Project management

What you need to teach:

The student must be able to:

CS1.1 Independently produce a high-level project plan, written in a clear, unambiguous way and taking into account the document's purpose, including:

- project deliverables:
  - including a project scope statement that clearly and concisely outlines the intended outcomes
  - opportunities and benefits
- project inputs:
  - people (for example, customers/clients)
  - products and materials (for example, samples, raw materials)
  - equipment
- a timetable of activities, providing the appropriate level of detail to reflect the project's purpose, including:
  - total time required for the overall project
  - a breakdown of time required for individual scientific activities
  - important milestones
  - resource availability (for example, people, rooms, equipment)
- a financial forecast, taking into account resource requirements:
  - using mathematical processes (for example, calculations, diagrams, data representations) to support forecasting
- ethical considerations (for example, codes of practice, intellectual property rights)
- a completed risk assessment, including details of how risks will be mitigated:
  - written in style and level of detail appropriate to the document's purpose
- how quality outcomes will be maintained (for example, through complying with relevant ISO standards)

(GEC1, GEC3, GMC8)

CS2 Researching

What you need to teach:

The student must be able to:

CS2.1 Conduct a review of independently selected scientific literature and other appropriate primary/secondary sources, including:

- introduction: the scope of the review and the criteria for the selection of sources - what was included in the review, what was not, and why
- main body, including:
  - evaluation of sources, including:
    - age/relevance of literature
    - reliability of sources (for example, peer review, conflicts of interest, citations, impact factor)
    - reliability of data (for example, sample sizes, what collection method was used)
    - logically ordered discussion of themes, including how the literature relates to each other and to the project
    - correct use of a recognised referencing system (for example, Harvard, Vancouver, AMA in-text citation)
- conclusion, including:
  - a summary of the key points, using appropriate technical terms
  - agreements and disagreements in the literature
  - any gaps or potential future areas of study
  - a full bibliography of sources

(GEC2, GEC4, GEC5)

CS3 Working with others

What you need to teach:

The student must be able to:

CS3.1 Identify their own role in relation to the wider team, including:

- team structure (for example, position within the team, any direct reports)
- team working, using digital collaboration tools to meet with, share and collaborate with colleagues
- wider organisational structure (for example, relationships between individual teams/departments)
- contact with external stakeholders/clients (for example, directly or through third-parties)
- establishing own accountability for tasks and deliverables
- establishing own and others' area of expertise

CS3.2 Meet their responsibilities when working in a wider team by ensuring that the project is compliant with relevant:

- health and safety requirements (for example, if storing and handling hazardous substances)
- environmental requirements (for example, when disposing of waste)
- data protection regulations (for example, when using information technology)
- SOPs specific to the lab in which they are working
- project timescales (for example, equipment and spaces are used in the allotted times)

(GDC3)

CS4 Creativity and innovation

What you need to teach:

The student must be able to:

CS4.1 Make creative, innovative improvements to scientific practice, processes and outcomes by following an evaluation cycle:

- plan:
  - identify a potential area for improvement, taking into account:
    - who will benefit from the improvement
    - the desired outcome
  - gather information to understand more about the need for the required improvement (for example, talk to more experienced colleagues, collect data, research literature)
  - generate ideas and screen them against the desired outcome (which approach will achieve the best results?)
- do:
  - use their knowledge of context to find appropriate and approximate solutions
  - implement the improvement
  - record the results, systematically organising and recording data prior to any scaling or processing that may be required
- check:
  - use data to analyse the results against the desired outcome, applying appropriate statistical techniques from the list below:
    - mean and median
    - standard deviation
    - range
    - Chi Square test
    - T-test
    - Spearman's rank
- act:
  - review the improvement and recommend next steps

(GMC2, GMC5)

CS5 Problem solving

What you need to teach:

The student must be able to:
CS5.1 Solve a problem within a science context, by:
• identifying and clearly defining the problem:
  o demonstrating a thorough understanding of the context of the problem
• deciding on change to be made, taking into account:
  o steps required to implement the change
  o success criteria for measuring the impact of the change
• implementing the changes, using new technologies as appropriate:
  o gathering data
  o recording results
• evaluating the impact and continuing to monitor any changes:
  o making recommendations for further improvement
(GMC10)

CS6 Communication

What you need to teach:
The student must be able to: **CS6.1 Provide results and recommendations (written and verbal) to customers/clients, by:** • communicating in a clear and unambiguous way, tailoring language and technical information to the audience • selecting the most appropriate way of presenting data, using images and other tools (for example, visualisations or infographics) to clarify complex information • actively listening to the client's contributions and asking questions to test understanding • responding to the client's questions, using a tone and register that reflects the audience • speaking clearly and confidently, using appropriate tone and register • answering the brief/research questions, providing supporting documentation in different formats • highlighting the commercial/business benefits for the customer/client, using calculations, diagrams and data to support these assertions

What you need to teach:
(GEC1, GEC2, GEC3, GEC6, GMC8, GDC2)

CS7 Reflective evaluation

What you need to teach:

The student must be able to:
CS7.1 Evaluate the project's processes and outcomes, focusing on:
• experimental design:
  ○ was the project designed to yield the maximum results from the minimum repeated experiments?
• the accuracy and reliability of the results, using appropriate technical terms:
  ○ was the sample size sufficient for reliability?
  ○ was the equipment appropriate to ensure accuracy?
• reproducibility:
  ○ can the results easily be replicated?
• suitability of equipment:
  ○ was the chosen equipment appropriate for the experiment?
• suitability of methods:
  ○ were the chosen methods the most suitable?
• own actions during the project:
  ○ what did I do well and how can I improve?
• quality of the data, including how the data have been processed and scaled:
  ○ were there sufficient data (from different methodologies if necessary) to draw valid conclusions?
• fulfilment of objectives:
  ○ were the project's objectives met?
• recommendations for improvement:
  ○ how could the experiment be more effective?
(GEC4, GMC6)

Occupational specialism - technical: laboratory sciences

Knowledge and skills are set out side-by-side within their themed sections. The numbering is sequential throughout the performance outcome, from the first knowledge statement, following on through the skills statements. The ‘K’ and ‘S’ indicate whether the statement belongs to knowledge or skills.

Mandatory content

Performance outcome 1: Perform a range of appropriate scientific techniques to collect experimental data in a laboratory setting, complying with regulations and requirements

Performance outcome 2: Plan, review, implement and suggest improvements to scientific tasks relevant to a laboratory setting

Performance outcome 3: Identify and resolve issues with scientific equipment or data errors

Glossary

Technique

Overarching term for the many ways of obtaining information and results in a systematic way in science, examples would include preparation techniques, separating techniques.

Method

A scientific plan that specifies the procedures or processes that will be followed, this would include specifying the scientific techniques that will be used.

Task

A specific activity which needs to be accomplished as part of following a scientific method and undertaking a scientific technique.

Practical activities

Students taking this occupational specialism must have practical experience of the following laboratory activities:

- paper and thin layer chromatography (TLC)
- distillation
- acid-base and redox titration
- refluxing
- filtration
- differential staining (microorganisms)
- aseptic culture of microorganisms
- preparation of serial dilution
- prepare a solution of defined molar concentration

- colorimetry
- pressure using a U-tube manometer
- temperature using a probe and data logger
- radioactive count rate using Geiger counter
- conductivity meter to measure conductivity of a solution
- electrical polarity using ammeter and voltmeter
- calibrating a pH Meter, balance and a mechanical (variable volume) pipette

Performance outcome 1: Perform a range of appropriate scientific techniques to collect experimental data in a laboratory setting, complying with regulations and requirements

Safety, health and environmental practices in laboratory science	
Knowledge - What you need to teach	**Skills - What you need to teach**
The student must understand: **K1.1 How health, safety and environmental practices are applied when performing scientific techniques:** • planning to perform a scientific technique: o completing an appropriate risk assessment for typical hazards in a laboratory setting (for example, biological and chemical hazards) o selecting equipment and personal protective equipment (PPE) suitable to the task (for example, suitable eye protection and gloves) o selecting an appropriate space for the procedure (for example, one that includes a fume cupboard, cell hood) • safely performing a scientific technique: o using the correct PPE at all appropriate times o using resources and equipment appropriately for the scientific technique being performed (for example, keeping yourself and others safe)	The student must be able to: **S1.68 Work safely in a laboratory when performing specific scientific techniques by:** • following SOPs • following safe laboratory practice • maintaining excellent housekeeping • selecting an appropriate space • using equipment appropriately • using resources safely and efficiently (for example, only using the required amount for hazardous materials) **S1.69 Comply with relevant health and safety legislation and regulations, including COSHH and biosafety containment levels, when handling and disposing of solids, liquids and gases relevant for the scientific technique being performed, including:** • toxic (for example, methanol, chlorine, potassium dichromate (VI)) • corrosive (for example, acid) • irritants (for example, copper sulfate solution)

Safety, health and environmental practices in laboratory science	
○ following standard operating procedures (SOPs) and safe laboratory practice when performing the scientific technique ○ safely handling materials, in line with Control of Substances Hazardous to Health Regulations 2002 (COSHH): ▪ toxic (for example, methanol, chlorine, potassium dichromate VI) ▪ corrosive (for example, acid) ▪ irritants (for example, copper sulfate solution) ▪ sensitisers (for example, chromium compounds, sulfur dioxide) ▪ flammable (for example, ethanol, hydrogen) ▪ air/water sensitive materials (for example, alkali metals) ▪ compressed gases (for example, oxygen) ▪ pyrophoric (for example, magnesium) ▪ oxidising agents (for example, hydrogen peroxide) ▪ radioactive materials (for example, radioactive iodine) ▪ biohazards (for example, micro-organism cultures) ▪ serious health hazards (for example, formaldehyde) ▪ liquid nitrogen ▪ carcinogens (for example, ninhydrin) • completing a scientific technique: ○ safely disposing of materials, in line with COSHH: ▪ organic waste (for example, propanone)	• sensitisers (for example, chromium compounds, sulfur dioxide) • flammable (for example, ethanol, hydrogen) • air/water sensitive materials (for example, alkali metals) • compressed gases (for example, oxygen) • pyrophoric (for example, magnesium) • oxidising agents (for example, hydrogen peroxide) • radioactive sources (for example, caesium-137) • biohazards (for example, micro-organism cultures) • organic waste (for example, propanone) **S1.70 Complete a risk assessment to minimise potential hazards and risks when performing a scientific technique:** • step 1 - identifying the hazards, taking account of warning symbols and using model risk assessments: ○ chemical (for example, compressed gases, cleaning agents) ○ biological (for example, biological samples) ○ physical (for example, repetitive tasks, noise levels) • step 2 - assessing the risks: ○ how likely is the scientific technique to go wrong? ○ who might be harmed? ○ what could be the consequences? • step 3 - evaluating the risks and selecting control measures:

Safety, health and environmental practices in laboratory science	
▪ toxic (for example, methanol, chlorine, potassium dichromate (VI)) ▪ corrosive (for example, acid) ▪ flammable (for example, ethanol, hydrogen) ▪ compressed gases (for example, oxygen) ▪ pyrophoric (for example, magnesium, alkali metals) ▪ oxidising agents (for example, hydrogen peroxide) ▪ radioactive sources (for example, caesium -137) ▪ biohazards (for example, micro-organism cultures) ▪ serious health hazards (for example, formaldehyde) ▪ carcinogens (for example, ninhydrin) ○ reporting any near misses, accidents or injuries, following the appropriate processes ○ maintaining excellent housekeeping (for example, washing/autoclaving glassware effectively and storing equipment and chemicals appropriately) **K1.2 How to use resources efficiently when performing scientific techniques:** • energy (for example, heating to a required temperature and not above) • water (for example, recycling of water) • waste (for example, using re-usable equipment)	○ identifying alternate or safer methods than those proposed (for example, using a different concentration of chemicals) ○ identifying the appropriate PPE to use • step 4 - recording findings, following the risk assessment and amending the control measures as necessary: ○ in a clear and unambiguous way ○ using technical language correctly ○ organising the findings logically and coherently ○ using the appropriate vocabulary, spelling and grammar • step 5 - reviewing risk assessment and modifying method where required (GEC1) **S1.71 Use appropriate PPE when performing scientific tasks (for example, suitable eye protection and gloves).**

Ethics	
Knowledge - What you need to teach	**Skills - What you need to teach**
The student must understand: **K1.3 The principles of the 'Universal Ethical Code for Scientists 2007' and how it affects ethical practices in a laboratory setting:** • rigour: o acting with skill and care in all scientific work o maintaining up-to-date skills and assisting with their development in others o taking steps to prevent corrupt practices and professional misconduct o declaring conflicts of interest o being alert to the ways in which research derives from and affects the work of other people, and respecting the rights and reputations of others • respect: o ensuring that your work is lawful and justified o minimising and justifying any adverse effect your work may have on people, animals and the natural environment • responsibility: o seeking to discuss the issues that science raises for society o listening to the aspirations and concerns of others o not knowingly misleading, or allowing others to be misled, about scientific matters	The student must be able to: **S1.72 Adhere to ethical practice and codes of conduct to ensure confidentiality and meet intellectual property requirements:** • physical security (for example, locked doors, opaque glass, individual workstations) • electronic security (for example, controlled access systems, video surveillance) • operational security (for example, sign-in sheets, restricted access, following non-disclosure policies) • information security (for example, passwords, back-up systems, recording results securely by using a permanent bound lab book and having each page countersigned)

Ethics	
○ presenting and reviewing scientific evidence, theory or interpretation honestly and accurately **K1.4 Ethical issues and wider implications of scientific practices:** • misusing or misinterpreting published research • conducting unethical research (for example, with human tissue samples) **K1.5 The importance of adhering to codes of conduct to ensure confidentiality:** • to avoid improper disclosure of information and data that could harm the science organisation or individuals within it • to avoid accidental loss or release of sensitive information or data • to comply with regulatory requirements and guidance **K1.6 The importance of adhering to codes of conduct to protect intellectual property:** • to avoid sharing commercially sensitive information and research through improper disclosure • to avoid accidental loss or release of sensitive information and research • to respect the intellectual property of other scientists' work	

Core scientific knowledge	
Knowledge - What you need to teach	**Skills - What you need to teach**
The student must understand: **Atomic structure:** **K1.7 The definitions of orbital and nucleus:** • orbital - a region of space with the greatest chance of finding an electron • nucleus - a dense group of protons and neutrons in the centre of an atom **K1.8 How electrons are arranged in s and p sub-orbitals from periods 1 to 4:** • filling electron sub-shells in order of increasing energy from $1s^2$ to $4p^6$ **K1.9 How the electron arrangement in s and p orbitals is linked to the way in which elements are situated in s and p blocks in the periodic table:** • s-block elements have their outer electrons in s shells • p-block elements have their outer electrons in p shells • d-block elements have their outer electrons in d shells **K1.10 How the position of the element in the periodic table (arrangement of electrons) is related to the reactivity of that element:** • metal reactivity generally decreases as you go from left to right in the periodic table • non-metal reactivity generally increases as you go from left to right in the periodic table (apart from group 0 which are unreactive) **Amount of substance:** **K1.11 The definitions of relative atomic mass and relative molecular mass:**	The student must be able to: **S1.73 Apply scientific knowledge when undertaking scientific techniques by:** • choosing and justifying appropriate scientific techniques: ○ paper and thin layer chromatography: molecular structure and bonding (for example, choice of a polar or non-polar solvent) ○ distillation: molecular structure/bonding and kinetic changes (for example, differences in the boiling points of components due to differences in bonding) ○ refluxing: molecular structure/bonding and kinetic changes (for example, choice of refluxing due to organic components) ○ acid base and redox titration: oxidation and reduction (for example, identification of reaction from given equation) ○ differential staining techniques: characteristics of microorganisms (for example cell wall components by gram staining) ○ aseptic culturing: nature of infection and pathogens (causative agents)/transmission routes (for example, dilution, streaking and spread plates to culture micro-organisms) ○ preparation of serial dilutions: amount of substance (for example, use of calculations to determine dilutions needed) ○ filtration: molecular structure/bonding (for example, choice of filtering as some substances like metals are insoluble)

Core scientific knowledge	
• relative atomic mass is the average mass of the atoms of an element compared to carbon-12 • relative molecular mass is the sum of the relative atomic mass of the atoms in the molecule **K1.12 How to use balanced equations to apply the mole and Avogadro's constant to calculate mass and molar concentration (in g/dm^3 or mol/dm^3) in order to make a solution of defined molar concentration (n = cV).** **K1.13 How to perform calculations for acid-base titrations, based on mean titres, using n = cV and mass = n/Mr.** **K1.14 The relationship between volume of a gas and the number of moles:** • 1 mole of gas occupies a volume of 22.4dm^3 at standard temperature and pressure **Molecular structure and bonding:** **K1.15 The different types of bonds including ionic, metallic and covalent and how they are formed in relation to electrons:** • ionic bonding involves the electrostatic attraction between positive and negative ions formed by the transfer of one or more electrons from a metal to non-metal • covalent bonding involves sharing of electron pairs • metallic bonding forms a sea of delocalised electrons throughout the structure **K1.16 The structure of substances in relation to ionic, metallic and covalent bonding:** • ionic lattice as a large 3D structure containing oppositely charged ions • covalent structures as simple molecules or giant covalent structures of many atoms	• planning the steps of the technique in the correct order, ensuring correct quantities and concentrations are used

Core scientific knowledge	
• metallic structures as an arrangement of closely packed metal ions with a sea of delocalised electrons **K1.17 The relationship between the electron pair repulsion theory and the shapes of the following molecules:** • linear: 2 electron pairs repel to be 180^{o} apart • tetrahedral: 4 electron pairs repel to be 109.5^{o} apart • trigonal planar: 3 electron pairs repel to be 120^{o} apart **K1.18 The effect of structure and bonding on a range of properties including:** • solubility and dissolution: ○ ionic substances tend to be soluble in polar solvents like water ○ metallic substances tend to be insoluble ○ simple covalent substances can be soluble, polar molecules tend to be soluble in polar solvents and non-polar tend to be soluble in non-polar solvents • electrical conductivity: ○ ionic substances conduct electricity only if molten or dissolved ○ metallic substances conduct electricity even as solids ○ simple covalent substances do not conduct electricity • melting/boiling point: ○ ionic substances have high melting and boiling points ○ metallic substances have high melting and boiling points ○ simple covalent substances have low melting and boiling points	

Core scientific knowledge	
Organic chemistry: **K1.19 How to apply the International Union of Pure and Applied Chemistry (IUPAC) rules to name the following organic compounds:** • straight chain alkanes and cycloalkanes: o methane, ethane, propane, butane, cyclopropane and cyclobutane • straight chain alkenes: o ethene, propene, butene and pentene • alcohols: o methanol, ethanol, propan-1-ol, propan-2-ol and butan-1-ol, butan-2-ol • carboxylic acids: o methanoic acid, ethanoic acid, propanoic acid and butanoic acid • aldehydes and ketones: o ethanal, propanal, propanone and butanone • amines: o ethylamine and propylamine **K1.20 The word and symbol equations to show reactions of the following organic compounds:** • alkenes (ethene, propene, butene and pentene): o reactions with bromine, hydrogen bromide and hydrogen • alcohols (methanol, ethanol, propanol and butanol): o combustion o oxidation to a ketone or carboxylic acid with the use of [O] as the oxidising agent **K1.21 The possible uses of the following techniques used during organic synthesis:**	

Core scientific knowledge	
• refluxing - used for long reactions with volatile components • recrystallisation - used for purifying a substance • separating funnel - used for separating and purifying a substance **Oxidation and reduction:** **K1.22 The oxidation and reduction process:** • oxidation: o gaining oxygen: ▪ oxidising agents providing oxygen o losing hydrogen: ▪ oxidising agents removing hydrogen o losing electrons: ▪ oxidising agents removing electrons • reduction: o losing oxygen: ▪ reducing agents removing oxygen o gaining hydrogen: ▪ reducing agents providing hydrogen o gaining electrons: ▪ reducing agents providing electrons • redox: o where reduction and oxidation happen in the same reaction **K1.23 How to use standard electrode potentials to determine the direction of electron flow in electrochemical cells:** • electrode that is relatively more negative (oxidation half-cell) will release electrons more readily and electrons will flow from this electrode **Enthalpy and Entropy:**	

Core scientific knowledge	
K1.24 The definition of enthalpy and entropy: • enthalpy change is the amount of energy taken in or given out in a reaction at constant pressure • entropy is a measure of disorder in how energy is dispersed in a system **K1.25 How to calculate free energy change to link enthalpy and entropy:** • using the Gibbs equation ($\Delta G = \Delta H - T \Delta S$ system) **K1.26 Factors that affect the stability of compounds and the chance of chemical reactions occurring:** • the stability of compounds: o depends on their internal energy o the lower the internal energy the more stable a compound is • the chance of chemical reactions occurring: o depends on the free energy change (ΔG) o a negative value for free energy means the reaction is likely to be feasible at that temperature **K1.27 How to perform calculations of enthalpy changes:** • from an existing Hess cycle: o calculate the sum of the enthalpy changes for each reaction on the indirect route for the chosen reaction (reversing the sign for reactions that are reversed). Students are not expected to know definitions of enthalpy changes, such as enthalpy change of formation and enthalpy change of combustion • bond enthalpy values:	

Core scientific knowledge	
○ add up the bond enthalpies for the reactants (gives a positive value, as bond breaking is endothermic) ○ add up the bond enthalpies for products (gives a negative value, as bond making is exothermic) ○ add the enthalpies for bond breaking to bond making (keeping their original signs) **Materials science:** **K1.28 How the properties of the following materials are related to their applications:** • synthetic polymers: ○ properties: electrical insulator, lightweight, chemically unreactive ○ applications: examples could include - personal protective equipment (PPE) is chemically unreactive yet lightweight, non-stick coating and containers are chemically unreactive • alloys: ○ properties: strong, lightweight, resistant to corrosion ○ applications: examples could include - machine parts are strong but lightweight, lab benching and fume cupboards are strong but resistant to corrosion • composites: ○ properties: strong, lightweight ○ applications: examples could include - structures are strong, electronic screens are lightweight yet still strong **K1.29 The definitions and the characteristics of:** • addition polymerisation: ○ definition: a polymer made of monomers without generation of other products	

Core scientific knowledge	
○ characteristics: high atom economy • condensation polymerisation: ○ definition: polymer made by chemical reaction producing a small molecule as a by product ○ characteristics: lower atom economy **Metabolic pathways and bioenergetics:** **K1.30 The differences between anabolic and catabolic pathways in terms of energy change:** • anabolic pathways: pathways which require energy to synthesise larger molecules (for example, synthesis of proteins from amino acids) • catabolic pathways: pathways that release energy by breaking down complex molecules to simpler compounds (for example, glycolysis, Krebs cycle) **K1.31 The main activities and outputs of the 4 pathways of aerobic respiration involving glucose and how each of these stages is linked:** • glycolysis: ○ initial stage of aerobic respiration involving glucose ○ takes place in the cytoplasm ○ involves 10 reactions ○ reactions at each step are catalysed by different enzymes ○ via the hydrolysis of 2 ATP molecules, coverts a glucose molecule into two pyruvate molecules and transfers two hydrogen ions to nicotinamide adenine dinucleotide (NAD) forming reduced NAD	

Core scientific knowledge	
○ energy released is sufficient for the regeneration of 2 molecules of adenosine triphosphate (ATP) • link reaction Acetyl-Coenzyme A oxidation (acetyl-CoA): ○ short pathway in comparison with other pathways ○ pyruvate (from the glycolysis pathway) diffuses from the cytoplasm to the mitochondrial matrix through active transport ○ pyruvate is converted to acetyl-CoA • Krebs cycle: ○ Acetyl-CoA (from the link reaction) enters the Krebs cycle ○ the cycle involves a series of oxidation-reduction reactions that take place in the mitochondrial matrix ○ the Krebs cycle is a closed loop; the last part of the pathway reforms the molecule used in the first step ○ the cycle includes 8 major steps ○ the Krebs cycle produces 2 molecules of carbon dioxide, 3 molecules of reduced NAD, 1 reduced flavin adenine dinucleotide (FAD) and 1 molecule of ATP ○ NAD and FAD are high energy coenzyme molecules that act as hydrogen acceptors ○ the Krebs cycle goes around twice for each molecule of glucose that enters cellular respiration (1 cycle for each of the two acetyl-CoA molecules produced from the two pyruvate molecules) • electron transport chain (ETC) and oxidative phosphorylation:	

Core scientific knowledge	
○ the electron transport chain is a series of carriers and pumps found in the inner mitochondrial membranes ○ the hydrogen acceptors, reduced NAD and FAD from the Krebs cycle and links reaction transfer their hydrogen atoms to NADH dehydrogenase within the first complex on the ETC, which split them into electrons and hydrogen ions ○ in the process, the coenzymes can be reused in other steps of cellular respiration ○ as electrons are passed down the redox carriers in the inner membrane, they flow from a higher to lower energy level, releasing enough energy to pump in hydrogen ions into the intermembrane space – the hydrogen ions flow through chemiosmosis through ATP synthase, providing the energy for the formation of ATP **K1.32 The main activities and outputs of beta-oxidation and the role of beta-oxidation in aerobic respiration when an alternative initial substrate is used:** • beta-oxidation: ○ lipid is used as a respiratory substrate when carbohydrate levels are low; in aerobic respiration, beta-oxidation becomes the first pathway, rather than glycolysis ○ lipid is first split into its constituent molecules of glycerol and fatty acids ○ the pathway then involves the breakdown of the fatty acids into acetyl-CoA which can enter the Krebs cycle ○ the 4 reactions involved in this pathway are repeated until the entire fatty acid	

Core scientific knowledge	
chain has been converted into individual acetyl-CoA molecules **K1.33 How metabolic pathways are regulated by enzymes and feedback mechanisms:** • enzymes both catalyse reactions in metabolic pathways and are key to the regulation of the reactions in the metabolic pathways • enzymes are inhibited by certain substances known as inhibitors • if the substance which inhibits an enzyme is a substrate or intermediate product in a pathway reaction, this sets up a feedback system to regulate the pathway • examples: ○ phosphofructo kinase (PFK) is an important enzyme in glycolysis, it is inhibited by several substrates, including ATP ○ citrate synthase is responsible for the rate of reaction in the first step of the Krebs cycle; it is inhibited by high concentrations of ATP, Acetyl-CoA and reduced NAD **Genotyping and Phenotyping:** **K1.34 The differences between genotyping and phenotyping:** • genotyping determines the sequence of nucleotide bases, which can be used to determine the presence of specific genes, regulating sequences and abnormalities that could result in a disease/disorder • genotyping is used to determine the difference or similarities between samples of DNA • phenotyping is the process of predicting physical appearance based on genotyping	

Core scientific knowledge	
• phenotyping is used within forensics to indicate characteristics such as ethnicity, sex, eye colour and hair colour. It will only ever be a prediction and not a completely accurate representation **K1.35 How to determine genotype through investigating deoxyribonucleic acid (DNA) sequencing, using genotyping techniques such as polymerase chain reaction (PCR):** • PCR is the replication of DNA in a test tube • a sample of target DNA is heated to its melting point to break the bonds between DNA strands and separate these into single strands • the solution is cooled and the enzyme DNA polymerase, nucleotides and primers are added; the process of DNA amplification is initiated • further heating takes place and the DNA polymerase catalyses the synthesis of complementary strand for each of the single DNA strands • the process is repeated until sufficient DNA is produced to determine genotype **Ecosystems:** **K1.36 The term ecosystem:** • biological community (plants, animals and micro-organisms) and the abiotic factors (light, temperature, water, atmosphere, wind and chemical elements) with which they react • an ecosystem is made up of both living and non-living components **K1.37 How the following contribute to an ecosystem:** • habitats: the physical site where an organism or group of organisms live	

Core scientific knowledge	
• populations: group of organisms of the same species • community: all the organisms or populations in an ecosystem • niche: role and position a species has within an ecosystem **K1.38 The following processes within ecosystems:** • biomass transfer: o transfer of biomass (energy) from producers and consumers through a food chain o transfer is from one trophic level to the next o in healthy ecosystems about 10 percent of biomass is transferred from one trophic level to the next • recycling: o nutrients, such as through the carbon and nitrogen cycle, as well as minerals and water are recycled within ecosystems o decomposing bacteria and fungi break down dead organisms which recycles minerals and nutrients • primary succession from pioneer species to a climax community: o the colonisation of an environment which has previously been devoid of other organisms o colonisation of an area for the first time • bioaccumulation: o gradual accumulation of contaminants within an ecosystem	

Core scientific knowledge	
○ toxins, chemicals and pesticides can all accumulate within ecosystems and negatively affect organisms **K1.39 How to measure the distribution and abundance of organisms in an ecosystem:** • using sampling techniques: ○ quadrat ○ belted transect ○ mark release capture • calculating percentage cover or population density from these techniques **Nanoscience and nanotechnology:** **K1.40 The considerations that need to be made when manipulating matter whose basic components are of a nanoscale size:** • the scale of the particles • exposure limits • using specialised equipment (for example, atomic force microscope) • appropriately trained personnel **Electronics:** **K1.41 The difference between analogue and digital signals:** • analogue signals are continuous • digital signals are discrete **K1.42 How analogue signals are converted to digital signals so that computers can further interpret them:** • the analogue signal is first converted into binary code and then into a digital signal **K1.43 The advantage of using a digital signal over an analogue signal:** • to improve accuracy by reducing the effect of noise and interference	

Core scientific knowledge	
K1.44 The advantages of using analogue sensors to detect physical inputs and convert them to digital readouts, (for example, in a pH probe or temperature probe): • analogue sensors are more precise, with higher resolution • analogue sensors measure continuously **Nuclear physics:** **K1.45 The properties of stable and unstable nuclei:** • stable: a balance between the number of protons and neutrons in the nucleus • unstable: an imbalance between the number of protons and neutrons in the nucleus **K1.46 The link between mass and energy (mass-energy equivalence) in nuclear fission, using $E = MC^2$.**	

Scientific tasks	
Knowledge - What you need to teach	**Skills - What you need to teach**
The student must understand: **K1.47 When scientific and mathematical skills are applied when performing a range of scientific techniques:** • measuring: ○ volume using a burette ○ mass on a 3-Decimal Place (DP) balance (analytical or top pan balance) • manual dexterity: ○ when using a pipette	The student must be able to: **S1.74 Follow multistep scientific methods (for example, make a defined molar concentration and perform a titration) based on relevant SOPs when performing a range of practical scientific techniques.** **S1.75 Apply a range of science and mathematical skills when performing practical scientific techniques:** • measuring: ○ with accuracy and precision

Scientific tasks	
○ performing aseptic technique ○ setting up a microscope • observing: ○ colour changes at titration end point ○ microscopic observations • quantifying: ○ cell counts ○ abundance of organisms in an ecosystem • predicting: ○ melting and boiling points ○ possible components of a mixture in chromatography • analysing: ○ trend charts ○ calculations ○ statistical analysis • evaluating: ○ evaluating the success of the scientific method **K1.48 The factors to consider when choosing between a range of scientific techniques:** • health, safety and ethical considerations • equipment availability and cost • substance/sample to be investigated • strengths and limitations of the technique • objective of the investigation **K1.49 The purpose of:** • analysing substances and chemical environments: ○ to confirm composition and/or quantity of materials	○ avoiding any cumulative errors • manual dexterity: ○ using equipment competently and safely ○ manipulating and manoeuvring equipment and samples effectively • observing: ○ accurately reading displays and scales ○ distinguishing fine changes in appearance • quantifying: ○ accurately counting and measuring ○ using appropriate units and scaling ○ using appropriate equipment where applicable • predicting: ○ using evidence and verifiable scientific information • analysing: ○ using mathematical processes to support technical arguments • evaluating: ○ making summary judgements based on adequate and appropriate data (GMC1, GMC8) **S1.76 Use the following practical scientific techniques to measure a range of physical properties:** • pressure using a U-tube manometer: ○ setting up the manometer vertically ○ opening one tube to the atmosphere or attaching to gas supply ○ measuring the height difference in the u-tube

Scientific tasks	

• micro and nano science:
  ○ to analyse matter on an atomic, molecular and supramolecular scale
K1.50 Why the following techniques are used:
• titration (for example, purity analysis):
  ○ purity analysis and determining concentration
• preparation of serial dilutions:
  ○ to alter concentrations to enable analysis
K1.51 When it is appropriate to use the following techniques to identify/determine, separate or analyse substances and environments:
• calorimetry to analyse energy changes in chemical reactions
• characterisation using mass spectrometry to identify compounds and infra-red spectroscopy to identify functional groups
• colorimetry to determine concentration
• chromatography to separate and therefore identify the components of a mixture
• distillation to separate the components of a mixture
• filtration (for example, vacuum and fluted) to separate insoluble components of a mixture
• electrolysis to separate compounds (for example, chlorine gas from chlorine compounds)
K1.52 When it is appropriate to use the following laboratory techniques:
• tissue culture to grow cells or tissues on a culture medium
• cloning to generate genetically identical copies of a cell
• protein purification to isolate specific proteins for further analysis
	• temperature using a probe and data logger:
	  ○ attaching the probe to data logger
	  ○ inserting the probe into substance to be tested
	  ○ taking the reading from data logger
	• radioactive count rate using Geiger counter:
	  ○ measuring the background count rate
	  ○ measuring the count rate for a defined period of time, using shielding if appropriate
	• conductivity meter to measure conductivity of a solution:
	  ○ calibrating the equipment with a solution of known conductivity
	  ○ rinsing the probe with deionised water and then inserting into test solution
	  ○ rinsing further between subsequent readings including repeats
	• electrical polarity using an ammeter and a voltmeter:
	  ○ setting up the circuit with ammeter in series or voltmeter in parallel
	  ○ noting down the sign and reading from the meter, then reversing the wires on the meter to check that the sign is opposite
	S1.77 Use the following practical scientific techniques to analyse substances:
	• acid base and redox titration:
	  ○ measuring quantity of unknown solution using a pipette
	  ○ determining the end point by colour change
	  ○ using n = cV to work out concentration
	• preparation of serial dilutions:

Scientific tasks	

• extraction and sequencing of DNA to identify genes
• microbiology techniques:
  ○ aseptic culturing to analyse biological environments to confirm the presence of microorganisms
  ○ differential staining to identify microorganisms (for example, Gram staining to identify Gram negative or Gram positive)
  ○ cell counting methods to count/quantify number of cells present in a sample, including manual counting methods such as using a haemocytometer or colony-forming unit (CFU), or automated cell counting, such as coulter counters or flow cytometry
 	
K1.53 The purpose of the following environmental laboratory techniques:
• biochemical oxygen demand (BOD) to determine the amount of dissolved oxygen needed by microorganisms in a water sample
• chemical oxygen demand (COD) to determine the amount of oxygen needed for complete chemical oxidation in a water sample
• total organic carbon (TOC) to determine the total amount of organic carbon in a sample
• total suspended solids (TSS) to determine the dry weight of suspended solids from a water sample
• measuring toxicity to determine median lethal dose (LD_{50}) and lethal concentration (LC_{50})
 	
K1.54 The purpose of laboratory techniques used in the science manufacturing environment:
• sampling:
	○ determining the required dilution
	○ working with proportion by applying the numerical form of proportion to reach target concentration
	○ measuring accurately and transferring the solution to the subsequent diluent
	• colorimetry:
	○ selecting the appropriate filter
	○ zeroing the colorimeter using a cuvette containing the solvent only
	○ measuring the absorbance of a cuvette with test solution
	
	(GMC3)
	
	S1.78 Use the following practical scientific techniques to analyse environments and identify microorganisms within biological environments:
	• aseptic culturing:
	○ manipulating the equipment to limit contamination (for example, when transferring the microorganism culture to growth medium)
	○ sterilising equipment throughout the technique (for example, flaming of the wire loop)
	○ following disinfection procedures upon completion of the technique
	• differential staining techniques:
	○ preparing the slide and introducing the smear, using aseptic technique
	○ fixing the smear (for example, heat fix)
	○ applying stains and rinses in the correct order
	○ examining the smear using a light microscope and identifying if bacteria are

Scientific tasks	
○ part of the process for quality assurance of intermediates where a representative sample is taken in order to determine any impurities within the product • testing: ○ to identify the presence of microbiological organisms (for example, in pharmaceutical products) ○ to determine the stability of products and chemicals ○ to determine the level of an active ingredient (for example, in a pharmaceutical product) ○ to determine the levels and identity of impurities in process starting materials • scaling up to pilot plant: ○ to determine how increases in scale may affect the manufacturing process (for example, flow rates, reaction times) **K1.55 How physics laboratory techniques are applied in different fields:** • electronics to determine input and output voltages of logic circuits • mechanics to determine stress (force/area) on an object under tension • ionising radiation to determine half-value layer (HVL) of a substance • thermal to determine thermal conductivity • electricity to determine the voltage across and current through a component) • magnetism to measure the magnetic flux density **K1.56 The purpose of the following techniques, particularly those related to genomics:** • nuclear magnetic resonance spectroscopy (NMR) (Carbon-13 and proton NMR), used	Gram-positive (violet in colour) or Gram-negative (pink in colour) **S1.79 Use the following practical scientific techniques to prepare, isolate and separate materials:** • paper and thin layer chromatography: ○ applying sample onto chromatogram ○ adding solvent to appropriate level (for example, below baseline) ○ using a location agent, if appropriate (for example, iodine, UV light and ninhydrin) ○ measuring substance from baseline • distillation: ○ correctly setting up the equipment (for example, attaching condenser correctly) ○ using appropriate heating method for sample (for example, heating mantle) ○ reading off boiling point using correctly placed thermometer • filtration (for example, vacuum and fluted): ○ correctly setting up the equipment (for example, attach aspirator correctly) ○ choosing and preparing the appropriate size filter paper (for example, fluting if necessary) ○ adding suspension at appropriate rate • refluxing: ○ correctly setting up the equipment (for example, attaching condenser correctly) ○ using appropriate heating method for sample (for example, heating mantle) ○ adjusting heat and condenser for appropriate drip rate **S1.80 Prepare a solution of defined molar concentration, by:**

Scientific tasks	
to identify the presence of certain atoms and environments in a sample using electromagnetic radiation • polymerase chain reaction (PCR), used to sequence multiple copies of specific sequences of new DNA strands, complementary to a presented template strand • gel electrophoresis, used to separate DNA fragments according to their size, also used to separate other macromolecules dependent on size and charge • flow cytometry, used in genomics to determine genome size, to give an estimate of amount of nuclear content • next generation sequencing range of techniques that allow for sequencing of DNA quickly and cost effectively. These techniques enable the sequencing of thousands to millions of DNA molecules simultaneously	• calculating the relative molecular mass for the concentration needed (n = cV) • using a balance and volumetric flask correctly • ensuring the transfer of all solid and liquid without spilling • rinsing equipment into volumetric flask **S1.81 Use appropriate international system of units (SI) and be able to work with a range of appropriate scales when conducting scientific tasks:** • length - metre (m) • time - second (s) • amount of substance - mole (mol) • electric current - ampere (A) • temperature - kelvin (K) • mass - kilogram (kg) **S1.82 Convert between SI and non-SI measurement units when conducting scientific tasks:** • mass (for example, ounces to kilograms) • temperature (for example, fahrenheit to kelvin) **S1.83 Follow a method from a scientific paper when performing a technique:** • selecting key information from a method or scientific paper and summarise for use to perform the scientific technique • selecting relevant facts from the scientific paper

Scientific equipment, instrumentation and use of raw materials and reagents	
Knowledge - What you need to teach	**Skills - What you need to teach**
The student must understand: **K1.57 A range of laboratory equipment used to identify and separate samples:** • chromatography columns (for example, in column chromatography and gas liquid chromatography (GLC)) • mass spectrometer • infra-red spectrometer • nuclear magnetic resonance spectrometer **K1.58 The purpose of electrical calorimeters:** • to measure energy change with minimal heat loss **K1.59 A range of laboratory equipment that is used to analyse biochemical oxygen demand (BOD), chemical oxygen demand (COD) and total organic carbon (TOC) content:** • dissolved oxygen probe (BOD) • reflux equipment and calorimeter (COD) • TOC analysers to measure CO_2 from organic carbon (TOC) **K1.60 The purpose of cryogenic equipment in a laboratory environment:** • to maintain the integrity of biological material **K1.61 The purpose of the following physics laboratory equipment:** • oscilloscopes: used to display time-varying signals in a graphical form • search coil: used to measure magnetic flux • capacitors: used as part of a circuit to store electrical charge	The student must be able to: **S1.84 Select appropriate equipment to complete practical scientific techniques:** • measuring cylinders • light microscope • burette • 3 Decimal Place (DP) balance (analytical or top pan) • volumetric, graduated and mechanical (variable volume) pipettes • meters - ammeters, voltmeters, multimeters • Geiger counter • heating apparatus • pH meters • TLC plates • microbiological equipment - (for example, incubator) • data loggers with temperature probe • fume cupboard • autoclave • condenser **S1.85 Demonstrate practical technical competence in the use of equipment:** • taking accurate measurements • correctly manipulating the equipment • using equipment safely and for intended purpose **S1.86 Calibrate scientific equipment and check it is fit for use:** • pH meters:

Scientific equipment, instrumentation and use of raw materials and reagents	

• lasers: used to look at wave patterns
• light gates: used to measure speed/acceleration
• meters:
  ○ ammeters: used to measure current
  ○ voltmeters: used to measure potential difference
  ○ multimeters: used to measure voltage, current and resistance
  ○ Geiger counter: used to detect ionising radiation
• thermistors: used to change resistance with changing temperature in a circuit, used as temperature sensors
• light dependant resistors (LDR): used to change resistance with changing light intensity in a circuit, used as light sensors
• data logger with temperature probes: used to measure changing temperature
K1.62 The importance of using appropriate reagents and raw materials to complete practical scientific tasks, considering factors such as:
• sources and suppliers (for example, using reputable suppliers to ensure quality)
• handling and storage (for example, adhering to expiry date to ensure integrity)
• quality control and assurance of raw materials and reagents (for example, ensuring reagents meet the standards of those previously used, appropriate purity)
	○ using buffer solutions
	• balances:
	  ○ using calibration masses
	• mechanical (variable volume) pipette:
	  ○ using distilled water and balances

Scientific equipment, instrumentation and use of raw materials and reagents	
Data collection and recording	
Knowledge - What you need to teach	**Skills - What you need to teach**
The student must understand: **K1.63 The principles of producing reliable and verifiable results:** • recording in a clear and unambiguous way (for example, use of tables, indelible ink, not using sticky notes or loose papers, ensuring writing is legible) • using appropriate units, notation and correct number of significant figures • critically reviewing data obtained (for example, identifying any anomalous results) • repeating investigations and referencing why any action was taken, where appropriate **K1.64 The purpose of the following analysis methods to produce reliable and verifiable results when dealing with large sets of data in genomics:** • computation and statistical analysis: used to manage and appropriately analyse the large data sets that result from genome sequencing • algorithms: programmed codes which allow large data sets from genome sequencing to be analysed and compared effectively and efficiently	The student must be able to: **S1.87 Produce data from scientific techniques, which are reliable and verifiable, by:** • recording data and records in a clear and unambiguous way: ○ using appropriate units, notation and correct number of significant figures ○ organising ideas logically and coherently • selecting and using appropriate digital technology (for example, PC-connected data logger, multimeter): ○ to gather data evidence efficiently (for example, using a temperature data logger instead of multiple manual recordings) ○ demonstrating a secure level of competence and confidence in configuring and using digital devices • critically reviewing data obtained and repeating investigations where appropriate (GDC1, GDC4) **S1.88 Contribute to the preparation of the following sections of a scientific report including:** • abstract which concisely summarises the completed scientific techniques and the results obtained • introduction • methods • results, including using reliable and verifiable data

Scientific equipment, instrumentation and use of raw materials and reagents	
	• discussion/evaluation which includes using calculations, diagrams and data representations to support technical arguments • conclusion

Legislation, regulations, standards and guidelines	
Knowledge - What you need to teach	**Skills - What you need to teach**
The student must understand: **K1.65 How the following regulations are applied when performing scientific techniques in a laboratory environment:** • good laboratory practice (GLP): o requires all techniques that are performed are of high quality, following standard operating procedures. o requires that all techniques performed and results obtained demonstrate uniformity, consistency, reliability, traceability and reproducibility o requires accurate record-keeping o often results in automated approaches being implemented within a laboratory setting • good manufacturing practice (GMP): o requires that all products produced within a laboratory are of high quality o requires all batches of products to be of consistent quality o requires that all products are safe to use, uncontaminated and effective • quality management systems (QMS):	The student must be able to: **S1.89 Follow SOPs to ensure compliance with regulations and quality standards when performing scientific techniques.**

Legislation, regulations, standards and guidelines	
○ ensures processes and procedures within a laboratory setting are undertaken in specific ways to guarantee the highest level of accuracy and reliability ○ are applied across all steps of activity within a laboratory setting, including documentation requirements, use of equipment and chemicals, as well as requirements for staff training ○ ensures that decisions within a laboratory setting are data-driven • good clinical practice (GCP): ○ requires that all clinical research be performed to international ethical (including confidentiality), scientific and practical standards **K1.66 The role of the following standards and regulatory bodies (including industry-specific) within a laboratory environment:** • United Kingdom Accreditation Service (UKAS): ○ the sole national accreditation body recognised by the government to assess, against internationally agreed standards, any laboratories that provide certification, testing, inspection and calibration services. ○ accreditation by UKAS demonstrates the competence, impartiality and performance capability of laboratories • ASTM International: ○ International Standards Organisation (ISO) which develops and publishes technical standards to ensure the quality and safety of a wide range of products and services including plastics and adhesives	

Legislation, regulations, standards and guidelines	
○ laboratories involved in the production or testing of such products or providing specific scientific services are often required to demonstrate compliance with these standards • International Organisation for Standardisation (ISO): ○ independent, non-governmental international organisation which develops voluntary, consensus-based market relevant international standards to which organisations, including science laboratories, adhere ○ these standards cover a wide range of processes, procedures and practices; for example, in forensic science laboratory settings there is an ISO standard relating to recording, collecting, transport and storage of items • Pharmacopoeia (British standards): ○ provides quality standards for UK pharmaceutical substances and medicinal products • Medicines and Healthcare products Regulatory Agency (MHRA): ○ government agency which regulates and licenses medicines, medical devices and blood components for transfusion in the UK ○ regulates what products are safe and what products are not, to decide which products can enter the marketplace • Food and Drug Administration (FDA): ○ government agency in the United States responsible for regulating medicines, medical devices, food dietary supplements, cosmetics and blood products	

Legislation, regulations, standards and guidelines	
○ organisations intending to sell or supply any such products in the United States must prove to the FDA that these products are both safe and effective • European Medicines Agency (EMA): ○ independently evaluates market authorisation applications of medicines for sale or supply within the European Union ○ works closely with national regulatory agencies such as MHRA in the UK • Office for Nuclear Regulation (ONR): ○ independently regulates nuclear safety and security at licensed sites within the UK **K1.67 The purpose and importance of SOPs within a laboratory environment:** • maintaining health and safety by detailing all relevant health and safety requirements (for example, when using hazardous materials) • enabling consistency of approach across all technicians • meeting any legal or organisational requirements (for example, safe storage of controlled materials) • demonstrating compliance for audit purposes (for example, using standard documentation)	

Performance outcome 2: Plan, review, implement and suggest improvements to scientific tasks relevant to a laboratory setting

Planning laboratory techniques and use of equipment	
Knowledge - What you need to teach	**Skills - What you need to teach**
The student must understand: **K2.1 How the following considerations inform the planning of a laboratory task:** • customer/client requirements for laboratory analysis (for example, customer needs, what objectives need to be achieved) • laboratory sampling requirements (for example, what samples are required, frequency of sampling, quantity of sample) • laboratory health, safety, environmental and regulatory requirements (for example, identifying risks through a risk assessment) • resources required including laboratory equipment, reagents and consumables (for example, identifying the sources of equipment, reagents and consumables) • scheduling of laboratory testing (for example, planning timings and potential use of Gantt charts, taking into consideration shared resources) • scientific methods (for example, identifying the most appropriate methods to meet the objectives) • storage and transportation of samples (for example, correct temperature, correct storage container, temperature monitoring) • presentation of the data (for example, identifying most appropriate way of displaying the data, demonstrating whether objectives have been achieved or not including statistical significance) • the role of others within the laboratory environment:	The student must be able to: **S2.15 Design a scientific task to address a particular hypothesis, taking into consideration a range of factors:** • the customer/client requirements • laboratory sampling requirements • laboratory health, safety, environmental and regulatory requirements (for example, COSHH, REACH) • resources required, including laboratory equipment, reagents and consumables • appropriate scientific methods, equipment and techniques • appropriate controls • any specific storage requirements • the most appropriate way to present data **S2.16 Perform a literature review to extract relevant information to support the planning of a scientific task by:** • assessing the quality and reliability of the information accessed • extracting main ideas/key information (for example, methods), from appropriate sections of the paper, relevant to the purpose of the scientific task • selecting fact from opinion • recording relevant information accurately and concisely (GDC5, GEC4)

Planning laboratory techniques and use of equipment	
○ limits of job role and the laboratory itself ○ identifying who would need to be involved, roles and responsibilities of the laboratory team • developing a specific hypothesis, where appropriate, for a scientific task: ○ translating the client objectives into the hypothesis ○ identifying the most appropriate techniques for the scientific task ○ positive and negative controls: ▪ identifying the most appropriate controls to produce robust data ▪ identifying adequate control groups or sample groups, if appropriate **K2.2 How to undertake literature searches and use scientific papers to plan scientific tasks, by:** • accessing appropriate databases (for example, Pubmed, Merck Index* Online, National Institute for Health and Care Excellence (NICE), IOPscience) • using keywords and Boolean in searches • assessing the quality and reliability of the literature to the planned scientific task (for example, who the author is, size of the sample, peer-reviewed status, commercial implications, primary or secondary sources) **K2.3 The principles of laboratory method validation when planning scientific tasks:** • using accepted sample preparation methods • using certified standards to determine accuracy of the method • following accepted guidelines and/or requirements (for example, International Council for Harmonisation of Technical	**S2.17 Apply knowledge of scientific techniques to an unfamiliar context when planning a scientific task, taking into account:** • appropriate scientific techniques and methods • required scientific equipment, reagents and consumables • laboratory health, safety, environmental and regulatory requirements **S2.18 Keep sufficient stock levels of all required laboratory equipment, reagents and consumables for planned scientific tasks by:** • assessing stock levels through regular inventory management • ensuring all reagents are labelled and dated correctly • ordering stock as required

Planning laboratory techniques and use of equipment	
Requirements for Pharmaceuticals for Human Use (ICH) requirements) • following the manufacturers' guidelines for use, where appropriate **K2.4 The principles of laboratory equipment validation when planning scientific tasks:** • using certified standards to determine accuracy of the equipment • checking the equipment is running the up-to-date operating system • checking that the equipment is within calibration and service dates (fit for purpose) • following the manufacturers' guidelines for use, where appropriate **K2.5 The difference between concrete and abstract modelling techniques:** • concrete: a trial task prior to planning • abstract: planning on paper or using computer simulations	

Laboratory data processing and analysis	
Knowledge - What you need to teach	**Skills - What you need to teach**
The student must understand: **K2.6 How the following considerations inform data processing and subsequent analysis of the results in a laboratory environment:** • regulatory requirements (for example, validation, conformity to known analytical standards) • relevant calculations (for example, magnification and Rf values) • conversion of units (for example, consistent use of units across different data sets) • appropriate statistical techniques to determine the validity or significance of the results (for example, standard deviation, p value, uncertainty values) • customer requirements for the presentation of data (for example, graphs) • using complementary experimental methodologies from existing peer-reviewed studies to confirm results (for example, by the use of online databases) • using laboratory control charts and trend charts (for example, to confirm equipment and/or protocols are within tolerance) **K2.7 How to establish the validity of results against standards and controls:** • by using ongoing calculations to monitor results and identify anomalies • calculating Rf values and comparing to known values • using certified reference material (CRMs) **K2.8 The purpose of data processing and analysis in supporting improvements to laboratory techniques:**	The student must be able to: **S2.19 Complete relevant calculations on data obtained in the laboratory environment:** • relative molecular mass • concentration • magnification • Rf values • percentages • ratios • number of bacteria in a population using known division time • electrical resistance • pressure difference (from u-tube manometer) • percentage uncertainty **S2.20 Select appropriate statistical techniques to analyse and interpret results from scientific tasks:** • mean • standard deviation • Chi-square test • T-test (GDC4) **S2.21 Process results, using statistical software, for the following statistical techniques:** • standard deviation • Chi-square test • T-test **S2.22 Use the results of calculations and statistical analysis to interpret and evaluate data from scientific tasks to:**

Laboratory data processing and analysis	
• stability studies: to determine the most appropriate storage for preservation of reagents and consumables • laboratory trend charts: to determine that laboratory equipment is working within specification (for example, colony-forming unit (CFU) data) • laboratory method validation results: revalidating methods if results are outside of specification • proficiency testing (inter-laboratory comparison): to determine the accuracy and reliability of a laboratory's test results against results obtained by a certified laboratory	• determine trends • assess statistical validity • support technical arguments • draw conclusions • communicate effectively to a range of stakeholders (GDC4, GMC8) **S2.23 Present data in an appropriate format:** • using appropriate statistical techniques, including the use of data from laboratory information management systems (LIMS) • in a clear and unambiguous way, taking into account the level and experience of the audience and the purpose • using technical language correctly, and using graphics and other tools to aid understanding • using digital technology competently and confidently to produce, design and create charts and graphs: o line graphs o pie charts o bar chart o results tables o histogram • organising data logically and coherently (GMC6, GEC1, GDC1, GDC2) **S2.24 Use relevant information from online databases to review scientific tasks, in relation to:** • appropriateness of statistical techniques (for example, similar published studies)

Laboratory data processing and analysis	
	• data previously obtained (for example, from a laboratory information management system (LIMS)) **S2.25 Recognise when results are invalid against standards and controls by:** • using ongoing calculations to monitor results and identify anomalies • calculating Rf values and comparing to known values **S2.26 Source expert help, when required, in relation to laboratory data processing and analysis by:** • accurately describing the issue • summing up key points • expressing opinions and supporting these with relevant and persuasive arguments • asking and responding to questions for clarification (GEC6) **S2.27 Use standard software to process, analyse and present results from scientific tasks:** • spreadsheets: process data and produce graphical representations • word processing: present results • presentation software: present results

Reviewing and improving laboratory methods and use of equipment	
Knowledge - What you need to teach	**Skills - What you need to teach**

Reviewing and improving laboratory methods and use of equipment	
The student must understand: **K2.9 The importance of using laboratory-reviewing strategies:** • to identify possible problems and recommend improvements with laboratory methods, tasks and use of equipment **K2.10 Why laboratory documents are created, reviewed and approved:** • to ensure consistency and quality • to follow regulatory requirements (for example, good laboratory practice (GLP) **K2.11 How laboratory documents can be amended to implement improvements both to methods and equipment use, by:** • proposing amendments to working instructions/procedure • gaining approval for changes and amendments • validating amendments • adopting amendments and editing associated documentation • monitoring the process/results **K2.12 The purpose of computer modelling and simulation in the laboratory environment:** • to identify the possible effects of modelling changes to complex procedures before implementing them • to try out changes to method or equipment without dismantling and incurring the associated costs or disruption **K2.13 The stages of analytical method transfer when adopting an alternative laboratory method, following regulatory guidelines:** • determining the feasibility of methods and available equipment for own laboratory (receiving laboratory)	The student must be able to: **S2.28 Review and modify a scientific method to improve the task:** • ensuring correct order of steps for efficiency and effectiveness (for example, substances are at the correct temperature at the required stage) • equipment in terms of precision and accuracy (for example, measuring cylinder versus burette) • ensuring the techniques used are efficient and effective **S2.29 Implement changes to a scientific task through the adoption of a continuous improvement cycle:** • identify the issue, organise ideas and information logically (for example, faulty equipment/reagents) • plan and record required improvements, using digital tools and other aids • implement the improvements • check the effectiveness of the improvements by responding to questions/feedback from colleagues • review improvements and adjust, if required (GEC2)

Reviewing and improving laboratory methods and use of equipment	
• setting the scope and objectives of the transfer • acquiring samples or standards from the transferring laboratory • training of laboratory staff at the receiving laboratory • validating results from both laboratories • adopting the alternative method within the laboratory **K2.14 The importance of quality control in the laboratory environment:** • to determine appropriate performance of laboratory equipment • to ensure methods are producing consistent results	

Performance outcome 3: Identify and resolve issues with scientific equipment or data errors

Equipment management	
Knowledge - What you need to teach	**Skills - What you need to teach**
The student must understand: **K3.1 The principles of maintaining, cleaning, calibrating and validating laboratory equipment used to undertake scientific techniques commonly found in a laboratory environment:** • interpreting manufacturers' instructions • employing the correct test equipment • following appropriate SOPs for cleaning and maintenance • using appropriate cleaning materials	The student must be able to: **S3.7 Resolve issues with a range of scientific equipment:** • ensuring equipment is in working order and free from dirt or contamination • recalibrating equipment according to manufacturers' instructions and standard operating procedures (SOPs) • resetting, following manufacturers' instructions and SOPS **S3.8 Carry out and record routine cleaning and maintenance of equipment:**

Equipment management	
• maintaining cleaning and equipment records • notifying issues with equipment to other users and sourcing expert help when required • safely disposing of equipment that cannot be repaired **K3.2 The importance of recognising equipment faults/technical issues in laboratory equipment used to undertake scientific techniques commonly found in a laboratory environment:** • the potential impact on laboratory results • potential health and safety risks • financial impact (for example, lost time, equipment needs to be replaced) • impact on other users' ability to use the equipment	• following appropriate SOPs for cleaning and maintenance (for example, maintenance schedule) • using appropriate cleaning materials before use (for example, rinsing burette with deionised water) • using appropriate cleaning materials after use • using relevant technology effectively (for example, on LIMS) (GDC1) **S3.9 Recognise when a piece of equipment is producing inaccurate data by:** • identifying anomalous results from repeated measurements • the use of appropriate controls **S3.10 Recognise when equipment is likely to be damaged or cause injury due to malfunction:** • inability of the equipment to be zeroed • fails calibration check • visual checks of the equipment (for example, exposed wires) • by the use of appropriate controls • through anomalous results of repeated measurements **S3.11 Report faults and source expert help when required, by:** • following escalation process • communicating the issue appropriately: o labelling the equipment as out of action o using digital communication where appropriate (for example, email, virtual/collaborative meeting tools) • accurately describing the issue:

Equipment management	
	○ summing up key points ○ expressing opinions and supporting these with relevant and persuasive arguments ○ asking and responding to questions for clarifications (GDC3, GEC6)

Laboratory data errors	
Knowledge - What you need to teach	**Skills - What you need to teach**
The student must understand: **K3.3 The factors that can contribute to data errors (random or systematic) in a laboratory:** • contamination of samples or equipment • incorrect sample storage (for example, temperature) • working outside acceptable tolerances • incorrect laboratory equipment used (for example, using the wrong sized pipette) • inadequate training (for example, use of the equipment or procedure) • equipment incorrectly set up, calibrated, or used • method not followed (for example, standard operating procedure not followed) • transcription errors **K3.4 How to minimise errors in scientific tasks, by:** • reading and following the risk assessment and COSHH sheets	The student must be able to: **S3.12 Identify how data errors could have occurred in scientific tasks:** • contamination of samples or equipment • incorrect sample storage • equipment working outside acceptable tolerances • incorrect laboratory equipment used (for example, using the wrong sized pipette) • equipment incorrectly used or set up • method not followed (for example, standard operating procedure not followed) • transcription errors **S3.13 Identify when a random or systematic error has occurred in scientific tasks:** • gathering and interpreting data efficiently and in an appropriate format (for example, chart or graph) • comparing results against previous data (GDC4)

Laboratory data errors	
• planning the work and workplace requirements • following a validated method • maintaining excellent housekeeping (for example, ensuring samples do not become contaminated) • ensuring equipment is calibrated, set up and used correctly • only undertaking scientific tasks following adequate training • storing and labelling samples and standards correctly • working safely in a laboratory setting (for example, safely disposing of materials) **K3.5 The principles of good documentation practice (GDocP) to prevent data errors:** • creation: o recording information as the work is performed o handwritten entries are in indelible ink and are legible and in full • approval: o signed and dated by authorised personnel • document maintenance: o regularly reviewed and kept current o ensuring electronic records are backed up • document modification: o signed and dated by authorised personnel o ensuring access to documents is controlled **K3.6 How to report and correct recording errors:**	**S3.14 Address non-routine problems with samples and instrumentation in a scientific task:** • identify the error • quantify the error to determine if this is within accepted tolerance • remove or minimise the sources of error • record the source of error and the action taken (GMC2) **S3.15 Take steps to minimise errors in scientific tasks following continuous improvement techniques:** • plan: o planning the work and workplace requirements o reading the risk assessment and COSHH sheets • do: o following the risk assessment and COSHH sheets o following a validated method o maintaining excellent housekeeping (for example, ensuring samples do not become contaminated) o only undertaking scientific tasks following adequate training o working safely in a laboratory setting (for example, safely disposing of materials) • check: o checking equipment is calibrated, set up and used correctly o checking that storage and labelling of samples and standards is correct

Laboratory data errors	
• crossing out the error so it is still visible and entering new value • signing and dating correction • reattaching sheets that have become loose with sticky tape and ensuring the edges have been signed • implementing tracked changes on electronic databases • giving reasons why the correction has been made • following laboratory protocols for error reporting	○ continuously monitor data and ensuring procedures are carried out correctly • act: ○ implementing changes to equipment or method ○ repeating any measurements as required

Occupational specialism - technical: food sciences

Knowledge and skills are set out side-by-side within their themed sections. The numbering is sequential throughout the performance outcome, from the first knowledge statement, following on through the skills statements. The ‘K’ and ‘S’ indicate whether the statement belongs to knowledge or skills.

Mandatory content

- Performance outcome 1: Perform appropriate activities to support the food supply chain complying with regulatory requirements
- Performance outcome 2: Develop new food and food related products to support the food supply chain
- Performance outcome 3: Identify and resolve issues in the food supply chain
- Performance outcome 4: Collect, analyse and interpret food production data

Glossary

Customer

The organisation who buys goods or services from a supplier or manufacturer is known as the customer. The customer may also be known as buyer or client. For the purposes of this qualification, the customer is always the retailer (for example food service).

Consumer

The consumer is the ultimate user of the goods. The consumer is the shopper who will consume the bought product.

Performance outcome 1: Perform appropriate activities to support the food supply chain complying with regulatory requirements

Planning methodologies	
Knowledge - What you need to teach	**Skills - What you need to teach**

The student must understand:
K1.1 How the following planning methodologies support performance of activities within the food supply chain:
• time management:
  ○ supports in meeting customer deadlines
• risk assessment:
  ○ supports in working safely
• critical path analysis:
  ○ supports in identifying areas of weakness in process
• objective setting:
  ○ supports in working effectively as opposed to efficiently
	The student must be able to:
	S1.71 Use a range of planning methodologies when performing activities to support the food supply chain:
	• time management:
	  ○ planning time to achieve objectives
	  ○ prioritising tasks
	• risk assessments:
	  ○ identifying how to mitigate risk
	• critical path analysis:
	  ○ identifying areas of weakness
	• objective setting:
	  ○ determining specific, measurable, achievable, realistic and timely objectives
	S1.72 Identify the appropriate food safety and health and safety procedures that need to be in place to support food safety and regulatory compliance, within a specific area of the food supply chain (for example, growers/suppliers, transportation, production, distribution, retail):
	• health and safety: applicable to all areas of the food supply chain
	• Hazard Analysis and Critical Control Points (HACCP): applicable to all areas of the food supply chain
	• food safety management: applicable to all areas of the food supply chain

Planning methodologies	
	• technical and quality management: applicable to all areas of the food supply chain • microbiology: applicable to all areas of the food supply chain • raw materials: applicable to growers and suppliers • food science: applicable to production • food technology: applicable to food production • food supply chain from end to end: applicable to all areas of the food supply chain

Legislation, regulations and ethics in the food and drink industry	
K1.2 The difference between safety and quality within the food and drink industry: • safety - ensuring food and drink products are not going to cause foodborne illness, or anything injurious to health • quality - ensuring food and drink products are consistent with the quality and contents indicated on the nutritional information and ingredient labels **K1.3 The required legal characteristics of food and drink businesses:** • the requirement to register any food/drink business with the local authority before trading, either online or direct to the public (including the number of days in advance the registration needs to take place) • the requirement for all food handlers to be trained commensurate with the activities they intend to undertake within the food/drink business	**S1.73 Identify the labelling requirements of food and drink products to comply with the required legislation and regulations:** • nutritional information • quantitative ingredients declaration (QUID) • calorific values • all ingredients, with allergens emphasised (for example, in bold) • origin of raw materials • use by and best before dates • weights and measures **S1.74 Carry out a supplier assurance risk assessment to ensure food safety, by checking:** • achievement grading and how recent external certification has been achieved by the supplier (for example, Brand Reputation

Legislation, regulations and ethics in the food and drink industry	
• the requirement for specific authorisation to practice in certain industries (for example, meat, dairy, slaughterhouse) • the requirement for traceability of raw materials from point of origin, including cattle movement (field to fork) • the requirement for the welfare and handling of animals **K1.4 The purpose of relevant legislation and regulations that apply to the food and drink industry, in relation to:** • food and drink safety: ensure the production environment is suitable, food is safe to eat, product is as specified, and food will not cause harm to the consumer • food and drink labelling: ensure consumers can make informed choices about food by making it mandatory to display certain information (for example, allergen information) • weights and measures: ensure product meets required standards and protects the consumer **K1.5 The difference between legislation and industry standards/codes of practice within the food and drink industry:** • legislation: what food and drink suppliers must do by law • industry standard/code of practice: what food and drink suppliers do to ensure that what is produced meets the required standard **K1.6 The requirements of industry standards and codes of practice within the food and drink industry:** • industry standards (for example, BRCGS, Red Tractor Assurance): requires that food is produced to a specified standard	Compliance Global Standards (BRCGS), Safe and Local Supplier Approval (SALSA)) • the controls that the supplier has in place (for example, pre-requisites, HACCP plan, allergen controls) • the training of the supplier's staff (for example, food safety, health and safety, standard operating procedures) • the supplier's reputation in industry (for example, references from other companies, customer satisfaction) • the supplier's experience of supplying that ingredient • previous use of the supplier **S1.75 Carry out a Threat Assessment and Critical Control Points (TACCP) risk assessment on the following potential areas of weakness:** • people: o internal, including disaffected workers and agency staff o external, including screening and escorting of contractors and visitors, unauthorised access by radical groups (bioterrorism) • premises: o access for people, including between car parks and production areas o access for delivery vehicles o general site security, including boundary fencing/walls, lighting, mail security, prohibited use of portable electronic equipment • process: o access to production areas (for example, lone workers unsupervised access in production areas)

Legislation, regulations and ethics in the food and drink industry	
• technical processes/quality management systems (for example, good manufacturing practice): provides frameworks for processes and procedures to ensure that food is safe to eat • industry codes of practice (for example, ice cream, meat, dairy): provides industry/product specific processes and procedures to ensure food and drink meet required standards • internal and external specifications (for example, raw material specifications, internal manufacturing/production specifications and final product specifications): defines the food safety and quality of the product to meet customer requirements **K1.7 The purpose of relevant environmental legislation and regulations that apply to the food and drink industry:** • pollution of water sources (for example, avoiding the release of effluent into streams/water courses, avoiding flushing food down drains): to avoid contamination of water sources • recycling (for example, food and packaging waste): to reduce waste going to landfill • emissions (for example, light, noise or odour from food and drink processing): to reduce emissions **K1.8 The purpose of social, environmental and economic sustainability within the food supply chain:** • to protect local communities and the environment from the impact of the food and drink industry **K1.9 The purpose of the following risk assessment procedures used at each stage of the food supply chain, including**	○ machine security to prevent unauthorised access ○ raw material intake checks, product security (for example, tamper proof packaging) • services: ○ protection of utilities, drainage systems, air inlets/vents, cleaning systems, particularly chemical controls • distribution: ○ access to depot and vehicles, vehicles en route, service and rest areas **S1.76 Utilise horizon scanning tools to search for and gather evidence efficiently, in relation to potential food fraud:** • alerts: ○ checking the Food Standards Agency (FSA) website ○ checking the Food Authenticity Network website ○ checking the Rapid Alert System for Food and Feed website portal (RASFF) • natural disasters: ○ checking the Foreign and Commonwealth Office website • civil disturbance: ○ checking the Home Office website (GDC4)

Legislation, regulations and ethics in the food and drink industry	
procurement, food production, processing, packaging, storage requirements and distribution: • supplier assurance risk assessment: ensures raw materials are purchased from safe sources • TACCP: protects food from malicious acts (for example, food defence) • Vulnerability Assessment and Critical Control Points (VACCP): prevents adulteration or substitution of ingredients (for example, food fraud) • horizon scanning: to identify potential alerts, natural disasters and civil disturbances that could result in food fraud **K1.10 The purpose of ethical trading initiatives in the food and drink industry:** • to ensure the sustainability of raw materials (for example, fishing, farming and use of palm oil) • to ensure the welfare of workers including modern slavery, working time and fair trade • to ensure the welfare of animals including free range, transportation and slaughter	

Health and safety in the food and drink industry	
The student must understand: **K1.11 The importance of the following in the food and drink industry to support health and safety:** • personal protective equipment (PPE): to protect the employee and reduce the possibility of physical contamination and injury risks	The student must be able to: **S1.77 Work safely in a food or drink environment, when carrying out a specific task, by always adhering to SOPs, including:** • wearing the appropriate PPE correctly • using correct manual handling techniques: ○ not picking up loads from the floor if possible

Health and safety in the food and drink industry	
• correct manual handling: to prevent injury • ergonomics techniques: to improve the fit between employees and the environment in which they work • using the correct equipment for the task: to prevent injury • safe use of equipment: to prevent injury • standard operating procedures (SOPs): to ensure the safety of employees **K1.12 An employee's responsibility in adhering to health and safety controls within the food and drinks industry:** • PPE: o wearing PPE • staff training: o only carrying out tasks and using equipment for which the individual is trained • risk assessments: o carrying out and following risk assessments • SOPs: o following the step-by-step guide which includes photographic instructions and PPE requirements o knowing who to escalate issues to • Control of Substances Hazardous to Health (COSHH): o following controls for food additives o following SOPs for use and storage of chemicals	o ensuring adequate space to prevent twisting or bending o ensuring a clear, level work area o taking rest breaks when needed o not carrying double loads o adhering to job rotation policies • using the specified equipment safely • using ergonomic techniques: o minimising repetition o varying tasks **S1.78 Carry out a health and safety risk assessment, identifying risks and mitigating factors:** • step 1: identifying the hazard: o machinery and facility hazards (for example, equipment without guards, maintenance of building and equipment) o microbiological hazards (for example, hygiene practices) o chemical hazards (for example, ammonia leak, cleaning fluids mixed incorrectly) o manual handling hazards (for example, incorrect lifting) o slips, trips and falls hazards (for example, spillages, incorrectly stored materials, obstructions in walkways) o blocked fire exit hazards (for example, incorrectly stored materials) o electrical hazards (for example, isolation of equipment) o vehicle hazards (for example, forklifts, vehicles reversing into loading bays)

Health and safety in the food and drink industry	
	• step 2: identifying who might be harmed (for example, machine operator, visitors, contractors, hygiene specialists) • step 3: evaluating the risk and selecting appropriate control measures (for example, identifying if any alternative or safer methods than those proposed can be used; identifying control measures that need to be in place to minimise risks at all times; identifying appropriate PPE; ensuring adequate guarding; identifying the isolation and lock-off of machinery) • step 4: recording the findings and implementation (for example, ensuring any significant findings that require further changes to manage the risks better are recorded, for example, use of additional PPE): o in a clear and unambiguous way o using technical language correctly o organising the findings logically and coherently o using the appropriate grammar, vocabulary and spelling • step 5: monitoring and reviewing risk management o are the current controls still working? o is there any new equipment that needs to be considered? o have any processes changed? o have any lessons been learnt from recent near misses or accidents? (GEC1)

Hazard Analysis and Critical Control Points in the food and drink industry (HACCP)	
The student must understand: **K1.13 The importance of implementing an effective HACCP-based food safety management procedure:** • legal requirement for all food and drink organisations • to identify hazards and put controls in place to eliminate the hazard or reduce it to a safe level • assures the product is safe to eat **K1.14 The pre-requisites procedures that need to be in place in a food or drink business prior to implementing a HACCP-based food safety management system:** • approved suppliers: o process for supplier approval • allergen procedure and controls: o segregation o separate, colour coded PPE (for example, red hairnets) o captive tools, utensils and equipment • incoming materials specifications: o goods-in checks • training for staff: o basic food hygiene o critical control points • cleaning: o schedules o equipment • suitable premises: o glass/hard plastic procedure • pest control: o types of pests	The student must be able to: **S1.79 Contribute to a HACCP plan for a simple product, by creating a HACCP flow diagram as outlined in step 4 of the 12 HACCP steps:** • using the appropriate style for the type of communication and audience (for example, technical function, engineering function, production function) • ensuring that the diagram is clear and concise • using the appropriate level of detail for audience and purpose • using correct terminology, grammar, spelling and punctuation, proofreading to ensure accuracy • using relevant digital devices and media as appropriate (for example, computer and application diagramming software) to construct the flow diagram (GEC3, GDC1)

Hazard Analysis and Critical Control Points in the food and drink industry (HACCP)	
○ use of contractors • internal auditing to maintain best practice: ○ good manufacturing practice (GMP) ○ good hygiene practice (GHP) **K1.15 The application of the 7 principles of HACCP in order to implement and maintain a HACCP-based food safety management system:** • principle 1: conducting a hazard analysis, considering all possible hazards, risk-assessing all hazards and identifying controls: ○ microbiological hazards: bacteria, viruses, protozoans, moulds, parasites, algae: ▪ controls: effective training, effective personal hygiene, effective cleaning procedures, effective cooking procedures, effective cooling procedures, effective stock control ○ physical hazards: foreign bodies which may be from the following sources: people, pests, raw materials, packaging, equipment, cleaning activities, buildings, sabotage: ▪ controls: effective training and supervision of staff, effective personal hygiene, effective pest control, following SOPs, regular planned preventative maintenance, effective cleaning ○ chemical hazards: which may be from following sources: in raw materials from pesticides, fungicides, metals in fish or vegetables, antibiotics/hormones in meat, industrial chemicals, natural toxins, during preparation, fumes, cleaning chemicals, pesticides, metals, excess additives, migration from packaging:	

Hazard Analysis and Critical Control Points in the food and drink industry (HACCP)	
▪ controls: use of reputable suppliers and safe packaging, following manufacturer instructions for use of cleaning chemicals, correct storage of cleaning chemicals, use of approved pest control contractors, no cleaning over open food ○ allergenic hazards: introduced as a result of poor segregation or cleaning: ▪ controls: use of approved suppliers, following stringent allergen control procedure, strict segregation • principle 2: identifying critical control points (CCPs): ○ control is used to eliminate a food safety hazard or reduce it to a safe level • principle 3: establishing the critical limits: ○ a maximum and/or minimum value (must not be a range) is allocated to a hazard in order to prevent, eliminate or reduce the hazard to an acceptable level • principle 4: monitoring CCP: ○ what: is being monitored (for example, critical limits, target levels and tolerances) ○ how: the monitoring should be undertaken, including equipment and calibration ○ where: the monitoring should be undertaken (at, or as close as possible to, the CCP) ○ who: is responsible for the monitoring ○ when: the monitoring should be undertaken, including continuous or batch (must be frequent enough to ensure that the hazard is controlled - without requiring significant destruction of product)	

Hazard Analysis and Critical Control Points in the food and drink industry (HACCP)	

• principle 5: establishing corrective actions:
  ○ identifying actions to be taken if the process breaches the critical limits
  ○ corrective actions should take place before the critical limit is breached
  ○ corrective actions will bring CCP back under control and deal with any effected product
• principle 6: verifying and validating:
  ○ verification: the methods, procedures, tests, which are used, in addition to monitoring, to establish if the HACCP system is functioning as planned
  ○ verification questions such as:
  ▪ are the critical limits being complied with?
  ▪ are monitoring procedures being accurately followed?
  ▪ are corrective actions being implemented as per the HACCP plan?
  ▪ is the plan being regularly verified?
  ○ validation: obtaining evidence (for example, from scientific literature, legislation, ongoing reviews, international guidance, food standards and industry guides, pre-production trials) to validate that the HACCP plan is effective, especially the CCP and critical limits
  ○ reviews - at regular intervals (at least annually): if new scientific data emerges, when a confirmed complaint or illness occurs, when the raw materials or recipe changes, when equipment or the process is changed, when storage conditions or product use changes, when packing or distribution is changed, following modification of the HACCP plan	

Hazard Analysis and Critical Control Points in the food and drink industry (HACCP)	
• principle 7: record-keeping, documentation required for: due diligence, legal requirement, customer requirement, assists in investigation of complaints, identifying areas of weakness, may identify training needs, can be used for trend analysis. Records to include: o HACCP plan, including details of how it was developed o pre-requisites programmes o floor plan including segregation of high/low risk areas o approved supplier list o monitoring records **K1.16 How to implement and maintain a HACCP-based food safety management system, by following the detailed requirements of the following 12 steps:** • step 1: assembling the HACCP team, including: o training of staff o responsibilities of the team • step 2: describing the product and its distribution, including: o composition o hazards o suitability for microbial growth o processing methods o storage o distribution o shelf life o packaging o labelling o legal requirements	

Hazard Analysis and Critical Control Points in the food and drink industry (HACCP)	

• step 3: identifying the intended use of the product and consumers, including:
  ○ likely consumers, including sensitive and vulnerable groups
• step 4: constructing the flow diagram to describe the process:
  ○ a systematic representation of the steps or operations involved, often from purchase to the consumer
• step 5: on-site confirmation of flow diagram:
  ○ ensuring the flow diagram represents what happens in practice (for example, is it accurate for every occasion, and over every shift?)
• step 6: conducting a hazard analysis:
  ○ identifying possible hazards at the steps in which they are likely to occur
  ○ risk-assessing all hazards
  ○ identifying controls to mitigate the risks
• step 7: determining critical control points:
  ○ determining the steps in the process where control measures need to be in place to prevent, eliminate or reduce the hazard to an acceptable level
  ○ control procedures must be in place for each CCP
  ○ CCPs to be identified using the Codex Alimentarius decision tree, which is essentially a series of questions to determine whether a step is a control point or a critical control point
• step 8: establishing critical limits for each critical control point:
  ○ these are the values of monitored actions, separating the acceptable from the unacceptable	

Hazard Analysis and Critical Control Points in the food and drink industry (HACCP)	
○ quantifiable limits are preferred and, if possible, the results should be obtained immediately on site ○ target levels can also be identified, and these may enable a potential breach of a critical limit to be detected and remedied before the food becomes unfit • step 9: establishing a monitoring system for each critical control point, including: ○ monitoring of control measures at each CCP ○ this is essential to confirm that a process is under control and critical limits are not exceeded ○ it can be automatic or manual, and must permit rapid detection and correction ○ procedures should state what the critical limits are, where the monitoring should be undertaken, when the monitoring should be done and who is responsible for the monitoring • step 10: establishing corrective actions, including: ○ the actions to take when a critical limit is breached ○ usually there are 2 distinct actions: ▪ deal with the affected product ▪ bring the process back under control ○ procedures should specify the action to be taken, who is responsible for taking the action, who should be notified and whether production needs to be stopped/restarted • step 11: establishing verification procedures: ○ this involves the use of methods, procedures and tests in addition to those used in monitoring to determine	

Hazard Analysis and Critical Control Points in the food and drink industry (HACCP)	
compliance with the HACCP plan and ensure it is effective and valid • step 12: establishing documentation and record-keeping requirements: o these must be proportionate to the size and type of business o must demonstrate food safety is being managed and records are also useful to support a due-diligence defence, when investigating complaints and when auditing a system	

Food safety management	
The student must understand: **K1.17 The importance of food safety management systems in a food and drink industry:** • ensures a systematic approach • ensures regulatory compliance required by law • ensures control of risks and hazards to ensure food is safe • ensures the production of safe food • ensures traceability • ensures due diligence (for example, record-keeping) **K1.18 The importance of following the correct practices for maintaining good personal hygiene within the food and drink industry:** • handwashing: to reduce the risk of microbiological contamination • PPE, including restrictions of use: to reduce the risk of physical contamination	The student must be able to: **S1.80 Maintain and implement a food safety management system within a production facility by:** • following policies and procedures (for example, pre-requisite and critical control procedures) • completing necessary paperwork (for example, for monitoring and recording) • wearing the PPE provided • being fit for work and reporting illnesses, as per organisational policies and procedures • escalating hazards **S1.81 Carry out monitoring and recording of food safety controls, ensuring all information is recorded accurately and precisely:** • temperature checks: o to check consistent cooking and chilling temperatures and times • equipment and maintenance checks:

Food safety management	
• restrictions on the wearing of make-up (for example, false nails, eyelashes): to reduce the risk of physical contamination • restrictions on the wearing of jewellery: to reduce the risk of physical contamination • fitness to work including reporting of illnesses and infections: to reduce the risk of microbiological contamination • covering of wounds with correct dressings (for example, blue, waterproof, metal-detectable strip): reduce the risk of microbiological or physical contamination • restrictions on the use of perfumes/aftershaves: reduce the risk of chemical contamination **K1.19 The correct procedures for maintaining good food safety and hygiene within the food and drink industry (the 4Cs):** • cleaning, including cleaning schedules • cooking, including correct temperature and cooking times • chilling, including correct temperature, keeping food out of the danger zone and correct storage • cross-contamination, including segregation **K1.20 The 4 food safety hazards and the risks associated with them:** • microbiological (for example, bacteria, viruses, fungi - yeasts and moulds): o risks to include: food poisoning, foodborne disease, food spoilage • physical (for example, hairs, buttons, fingernails, pest droppings/fur/feathers): o risks to include: choking, cuts in the mouth, broken teeth	o to detect the potential for physical contamination, calibration of equipment to ensure accuracy of equipment • incoming raw material verification checks: o to ensure they meet the raw materials specifications and are contamination free • final product checks: o to ensure it meets the final product specifications • cleaning checks: o to ensure work/production areas are contamination free • training records: o to ensure staff are trained to carry out the task against the current procedure • allergen controls: o to ensure allergenic ingredients are segregated (GMC1) **S1.82 Review food safety management controls, by:** • identifying non-conformities • suggesting corrective actions

Food safety management	

• chemical (for example, cleaning chemicals, natural chemicals, pesticides, food additives):
  ○ risks to include: sickness, unpleasant taste, long-term damage to the body
• allergenic (for example, peanuts, cereals containing gluten, tree nuts, sesame seeds, eggs, milk, soya beans, mustard, sulphur dioxide, lupin, celery, fish, crustaceans, molluscs):
  ○ risks to include: mild to moderate allergic reactions, anaphylaxis, death
K1.21 The main responsibilities for all food and drink businesses in relation to food safety management, with reference to the relevant food safety legislation:
• businesses must not include anything in food or drink, remove anything from food or drink, or treat food or drink in any way which means it would be injurious to the health of the identified consumer
• the food and drink that businesses serve, or sell must be of the nature, substance or quality which consumers would expect
• food and drink must be labelled, advertised and presented in a way that is not false or misleading
K1.22 The potential implications of not complying with the relevant food safety legislation:
• prosecution of individual and/or business
• loss of custom
• reputational damage
• fines
• prison sentence
• staff wellbeing (for example, morale)
• loss of job	

Food safety management	
• possible closure of food and drink operations • injury to consumer **K1.23 The responsibilities of employers in relation to the maintenance of a food safety management system in a food and drink business:** • providing the correct premises and equipment, including PPE • providing ongoing resource (for example, raw materials, staffing, utilities) • carrying out preventative maintenance • implementing the correct pre-requisite requirements • implementing an effective food safety management system based on the HACCP principles • staff training • internal audits **K1.24 The responsibilities of employees in relation to the maintenance of the food safety management in a food business:** • undertaking mandatory training dependent on role • following policies and procedures as detailed in the SOPs • completing necessary paperwork • wearing the PPE provided • being fit for work and reporting illnesses, as per organisational policies and procedures • escalating hazards **K1.25 The purpose of monitoring food safety management systems:** • ensuring food safety hazards are under control	

Food safety management	

• ensuring procedures are being correctly implemented and followed
• ensuring regulatory requirements are met
K1.26 The purpose of a range of checks that are carried out to verify food safety:
• equipment and maintenance checks: to detect the potential for physical contamination, calibration of equipment
• incoming raw material verification checks: to ensure the required specifications are met and the raw materials are free from contaminants
• cleaning: to ensure work/production areas are free from contaminants
• training records: to ensure staff are competent to carry out the task in line with the current procedures
• allergen controls: to ensure allergenic materials are handled correctly to prevent cross-contamination
• temperature checks: to ensure the product meets the required cooking/chilling temperature and remains safe to consume
• final product checks: to ensure it meets the final product specifications
K1.27 The methods used for pest control and prevention within the food and drink industry:
• staff training to recognise and report signs and types of pests
• pest-proofing of premises:
  ○ fly screens on windows
  ○ strip curtains
  ○ drain covers
• clean-as-you-go procedures
• waste control procedures	

Food safety management	

• reduction of vegetation around buildings
• building maintenance (for example, having a rock or gravel perimeter around facility)
• correct storage of raw materials
• scheduled monitoring procedures:
  ○ the use of external qualified contractors for monitoring and control
  ○ bait boxes
  ○ electric fly killers
  ○ traps
• inspection of deliveries:
  ○ raw materials and their transportation	

Technical and quality management in the food industry	
The student must understand:	The student must be able to:

K1.28 The difference between quality assurance and quality control within the food and drink industry:
• quality assurance:
  ○ failure prevention
  ○ in-process checks against specification
  ○ ongoing planned maintenance
  ○ instrument calibration
  ○ ownership of stages in the process
• quality control:
  ○ failure detection
  ○ final product testing
  ○ final specification checks
	S1.83 Carry out an internal audit by following the appropriate stages and demonstrating skills of a good auditor:
	• carrying out an opening meeting, responding to any questions for clarification as appropriate
	• carrying out the audit using an audit checklist, ensuring all previous non-conformities have been closed out
	• observing practices, asking appropriate and relevant questions to clarify any required areas, and listening actively to responses
	• recording non-conformities and good practice
	• writing the report

Technical and quality management in the food industry	
K1.29 The function of the following organisations in relation to the safety and quality of food and drink: • FSA: ensures food is safe to consume, concerned with national and global issues • local authority: concerned with local issues: o Trading Standards: to maintain integrity of product, weights and measures o Environmental Health: ensures food is safe to consume • advisory research organisations (for example, Leatherhead Food Research, Campden BRI): provide expertise and specialist advice to manufactures to help make food safe **K1.30 The procedures and controls that contribute to a food safety and quality management system within food and drink operations:** • pre-requisite procedures • traceability procedures • industry standards including specific product standards, labelling requirements and Brand Reputation Compliance Global Standards (BRCGS) • customer specifications • nutritional analysis process • critical controls • weight control/portion size as identified in the product specification **K1.31 The difference between internal and external audits in the food and drinks industry:** • internal audits: carried out by an employee (first-party audit) o to ensure the whole operation is meeting the specified requirements • carrying out a closing meeting, summing up key points, agreeing corrective actions and timescales for completion (GEC6) **S1.84 Review a specific food safety and quality management procedure to ensure that the food quality or food safety standard will be met (for example, cooking temperature, overall product quality, storage requirements, allergen controls, product nutritional value).**	

Technical and quality management in the food industry	
○ identifying actions and controls to improve systems • external audits: carried out by the manufacturer on the supplier (second-party audit) and/or carried out by an external organisation (for example, FSA/local authorities/certification bodies such as BRCGS) on the food and drink manufacturer (third-party audit) ○ to ensure the business is meeting customer and/or accreditation requirements **K1.32 The purpose of different types of audits:** • system audit: identifies if a documented food safety and quality system meets specific requirements of a relevant food safety and quality standard (ISO 17025) • compliance audit: examines if all aspects of a prescribed food safety and quality system, including observation of the activity, are being complied with, working well and are maintained on a continual basis • horizontal audit: looks at one discrete or particular aspect of the quality system (for example, training) • vertical audit: a narrow focus on a particular aspect of a product • follow-up audit: to verify corrective actions have been implemented and have resolved the non-conformity • unannounced audit: unscheduled; used to ensure audit standards are maintained at all times, and can be implemented if a customer has complained, if there is an internal non-conformity or if there is a breakdown in process	

Microbiology	
The student must understand: **K1.33 A range of common pathogenic bacteria that can cause foodborne illness and disease and examples of the food products with which they are associated:** • Campylobacter jejuni - chicken, other raw meats • Bacillus cereus - white rice • Salmonella spp. - chicken, eggs • Clostridium botulinum - low acid canned goods • Clostridium perfringens - stews, rolled meats • Staphylococcus aureus - poor personal hygiene • Listeria monocytogenes - soft cheese, chilled products • Escherichia coli O157 - raw and undercooked meats **K1.34 How pathogenic agents may affect at-risk groups:** • infants and babies (for example, pathogenic agents, such as Salmonella spp. and Escherichia coli O157 can cause diarrhoeal diseases, which can lead to dehydration in babies and infants • the elderly (for example, gastrointestinal pathogenic bacteria, such as Campylobacter jejuni, Clostridium perfringens and Salmonella spp. can affect the elderly as they have slower digestion, which allows bacteria extended time to grow in the gastrointestinal tract) • pregnant people (for example, Listeria monocytogenes infection during pregnancy can cause miscarriage, stillbirth, uterine infection and preterm delivery)	The student must be able to: **S1.85 Take swabs from food contact surfaces, including hard-to-reach areas, following a sampling procedure:** • identifying the area to be swabbed (food contact surfaces, non-food contact surfaces, zones of risk) • identifying the required number of swabs • taking appropriate number of swabs to produce reliable results • following the specified swabbing process: ○ removing moistened sterile swabs from the holding tube and wiping across the test area in a rotating movement • maintaining integrity of swabs **S1.86 Use laboratory techniques, skills and equipment to identify any pathogens (causative agents) present on swabbed food surface areas:** • laboratory skills: ○ accurate recording of information ○ hand-to-eye coordination ○ problem solving • laboratory techniques and equipment: ○ using pre-prepared detection kits: ▪ after swabbing the area, the swabs should immediately be placed into the detection tube ▪ detection tubes should be incubated as per manufacturer's instructions ▪ detection tubes are observed for colour changes and results recorded ○ using aseptic technique to transfer sample from swabs to growth medium:

Microbiology

- immuno-compromised: (for example, decreased immune systems means they may be more susceptible to foodborne illness)

K1.35 How to identify pathogenic bacteria which cause foodborne illness and disease:

- observation of, and reported, symptoms can signal initial awareness of a foodborne illness
- laboratory techniques used to identify pathogens (causative agents):
  - general identification techniques (for example, Gram-positive, Gram-negative):
    - aseptic techniques (for example, plating): purposeful growing of pathogens (causative agents) to allow for identification, can make use of selective media to allow for isolation of specific pathogens (causative agents)
  - differential staining techniques: use of specific stains and dyes that provide contrast images that enable identification of specific pathogens (causative agents) by their shape or specific features
    - microscopic examinations: identification of pathogens (causative agents) by direct observation of the gross structures and specific observable features, using a range of microscopes, including scanning electron microscopes
  - specific identification techniques (for example, identification of a specific strain of bacteria):
    - biochemical reactions: identification based on biochemical characteristics of pathogens (causative agents) such as nutritional and metabolic capabilities
    - holding the swab in one hand, using sterile tweezers (if required) and lifting the lid of the petri dish with the other hand
    - only lifting the lid as far as required to drag the swab across the surface in a zig-zag pattern
    - replacing the lid of the petri dish, sealing, and labelling
    - disposing of the swab correctly (for example, not placing it on the bench)
  - using differential staining technique for Gram staining:
    - rolling the swab over a clean slide, using sterile tweezers if needed
    - heat-fixing the slide
    - applying stains and rinses in the correct order
    - examining the smear, using a light microscope, and identifying if bacteria are Gram-positive (violet in colour) or Gram-negative (pink in colour)

S1.87 Identify hygiene process failures, by:

- interpreting results of samples
- providing evidence-based recommendations to improve the hygiene controls of the swabbed areas (for example, cleaning procedures, personal hygiene improvements)

Microbiology	
▪ subtyping: genetic analysis of different samples of pathogens (causative agents) to identify the similarity between them ▪ serological typing: identification of pathogens (causative agents), particularly those that are difficult to culture, through testing for the presence of pathogen-specific antibodies in blood ▪ phage typing: used for the identification of a single strain of bacteria by the use of bacteriophages ▪ immunoassay: identification of pathogens (causative agents) through testing for the presence of pathogen-specific antibodies **K1.36 How a range of food safety and hygiene measures are used to control pathogenic bacteria:** • HACCP: o food safety management system which identifies hazards and puts controls in place • personal and environmental hygiene practices: o cleaning schedules o handwashing procedures • policies and procedures: o staff sickness reporting procedure o sickness exclusion **K1.37 How to sample an environment, using appropriate laboratory skills and equipment, to identify pathogens (causative agents):** • scheduled environmental swab testing: o conducted on both food contact surfaces and non-food contact surfaces (for	

Microbiology	
example, conveyor belts, drains and rollers) ○ frequency of swabbing of specific areas and number of swabs, determined by where they are within the production process ○ approach taken to environmental swabbing is of 'zones of risk', which is dependent on product and environment ○ following the swabbing process • hand swabs: ○ conducted to ensure the implementation of effective personal hygiene requirements (including handwashing techniques) ○ frequency of swabbing dependent on products being handled and an individual's role in the production process ○ following the swabbing process • water testing: ○ conducted on water samples from a range of sources within the production process ○ frequency of testing determined by regulatory guidelines and organisational SOPs (including HACCP) ○ samples taken by trained individuals ○ processing of samples in-house or by contracted laboratories • adenosine triphosphate (ATP) swabbing and monitoring techniques: ○ a test which determines if ATP is present within a sample ○ ATP is present in all animal, vegetable and microorganisms, and, therefore, the	

Microbiology	
presence of ATP is used as an assessment of contamination ○ standard swabbing techniques used in environmental and hand swabbing are employed but with ATP specific swab sticks ○ these swab sticks are then analysed using a luminometer, which determines the level of contamination in a sample	

Raw materials in the food industry	
The student must understand: **K1.38 What to consider when choosing sources and suppliers of raw materials:** • supplier reputation • self-assessment and/or external audit results • ability to meet specification requirements • industry recognised certification • sustainability • risk assessment to determine suitability of supplier and procedures for any subsequent vetting required **K1.39 The purpose of specifications of raw materials:** • to ensure that companies purchase and distribute food that is safe, of good quality and able to satisfy the needs of each customer • to specify requirements for raw materials • to ensure consistency of raw material supply (for example, seasonal and geographical variations, soil chemical composition)	The student must be able to: **S1.88 Select raw materials as per recipe/client requirement, to ensure that the finished product:** • meets recipe requirements • provides the required nutritional value and organoleptic requirements • meets product specification (for example, preservatives, colour, binding agent, emulsifier, origin of raw materials) **S1.89 Follow segregation procedures for handling raw materials in order to protect the integrity of products, and to ensure origin of product is maintained, by:** • using separate PPE/equipment • using separate storage areas • following personal hygiene procedures **S1.90 Follow segregation procedures for handling raw materials to prevent deoxyribonucleic acid (DNA), allergen or microbial cross-contamination, by:** • using separate PPE/equipment • using contaminant free preparation areas

Raw materials in the food industry	
K1.40 What the minimum requirements are for a specification of raw materials: • physical parameters (for example, size, shape, colour) • appearance • odour • flavour • texture • foreign bodies/physical defects • the name of the product and the supplier's item number • components or composition of the material • the presence of regulated or customer-recognised food allergens • pertinent physical, chemical, and microbiological information • shipping and storage information • shelf life • handling instructions **K1.41 The functionality of raw materials:** • to meet recipe requirements • to provide the required nutritional value and organoleptic requirements • to meet specific product requirements (for example, preservatives, colour, binding agent, emulsifier) **K1.42 Systems available for handling raw materials to ensure the integrity of the product is maintained and to prevent cross-contamination:** • storage systems and handling equipment: o racks/trays o shelves	• using separate storage areas • following personal hygiene procedures

Raw materials in the food industry	
○ segregated areas ○ storage bins ○ colour coded utensils and equipment • engineered systems: ○ conveyor ○ robotic • handling of bulk items: ○ bucket elevators ○ silos • industrial trucks: ○ hand trucks ○ pallet jacks ○ forklifts • stock rotation procedures: ○ date coding/day coding/batch identification **K1.43 What to consider when selecting raw materials for a particular product:** • legal requirements • functionality requirements • food safety requirements (for example, allergens) • final product specification **K1.44 How to ensure the quality assurance of raw materials:** • best before and use by dates • checking batch codes • checking labelling • supplier approval • ensuring packaging is not damaged • food allergen information	

Raw materials in the food industry	
• organoleptic • physical testing **K1.45 The importance of the correct storage of raw materials, in particular segregation and protection of integrity:** • to prevent contamination (for example, microbial, foreign bodies, pest infestation, chemical) • to prevent cross-contamination (for example, DNA, allergens and pathogens (causative agents)) • to ensure durability and prevent spoilage • to ensure functionality and materials are fit for purpose **K1.46 The considerations to make when storing raw materials:** • designated areas • segregated areas • temperatures and humidity • stock rotation • adequate space and lighting	

Food science	

The student must understand:
 	
K1.47 The general composition and fundamental role of the main components of different foods:
 	
• carbohydrates:
  ○ macromolecules, composed of one or more monomers containing carbon, hydrogen and oxygen atoms. Classified as monosaccharides, disaccharides or polysaccharides
  ○ a source of energy
  ○ glucose and fructose are examples of monosaccharides; sucrose and maltose are examples of disaccharides; starch is an example of a polysaccharide
  ○ found naturally in honey and fruit (sugars)
  ○ found naturally in the form of fibre, within wholegrain cereals and certain vegetables
  ○ added to a range of confectionery, chocolates and drinks (sugars)
  ○ found in bread, rice, potatoes and pasta (starch)
• lipids:
  ○ a diverse range of molecules, the lipids found in food are commonly referred to as oils and fats and are mainly triglycerides
  ○ used as an energy store, as insulation, in hormone production and in cell membrane formation
  ○ lipids in food include the oils of seeds and grains, as well as animal fats that are found in cheese, milk and meat
• proteins:
  ○ complex macromolecules made up of amino acids, consisting mainly of carbon, hydrogen, nitrogen, oxygen and sulphur
	The student must be able to:
	
	S1.91 Check all customer requirements have been met in order to ensure quality of product and shelf life of food:
	
	• quality of product (for example, to meet nutritional requirements, to reduce additives and preservatives, product formulation)
	• shelf life of product (for example, increasing additives and preservatives, change of packaging, processing methods)

Food science	
○ play a role in the structure and function of cells, including growth and development ○ found in eggs, milk, meat (animal sources) and nuts, grains, legumes (vegetable sources) • water: ○ is a simple molecule ○ plays an essential role in all the activities of body cells, as well as specific roles such as the absorption of nutrients and the removal of waste ○ has a number of roles within food including: maintaining texture, enabling enzyme activity in food, and conducting heat within food ○ the amount of water activity in food (aw) affects the growth of bacteria in food; for example, lowering water content can slow down microbial growth ○ found in virtually all foods, but amount varies considerably; fruit and vegetables are 80 to 90% water • vitamins: ○ a range of compounds that are either water soluble (for example, vitamin C) or fat soluble (for example, vitamin D) ○ required in small amounts for essential metabolic reactions, contributing to the prevention of diseases, and supporting immune system processes. Specific vitamins have specific functions. Vitamins work together (synergistically), supporting a large number of different functions in the body ○ found in fruit and vegetables (vitamins A, C, E, K) meat, poultry, fish, eggs and dairy (vitamin B, D) • minerals:	

Food science	
○ a range of chemical elements, such as calcium, phosphorus, magnesium, iron and zinc ○ required for various functions in the body including developing strong teeth and bones, controlling body fluids inside and outside of cells and to support the transfer of food into energy. Different minerals are needed in different amounts by the body ○ often work synergistically with vitamins ○ found in a range of foods such as cereals, bread, meat, fish, milk fruit and vegetables • enzymes: ○ a specific group of proteins which act as catalysts for biochemical reactions both inside the human body as well as in food ○ many foods contain useful digestive enzymes that can help the body's digestive process, but if food is cooked/processed these enzymes will be destroyed ○ foods containing enzymes include fruit and vegetables (for example, pineapple; also spices such as ginger and natural products such as honey) • food additives: ○ a diverse group of substances ○ some food additives are natural additives or are found in natural sources ○ there is a system for the numbering of additives and different groups of additives such as anticaking agents, carriers and stabilisers ○ used to enhance taste or appearance of foods, also for preservation of food	

Food science	
○ many synthetically produced additives are now common in a range of processed foods • flavourings: ○ a range of natural and artificial compounds used in very small amounts, considered to be a food additive ○ used to enhance flavours, modify taste and/or smell of foods ○ found in a majority of processed foods • colourings: ○ a range of substances from natural sources (for example, lycopene) or artificially produced (for example, titanium dioxide); considered to be a food additive ○ used to modify or enhance the colour of food ○ caramel is an example of a natural food colouring which is widely used in a range of food products from soft drinks to bread **K1.48 The purpose of daily reference intake (RI) in relation to human nutritional requirements (as recommended by the NHS):** • provides an approximation of the quantity of nutrients an individual should consume daily (for example, how much energy, fat, saturates, carbohydrates, total sugars, protein and salt) • provides guidance to support customers in making healthy dietary choices based on an average-sized woman doing an average amount of physical activity **K1.49 What RIs are used to show:** • whether a product is high (red), medium (amber) or low (green) in fat, saturated fat, salt and sugars	

Food science	
• how much energy (calories and kilojoules) it provides **K1.50 The characteristics of a range of fermentation processes, including the food and drink products that are produced as a result of these processes:** • lactic acid fermentation: ○ anaerobic conversion of carbohydrates by a group of bacteria (lactic acid bacteria) ○ these bacteria can independently initiate the fermentation process but may also act in combination with yeast, as in the production of sourdough ○ process does not necessarily require heat ○ results in the preservation and production of a range of food products, including yoghurts and sauerkraut • ethanol fermentation: ○ also known as alcohol fermentation ○ anaerobic conversion of simple sugars into ethanol and carbon dioxide by the action of yeasts ○ in this process venting the carbon dioxide (allowing it to escape) is an especially important requirement to avoid pressure build-up which could cause an explosion within the fermentation vessel ○ wine is produced using this process through the fermentation of natural sugars in grapes ○ beer, whiskey and vodka are produced using this process, through the fermentation of grain starches • fermentation in baking: ○ anaerobic conversion of sugars within bakery products (such as bread) will	

Food science	
produce carbon dioxide, which will cause a dough to rise ○ this conversion is carried out mainly by yeast ○ this process is usually carried out at room temperature, but there are instances where the temperature can be altered ○ it is possible to use additives in the dough to speed up the fermentation process ○ the length of fermentation time has an impact on the overall taste, texture and quality of bakery products, especially in the case of bread **K1.51 The intrinsic and extrinsic factors used to determine the shelf life of food:** • intrinsic factors: ○ initial quality ○ ingredients ○ the inherent nature of the food ○ the product formulation • extrinsic factors: ○ processing methods ○ packaging ○ transportation and storage ○ consumer handling **K1.52 The differences between the use by and best before dates of food and drink and when each are applicable:** • use by: unsafe to eat beyond the use by date and illegal to sell beyond the use by date ○ applicable to: short shelf life, high-risk products including chilled salads, chilled cooked meats • best before: refers to the quality of food, not unsafe to eat beyond the best before date	

Food science	
○ applicable to: long shelf life, low-risk products including canned foods and dried foods **K1.53 How a range of food additives (including preservatives) and ingredients with food additive properties, can extend the shelf life of food:** • salt: reduces bacteria • sugar: reduces water • nitrates: inhibits microbial growth • sulphites: inhibits microbial growth and enzymic action • sorbic acid: inhibits mould and yeast growth • calcium propionate: inhibits mould and yeast growth • sodium benzoate: inhibits mould and yeast growth in high-acid foods	

Food technology	
The student must understand: **K1.54 The 3 main types of energy transfer used in food technology, including examples of where they are used:** • conduction: transferring heat to another item by contact (for example, frying, grilling) • radiation: transferring heat through waves (for example, in the use of microwaves) • convection: transferring heat through the use of liquids (for example, boiling)	The student must be able to: **S1.92 Verify existing procedures are meeting food safety and quality standards:** • heat processing techniques: ○ checking core temperature in food is being achieved • heat removal: ○ checking product is cooled/chilled/frozen within specified timeframe and to right temperature • customer specifications:

Food technology	
K1.55 The difference between a range of heat-processing techniques: • pasteurisation: o involves heating to a specific temperature, usually less than 100°C o acidity of the food determines the exact time and temperature required o can be undertaken on food and drink either before or after packaging • sterilisation: o involves heating to a specific temperature above 100°C o usually the product is canned or bottled and then heat-treated in a steriliser with steam or hot (superheated) water • ultra heat treatment: o involves a very short heat treatment of temperatures above 135°C for one second o can only be used within specific production plants that are able to maintain a sterile atmosphere • baking: o dry heat cooking method carried out in an enclosed space o used as a way to uniformly cook foods o time and temperature dependent on food being produced • frying: o involves the immersion of food in boiling oil o time and temperature dependent on food being produced • grilling: o checking finished product against specification o comparing the colour of cooked product to photographic specification evidence • packaging and labelling meet the required safety and quality standards: o checking the correct packaging and labelling have been used	

Food technology	
○ involves cooking food on a rack over a heat source ○ direct heat quickly sears the outside of food, producing distinctive robust, roasted and sometimes pleasantly charred flavour and crust ○ time and temperature dependent on food being produced • boiling: ○ is a moist-heat cooking method that happens when the temperature of the liquid reaches 100˚ C ○ food is completely submerged in water for even heat distribution ○ the full boil is a vigorous one, where bubbles rapidly and violently break over the entire surface of the water • blanching: ○ involves the rapid immersion of food in steam or boiling water followed by a rapid cooling ○ often used with fruit and vegetables to maintain flavour, colour, texture and nutritional value • evaporation: ○ evaporation is the partial removal of water from liquid food by boiling (for example, liquid products can be concentrated from 5% dry solids to 72%, or even higher, depending on the viscosity of the concentrates) ○ evaporation is used to pre-concentrate food, to increase the solid content of food, to change the colour of food and to reduce the water content of a liquid product almost completely	

Food technology	
K1.56 How heat processing techniques may change food and drink: • colour (for example, caramelisation) • texture (for example, coagulation, gelatinisation) • flavour • nutritional value • enzyme functionality • microbial growth, spore formation and survival which impacts on shelf life of food **K1.57 The difference between a range of heat-removal based food technology used within the food and drink industry:** • pellet freezing: o involves freezing liquids and semi-solids into pellet form o commonly used for spinach, cream, orange juice, eggs and soups • plate freezing: o used for food packed in flat cartons, such as ready meals o cartons are placed in between narrow metal shelves in which a very cold refrigerant circulates to ensure freezing o revolving plate freezers are used; for example, for boil-in-the-bag products o plate freezing usually takes 2 to 3 hours • blast freezing: o air blast freezers are the most common methods used for blast freezing and include: ▪ static tunnels, where trolleys of boxed products such as beef and cakes are pushed through	

Food technology	
▪ solid continuous belt freezers, which are used for fish fillets, burgers and pizzas ▪ spiral belt freezers, which are relatively small and allow the refrigerated air to pass through the open belt o air circulates around the food at temperatures of -30˚C to -40˚C o freezing time depends on the dimensions of the product but normally takes between 2 to 3 hours • nitrogen freezing: o is a rapid freezing technique where the food is sprayed with, or dipped into, liquid nitrogen o normally used for high-cost, small products such as prawns or raspberries • chilling: o food is portioned and chilled to below 3˚C within 2 hours of cooking o chillers must be capable of reducing the temperature of a 50mm layer of food from 70˚C to 3˚C in under 90 minutes when fully loaded o automatic controls are required including an accurate (0.5˚C) indicating thermometer and recorder o product depth may need to be reduced to achieve the chilling specification o joints of meats should not exceed 2kg and 100mm in thickness • blast chill: o cools food rapidly without freezing o chilled air at 2˚C to -7˚C is circulated around the product	

Food technology	
○ some blast chillers may also use liquid nitrogen and solid carbon dioxide **K1.58 Why heat-removal based food technology is used within the food and drink industry:** • to prevent the growth and multiplication of microorganisms • to keep food out of the danger zone (for example, between 5^0C - 63^0C) • to achieve a specific processing requirement **K1.59 The difference between a range of ambient temperature processing technologies:** • fermentation: ○ the process of converting carbohydrates to alcohol or organic acids using microorganisms (yeasts or bacteria) under anaerobic conditions ○ usually used for the chemical conversion of sugars into ethanol to produce alcoholic drinks such as wine, beer and cider ○ a similar process takes place in the leavening of bread (CO_2 produced by yeast activity) and in the preservation of sour foods with the production of lactic acid such as in sauerkraut and yogurts ○ other fermented foods include vinegar, olives and cheese • irradiation: ○ used to kill bacteria that cause food poisoning such as Salmonella spp., Campylobacter spp. and Escherichia coli ○ also helps to preserve food and extend shelf life ○ during irradiation food is exposed to electron beams, X-rays or gamma rays	

Food technology	
○ the effect is similar to pasteurisation or cooking but the appearance and texture of the food changes less during irradiation • chemical preservation methods: ○ chemical preservatives commonly used in food include benzoates (for example, sodium benzoate), nitrates (for example, sodium nitrate), sulphites (for example, sulphur dioxide) ○ these chemicals either inhibit the activity of the bacteria or destroy them; sorbic acid is also used for the same purpose **K1.60 Why ambient temperature processing is used within the food and drink industry:** • to control pH levels and water activity • to retain nutritional quality and sensory characteristics of food • to prevent the growth and multiplication of microorganisms **K1.61 The advantages, limitations and uses of the following different types of packaging used in the food and drink industry:** • aseptic processing (for example, Tetra Pack): aseptic processing is a high-temperature, short-time thermal process to commercially sterilise a product and fill the cooled sterile product into a pre-sterilised package, all within a sterile environment ○ advantages: ▪ aseptic technology keeps food safe and flavourful for at least 6 months, without refrigeration or preservatives ▪ extends the storage life of food products, optimising product quality and reducing cost	

Food technology	
▪ allows food to retain more colour, texture, taste and nutrients ○ limitations: ▪ requires sterilisation ▪ more expensive than other types of packaging as the materials require different machinery and can be complex ▪ maintaining air sterility in the processing room can be difficult ▪ only low-viscosity liquids can be processed using steam injection, and high-quality steam is required to ensure sterilisation ▪ dairy products could have a cooked flavour because of exposure to sulfhydryl groups and could change in colour, an effect caused by Maillard browning ○ uses: ▪ milk ▪ fruit juice ▪ salad dressing ▪ liquid egg • modified atmosphere packaging (MAP): uses gases such as carbon dioxide, nitrogen and oxygen, which are set at appropriate concentrations for the product. A mixture of the right type of gases is injected during sealing. Products must be stored in a refrigerated environment to maintain quality, food safety and shelf life ○ advantages: ▪ the atmosphere in which the food is packaged is modified so that spoilage is markedly reduced, and the shelf life	

Food technology	
of the product is increased, without the need of additives ○ limitations: ▪ risk of oxidation (for example, in the red colour pigments in red meat, especially prominent in beef) ▪ loss of colour in the food product can result in an unappetising appearance ▪ a low oxygen content in protective gas packaging may result in oxidation ▪ seal integrity is vital to ensure carefully selected proportion of MAP gases do not escape, which has an impact on the quality and safety of the product ○ uses: ▪ beef ▪ pork ▪ chicken ▪ fish (cooked or fresh) • canning: various types of hermetically sealed containers can be used for canning, including cans, restorable plastic trays, and pouches. Use of the term ‘canning’ applies to all of these: ○ advantages: ▪ canning alters the food chemically, by changing the moisture, pH or salinity levels to protect it against bacteria, moulds and yeasts ▪ canning also limits food enzyme activity ○ limitations: ▪ canning is time-consuming ▪ improper methods can be dangerous	

Food technology	
▪ when jars fail to seal, spoilage will occur ▪ inadequate processing or poor sanitation can result in Clostridium botulinum contamination ○ uses: ▪ canned fish, meats and vegetables • trays/bags/boxes/cartons: paper or plastic trays, bags, boxes or cartons ○ advantages: ▪ protects fragile products which are easily broken or damaged such as eggs, fruit or cakes ▪ can hold multiple items together such as bagged fruit, multi-can packs ○ limitations: ▪ large amounts of waste which is not always recyclable ○ uses: ▪ used to pack multiple items such as eggs in trays and multipack products • flexible packaging: shape of the packaging can be easily changed; this includes bags, pouches, shrink films, tubes, sleeves and carded packaging ○ advantages: ▪ lightweight bags or pouches which can be modified or customised with ease ▪ the packaging life will exceed the product shelf life ▪ it will remain functional until consumption ▪ barrier properties prevent product change	

Food technology	
▪ maintains food safety and preserves product quality ▪ shape can match the product and/or function o limitations: ▪ chemical release from packaging into food may occur (mass transfer migration) o uses: ▪ leafy vegetables ▪ frozen vegetables ▪ frozen flash-fried meat products **K1.62 The advantages, limitations and uses of the following packing techniques used in the food and drink industry:** • engineered packing: o advantages: ▪ depending on the type of automation and the number of products to be packaged, this can increase productivity time and ensure a faster production line o limitations: ▪ requires engineering know-how ▪ susceptible to breakdowns and downtimes ▪ requires expertise ▪ increased foreign body contaminant risk o uses: ▪ wide range of uses across food manufacturing, for example, leafy salad packaging lines	

Food technology	
▪ sophisticated and self-learning automated packaging and sorting units • hand packing: o advantages: ▪ suitable for products with greater variables, such as size or shape ▪ used for more specialised (for example, handmade, handpicked) food products or food products with greater fragility (for example, sandwiches) o limitations: ▪ lower productivity; focus on quality rather than production volumes o uses: ▪ sandwiches, certain fruits (for example, mangoes) **K1.63 The information included on packaging for pre-packed and non-pre-packed products:** • name of food • list of ingredients (including alcohol and strength) • allergen information (in bold) • quantity of ingredients • weight • use by, best before and display until dates • origin of raw materials (where origin is claimed) • origin of product • nutritional information • specialist storage conditions • specific instructions for use (for example, cooking times, mixing instructions)	

Food technology	
• additional information that must be obvious to consumers (for example, packed in a protective atmosphere, contains raw milk) • position of labels on product (for example, front of pack, back of pack, side of pack) • contact address of the seller (for example, retailer, farm, brand)	
Food supply chain from end to end and relationships within it	
The student must understand: **K1.64 How food fraud could occur within the food supply chain:** • adulteration • substitution • illegal processing • waste diversion • falsifying documentation **K1.65 Where, within the food supply chain, food fraud could occur:** • suppliers • during transportation • manufacturing plant • during storage • at point of sale **K1.66 Why food fraud may occur within the food supply chain:** • criminal activity (for example, by manufacturer, consumer) • profit (for example, by manufacturer, consumer)	The student must be able to: **S1.93 Assess, using VACCP, when food adulteration could be taking place:** • how it has occurred (for example, adulteration) • where, within the food supply chain it has occurred (for example, suppliers) • why it has occurred (for example, criminal activity) • who to escalate the issue to (for example, local concerns would be escalated to the police; global and national concerns would be escalated to the FSA)

Food technology	
• increased demand (for example, by manufacturers) • shortages of product and/or ingredients (for example, by suppliers) **K1.67 How VACCP can be used for the systematic prevention of any adulteration of food, particularly in relation to economically motivated adulteration:** • by identifying possible areas of weaknesses and, therefore, implementing additional checks to reduce likelihood of occurrence **K1.68 Food and drink organisations' responsibilities in confirming the traceability of products, one step forward and one step back, within the food supply chain:** • provide batch numbers • documented systems in place for traceability • record-keeping **K1.69 Food and drink organisations' responsibilities in confirming the quality of products within the food supply chain:** • quality assurance procedures • quality control procedures • certificate of conformance/analysis **K1.70 Food and drink organisations' responsibilities in highlighting potential concerns within the food supply chain:** • recall procedures • crisis management procedures • escalation process: ○ notify external agencies when appropriate: ▪ local concerns must be escalated to the police	

Food technology	
▪ global and national concerns must be escalated to the FSA	

Performance outcome 2: Develop new food and food related products to support the food supply chain

Product development process	
Knowledge - What you need to teach	**Skills - What you need to teach**
The student must understand: **K2.1 The stages and principles of the product development process, from concept to launch:** • product brief: o what the product is o why it is being developed o intended market o specific info about the product (for example, raw/cooked/ready to eat/ready to cook/starter/main/dessert) o total weight of final product o cost to sell to consumer • idea generation: o research and development on trends o innovation o viability • review meeting (for example, with sales, customer service, promotions departments) to discuss: o initial idea o viability of product o margins and profitability o cost (for example, production, raw materials, packaging, staff) • feasibility study: o legal checks o production (for example, pilot plant or scaled factory production)	The student must be able to: **S2.26 Perform an impact assessment of consumer trends on the design of both a new product development and an existing product development:** • using different sources of information to gather evidence • reading, understanding and synthesising the information for the intended purpose, taking into consideration any potential bias • presenting the information to suit audience and purpose in an appropriate format (for example, presentation, written report, graphs, tables), ensuring the information is organised logically and coherently • consumer trends: o health (for example, low fat, high protein, vegan) o environmental (for example, palm oil) o ethical (for example, fair trade) o economic factors (for example, low cost) o influence of media and peers (for example, celebrity endorsement, social media) (GEC2, GEC5, GMC6)

Product development process	
○ technical (for example, food safety) ○ procurement ○ planning ○ resource ○ raw materials ○ sales/marketing ○ engineering ○ process development • customer (for example, retailer) review of product: ○ taste panel (for example, colour/texture/viscosity/consistency) ○ discuss costs ○ suitable alternatives (for example, to ingredients or packaging) • concept approval and handover to production: ○ labelling ○ total weight of product ○ total ingredients for the trial run ○ breakdown of costings at each stage ○ packaging, including format and artwork ○ allergens in product ○ raw material specification (for example, raw materials, ingredients by weight, process, image of product, image of packaging) • trial run of product: ○ ingredient procurement ○ process development ○ label sign-off, including nutritional information, allergens and shelf life of food	

Product development process	
○ confirming costings are accurate ○ required standard operating procedures (SOPs) created (for example, mixing, sieving, cooking, allergen and integrity controls) ○ Hazard Analysis and Critical Control Points (HACCP) flow ○ supplier approval ○ undertake nutritional analysis ○ primary packaging sealing and closure testing ○ secondary packaging review - physical fit and text review ○ identify number of trials required to ensure product meets requirements ○ potential external testing to confirm product is well received/fit for purpose ○ customer (retailer or brand) approval • review trial of product: ○ variables (for example, cooking times, HACCP flow, production environment, required additional skills and training) ○ yields (for example, issues with raw materials and packaging, volume, cooking process, batch sizes) • pre-production: ○ to confirm process • launch product: ○ marketing to end point consumers ○ taste panels of end point consumers • post launch review of product: ○ rate of sell, rate of waste in store ○ customer (for example, retailer) feedback ○ complaints	

Product development process	
○ issues from taste panels ○ microbiology testing and results ○ issues with production of raw materials ○ any changes required **K2.2 Why an existing product may need to be changed:** • cost • improve sales • scarcity of raw materials • customer request • change of packaging • change in the law • improve quality • issue with food safety **K2.3 How the process for changing an existing product would differ to that of a new product development process:** • reduction in number of stages (for example, may not include feasibility study or taste panels) **K2.4 Different consumer trends which may drive the design of a new product:** • health (for example, low fat, high protein, vegan) • environmental (for example, palm oil) • ethical (for example, fair trade) • economic factors (for example, low cost) • influence of media and peers (for example, celebrity endorsement, social media) **K2.5 How impact assessments are used to investigate the viability of a new product:** • costs of people, process, equipment, raw materials, packaging	

Product development process	
• feasibility of production • brand reputation	

Advanced recipe formulation	
The student must understand: **K2.6 The first principles of recipe balance:** • proportionality: ratio of each individual ingredient within a recipe • nutrient balance: ensuring the correct nutrients are included, dependent upon the consumer requirements (for example, low sugar, high protein) • organoleptic properties: ensuring acceptable colour, taste, odour, texture, dependent on customer specification • ingredient substitution where appropriate: the substitution of ingredients, dependent upon the functionality and cost of the product **K2.7 Why ingredients may need to be substituted:** • seasonality • environmental • media influence • allergenic • cost • availability • religion/culture • organoleptic properties **K2.8 How the functionality of ingredients can be used to enhance a recipe:**	The student must be able to: **S2.27 Formulate a recipe from first principles, taking into consideration the customer requirements for:** • proportionality of ingredients • nutrient balance (for example, requirement for high protein) • organoleptic properties (for example, requirement for low salt) • ingredient substitution (for example, requirement for gluten free) (GMC3) **S2.28 Enhance an existing recipe, selecting the correct ingredients based on their functionality, to improve the flavour of the product:** • taste: o sweet (for example, sucrose, fructose, glucose, maltose, dextrose) o sour (for example, citric, acetic, lactic, malic and tartaric acid) o salt (for example, sodium chloride, potassium chloride) o bitter (for example, quinine sulphate, caffeine) o umami (for example, monosodium glutamate (MSG))

Advanced recipe formulation	
• emulsifiers: makes 2 incompatible components compatible, such as water and oil (for example, lecithin) • raising agents: causes expansion by release of gases (for example, yeast) • stabilisers: preserves structure (for example, gelatin) • flavourings/seasoning: used to enhance taste (for example, spices, salt) • preservatives: used to reduce available water and enhance shelf life (for example, sugar, salt, potassium sorbate) • colour enhancers: used to enhance organoleptic properties (for example, caramel, beetroot powder) • firming agents: strengthens the structure of food to keep firm or crisp (for example, calcium chloride) • sweeteners: used to reduce sugar content (for example, aspartame) • anti-caking agents: used to stop powdered or granulated foods sticking together (for example, silicon dioxide) • foaming agents: helps make foam by dispersing a gas in a liquid or solid (for example, quillaia extract) **K2.9 The reasons for selecting ingredients for specific applications.** • reasons for selecting ingredients: ○ functionality ○ physical properties of the ingredient (for example, whether it can withstand the processing requirements) ○ suitability for specific applications • specific applications: ○ age of consumer	• aroma: ○ odour of food which can be affected by mastication and air intake (for example, fruit flavours) • trigeminal response: ○ burning (for example, mustard, chilli, horseradish) ○ cooling (for example, mint, menthol) ○ tingling (for example, citric, acidic) **S2.29 Develop a new food product to meet customer requirements, taking into account:** • the suitability of all raw materials • substituting raw materials, dependent on consumer need and seasonality

Advanced recipe formulation	
○ nutritional requirements (for example, increase protein, low fat) ○ allergenic (for example, free-from) ○ social/religion/culture/lifestyle (for example, vegetarian) **K2.10 A range of raw material alternatives that can be used when formulating a recipe:** • soya protein instead of meat protein • sweeteners instead of sugar • vegetable fats instead of animal fats • cashew/almond milk instead of dairy	

Packaging innovation	
The student must understand: **K2.11 A range of packaging innovations used to reduce plastic waste/increase opportunities for recycling:** • use of innovative materials (for example, bamboo) • package free (for example, fill your own containers) • compostable packaging (for example, made from plant-based materials) • single-layer packaging	The student must be able to: **S2.30 Recommend packaging when developing a new food product, considering innovations in packaging, to reduce plastic waste and increase opportunities for recycling.**

Costing the production of products	
The student must understand: **K2.12 How individual costs of different components contribute to the overall product cost:**	The student must be able to: **S2.31 Carry out a product costing on a new product and on a modification to an existing product, by:**

Costing the production of products	
• premium ingredients versus cheaper substitutions (for example, sicilian lemons versus non-sicilian lemons) • handmade versus machine produced (for example, labour-intensive versus automated) • low volume versus high volume (for example, small batches versus mass-produced) • types of packaging (for example, boxed versus unboxed) • recyclable waste versus non-recyclable waste (for example, collecting excess dusting flour and reusing for other dusting) **K2.13 How to calculate total production run costs:** • raw material cost (recipe ingredients and packaging x number of products) • labour cost (number of people x hourly rate x number of hours) • utility costs (hourly rate x number of hours) • equipment (hourly rate x number of hours) • distribution and transportation costs (batch size and number of vehicles required)	• calculating individual component costs and production run costs to give a total cost: ○ individual component costs: ▪ ingredients ▪ process ▪ batch size ▪ packaging ▪ re-use of waste ○ production run costs: ▪ raw material costs ▪ labour costs ▪ utility costs ▪ equipment ▪ distribution and transportation costs • undertaking cost-comparison in order to reduce costs where appropriate (for example, premium ingredients versus cheaper substitutions) (GMC9)

Sustainability	
The student must understand: **K2.14 The importance of procuring raw materials from sustainable sources (for example, sustainable palm oil):** • to ensure traceability of the raw materials • to minimise harm to the environment • to maintain reputation and integrity	The student must be able to: **S2.32 Carry out a sustainability analysis on a new product, by identifying the social, environmental and economic implications of the:** • raw materials • packaging • reuse of waste

Sustainability	
• to demonstrate accreditation of particular raw materials/ingredients (for example, Marine Stewardship Council, Roundtable on Sustainable Palm Oil (RSPO)) **K2.15 Ways in which the use of plastic (particularly black plastic) can be reduced in the packaging of food and drink, whilst ensuring the packaging remains fit for purpose:** • reducing plastics wherever possible: o boxes instead of bottles o paper bags instead of plastic • re-use plastics wherever possible: o re-useable bags and containers • recycle plastics wherever possible: o use recyclable plastics polyethylene terephthalate (PET) o high-density polyethylene (HDPE) o plastics with On-Pack Recycling Label (OPRL) **K2.16 Ways in which to re-use waste:** • composting • anaerobic digestion • food waste recycling • biomass products • thermal treatment with energy recovery **K2.17 Ways in which to reduce energy usage when developing a new product:** • use of energy efficient equipment (for example, insulated refrigeration) • efficient use of existing equipment and resources (for example, turning down thermostats, use of LED light bulbs)	• energy usage • transportation • social, environmental and economic impact may include: o use of natural resources and stewardship of natural resource global and local o energy efficiency and use of natural resource/recycling o business ethics, fair trade, human rights and employment rights **S2.33 Present information on a sustainability analysis of a new product (for example, using a presentation, written report, graphs, tables):** • summarising information concisely • selecting fact from opinion • using technical terms where appropriate • organising information logically and coherently • using appropriate grammar • listening actively, recording information accurately and concisely, and requesting clarification where appropriate (for example, requesting additional information from support functions/specialists such as the maintenance team regarding energy usage) • responding to questions/feedback from colleagues/customers (GEC2, GEC4)

Sustainability	
• good manufacturing processes (for example, keeping areas clean and minimising movement/transportation) **K2.18 How to reduce the effect of transportation on the environment:** • consider type of fuel used for transport • change from ‘food miles’ to ‘green food miles’ • minimise packaging and containers • consider transport method (for example, aerodynamic vehicles, rail versus road)	

Continuous improvement (CI) management in the food industry	
The student must understand: **K2.19 How to use workplace organisational techniques for continuous improvement:** • lean approach: o determining value (for example, establishing who the customer is and their exact requirements) o map the value stream (for example, the activities or processes required to deliver the product to the customer) o enable the flow (for example, eliminate queuing and waiting times) o pull (for example, pulling the product through to the customer as and when they need it) o seek perfection (for example, embedding new ways of working and improve customer experience) • the Deming cycle: o plan	The student must be able to: **S2.34 Contribute to continuous improvement to drive down costs and drive up quality by following the Deming cycle:** • plan: o identify where improvements may be made, using IT systems to analyse and interpret data to identify trends (for example, volumes, run times) o identify key stakeholders to gain agreement on proposed changes (internal or external) • do: o apply the lean approach to implement identified improvements • check: o use IT systems to analyse and interpret data to measure effectiveness of implemented improvements • act:

Continuous improvement (CI) management in the food industry	
○ do ○ check ○ act • 5Ss: ○ sort: keeping what you need and getting rid of what you do not ○ set in order: having a place for everything and everything in its place ○ shine: keeping everything clean ○ standardise: everything is the same (for example, use of colour coding) ○ sustain: maintaining a consistent standard **K2.20 Ways to maximise equipment efficiency:** • using equipment at optimum speed (for example, overall equipment efficiency) • reducing stoppage time (for example, single-minute exchange of dies) • reviewing what has gone wrong to reduce future failure (for example, failure mode and effect analysis) **K2.21 The considerations of process limitations (for example, bottlenecks):** • ensuring consistent quality of product (for example, if machine is not being used at optimum speed it may affect output) • batch size • machine capacity and capability • resources (for example, labour, raw materials) • environment (for example, other processes that may affect each other) • production planning	○ recommend improvements and agree with key stakeholders (for example, improvements to the product, process, people management) ○ use IT systems to demonstrate before and after results ○ review results to maintain improvements (GMC5, GDC4)

Continuous improvement (CI) management in the food industry	

K2.22 How to manage the 8 types of waste within a food and drink manufacturing process:
• transportation:
  ○ reducing transportation both external (from supplier) and internal (within manufacturing plant)
• inventory:
  ○ minimising the amount of raw materials on-site
• motion:
  ○ minimising the amount of movement within the production facility
• waiting:
  ○ reducing the time that is spent between each stage in the process
• over-production:
  ○ avoiding making more than is required
• over-processing:
  ○ avoiding adding unnecessary value, finished products that are over or under weight
• defects:
  ○ avoiding mistakes through effective quality assurance, quality rejections, machinery breakdowns
• skills:
  ○ ensuring staff are trained appropriately for their role
K2.23 The relationship between the drivers for cost and quality and improving value:
• drivers for cost and quality:
  ○ increased productivity
  ○ improved quality
  ○ lowered costs	

Continuous improvement (CI) management in the food industry	
○ decreased delivery times ○ improved staff morale ○ understanding the market and competitors ○ understanding internal and external failure costs ○ continuous review of business requirements • improving value: ○ value-creating (for example, improve or increase) ○ non-value-creating but necessary (for example, reduce) ○ pure waste (for example, eliminate)	

Selecting a suitable sampling method	
The student must understand: **K2.24 How the sample size, sample numbers per batch and frequency of sampling are determined for the procedural requirements:** • type of product (high risk/low risk) • type of process (high care/low care) • volume of product • any known associated risks with the product	The student must be able to: **S2.35 Follow procedural requirements to collect samples, including:** • collecting the correct sample size • collecting the correct numbers per batch • collecting the sample at the correct frequency

Selecting a suitable test method	
The student must understand: **K2.25 The purpose of different test methods that can be used to test new food products**	The student must be able to:

Selecting a suitable test method	

and/or identify and resolve issues in the food supply chain:
• ensure compliance with product specification:
  ○ nutritional analysis meets requirements
  ○ taste/sensory panels; comparing against customer quality assurance sheets, including types and quantity of raw materials; photographic representation of plated, finished product and sample of approved packaging
• ensure product quality:
  ○ taste/sensory panels, through the use of organoleptic and physiological testing
• ensure product safety:
  ○ microbiological
  ○ food allergen testing
  ○ food contaminant testing
	S2.36 Select a suitable test method, depending on the purpose of the test:
	• compliance
	• product quality
	• product safety
	S2.37 Analyse test results to confirm nutritional requirements and ensure product safety:
	• quantitative results (for example, presence/absence and type of pathogens (causative agents), allergens or contaminants)
	• qualitative results (for example, numbers of pathogens (causative agents) present or percentage of nutrients)

Performance outcome 3: Identify and resolve issues in the food supply chain

Technical and quality solving problems in the food supply chain	
Knowledge - What you need to teach	**Skills - What you need to teach**
The student must understand: **K3.1 The purpose of using problem solving techniques (for example, root cause analysis) when investigating and resolving problems within the food and drink industry:** • to identify the cause, rather than the symptoms, of the problem • to generate possible solutions • to evaluate and identify the most appropriate solution • to fully resolve and prevent reoccurrence **K3.2 The importance of identifying and resolving problems relating to customer complaints and quality issues:** • prevents re-work • reduces waste • maintains brand reputation • reduces customer complaints • increases customer satisfaction	The student must be able to: **S3.8 Identify and resolve problems relating to quality issues and/or customer complaints using appropriate problem-solving techniques:** • receiving feedback and evidence from customer • establishing if complaint is valid • identifying the batch • reviewing taste panel results: o identifying if it is a one-off incident or whether it affects a whole batch o considering the risks associated with the incident o considering whether the batch needs to be recalled • reviewing retained samples of the same batch against complaint • sharing results of investigation, including proposed solution **S3.9 Apply the 8 stages of root cause analysis to investigate problems and/or customer complaint and recommend suggestions for improvement:** • stage 1: defining the incident through the use of open questions to ensure a thorough understanding of the problem/customer complaint • stage 2: identifying initial corrective action to contain and address the immediate consequences • stage 3: categorising the incident by drawing up a fish bone diagram, focusing on

Technical and quality solving problems in the food supply chain	
	the key factors that need to be taken into account, including packaging, ingredients, process, procedures, people • stage 4: determining the root causes by utilising the 5 whys (for example, risks, probabilities and other factors) • stage 5: identifying management procedures that have failed • stage 6: defining preventative actions and implementing solutions to resolve problem/customer complaint • stage 7: reviewing effectiveness of preventative actions, including validity of the solution • stage 8: sustaining and maintaining improvements, sharing outcomes and best practice where appropriate (GMC10)

Testing and evaluation in the food supply chain	
The student must understand: **K3.3 The principles of sensory evaluation used in food operations:** • using the 5 senses (sight, odour, taste, texture, sound) to evaluate the quality of the product to ensure it meets the specification • to gain qualitative and quantitative data to maintain the consistency of product quality **K3.4 How to carry out sensory evaluation:** • at specified times • controlled by trained staff • using screened participants	The student must be able to: **S3.10 Carry out procedures for quality control testing and sensory analysis:** • step 1: screening all taste panel participants to check for: o colour blindness o ability to taste salt, sweet, sour, bitter, umami o ability to describe a product objectively o ability to detect odour • step 2: ensuring facilities and resources are appropriate: o separated, designated tasting area

Testing and evaluation in the food supply chain	
K3.5 How to determine the sampling required as part of the sensory analysis panels: • batch size • specification requirements • outcomes of previous panels **K3.6 How different procedures are used to measure quality control and sensory analysis in food operations:** • following customer specifications: o following pack instructions (for example, cooking or mixing) to ensure customer requirements are met o checking visible ingredients o checking finished product against photo image o checking packaging against photo image • on-line tasting (for example, on the production line): o checking that the flavour, aroma and texture meets customer specifications • finished product tasting: o carrying out a formal taste panel with screened participants **K3.7 The importance of maintaining specifications when carrying out sensory evaluation in food operations:** • to ensure updates are factored into evaluation • to avoid traceability issues (for example, taste panel participant has an allergic reaction)	o minimal décor o neutral work surfaces o well lit o good ventilation o access to bottled or filtered water and palate cleansers o access to white crockery, clear glasses, white plastic cutlery o adequate cooking sample preparation facilities o copies of the product specification available o questionnaires to record results **S3.11 Carry out a taste panel and evaluate results:** • step 3: leading the taste panel: o ensuring sample is in place prior to participants' arrival o clarifying the process and responding to any questions that arise o ensuring participants do not influence each other's opinion o ensuring there is no communication during the taste panel o ensuring all participants are facing away from each other o ensuring participants undertake the tasting and grading of the product • step 4: collect, collate and analyse data from the taste panels using digital devices and applications: o ensure all participant data is considered o ensure the product is graded (for example, red, amber, green or numerical values)

Testing and evaluation in the food supply chain	
	○ make recommendations based on analysis of trends (GEC6, GDC1)

Performance outcome 4: Collect, analyse and interpret food production data

Food production data	
Knowledge - What you need to teach	**Skills - What you need to teach**
The student must understand: **K4.1 Where to collect food production data from in relation to:** • food safety: o Hazard Analysis and Critical Control Points (HACCP) records o cleaning records (for example, good hygiene practices (GHP) o product recalls/withdrawals o customer complaints o consumer complaints o audit results (for example, good manufacturing practice (GMP), supplier assurance, external) o risk assessments (for example, vulnerability, traceability, allergen, integrity) o laboratory testing (for example, microbiology, allergen and nutritional) • food quality: o taste panels o audit results (for example, GMP, supplier assurance, external) o customer feedback (for example, customer complaints or compliments) o risk assessments (for example, vulnerability, traceability, allergen, integrity) o cleaning records (for example, GHP) • customer requirements: o trend analysis	The student must be able to: **S4.6 Create a spreadsheet to track production trends.** **S4.7 Input management data to track production trends, demonstrating digital critical literacy by ensuring confidentiality processes are followed to ensure safety, security and privacy (for example, when using screens to input data).** (GDC4, GDC5, GMC5) **S4.8 Systematically organise data in order to track production trends.** (GDC4 GMC5) **S4.9 Critically interpret the data, considering process and scale, and any out of tolerance results that breach the critical limits.** (GMC1, GMC6) **S4.10 Present information:** • in a written and visual format and/or presentation (for example, in a variety of texts) • in a clear and unambiguous way • using technical language correctly • using mathematical processes to support technical arguments (for example, deviation from acceptable microbiology results) • using images and other tools (for example, graphs as appropriate) • organising information logically and coherently

Food production data	
○ changes to specifications ○ customer feedback **K4.2 How to interpret and analyse food production data:** • identifying out-of-tolerance results in relation to process and scale • identifying trends • identifying root cause • identifying corrective actions required • providing recommended preventative actions **K4.3 How different applications, including spreadsheets, databases and data loggers, can be used to support the interpretation and analysis of food production data:** • storage of large amounts of data, over long periods of time • organisation of data • presentation of data **K4.4 Why electronic resource planning systems (management information system) are used within the food and drink industry:** • to support all business transactions within the food production facility by providing a central integrated system • to store different types of data (for example, supplier information, quantity of raw material, specification requirements, batch numbers) • to retrieve food production data (for example, sales and trends, test analysis results) **K4.5 How trends in food production data can be used for continuous improvement within the food and drinks industry:**	• proofreading information to ensure appropriate use of grammar, vocabulary, spelling and punctuation (GEC1, GEC2, GEC3, GMC6, GMC8)

Food production data	
• to make improvements to product (for example, making the nutritional value of the product healthier such as sugar or salt reduction or reducing the yeast levels in a product by perfecting the cooking process to reduce micro-organisms to a safe level, while preserving quality) • to make improvements to processes (for example, meeting exact weight tolerances to improve consistency of filling weight) • to make improvements to people management (for example, utilising skills to maintain quality and safety levels) • to make improvements to packaging (for example, improving the seal integrity of a piece of packaging) • to make improvements to raw materials (for example, using cheaper raw materials whilst maintaining recipe functionality) • to make cost savings • to identify training needs and skills gaps • to make changes within the supply chain (for example, shortening the route to market and improving the product shelf life)	

Occupational specialism - technical: metrology sciences

Knowledge and skills are set out side-by-side within their themed sections. The numbering is sequential throughout the performance outcome, from the first knowledge statement, following on through the skills statements. The ‘K’ and ‘S’ indicate whether the statement belongs to knowledge or skills.

Mandatory content:

- **Performance outcome 1:** Plan appropriate scientific measurement for any measurand to comply with regulatory requirements
- **Performance outcome 2:** Perform scientific measurement tasks using the most appropriate measurement for a measurand to ensure accuracy
- **Performance outcome 3:** Collect, analyse and interpret data from measurement tasks
- **Performance outcome 4:** Identify and resolve issues with measurement tools and equipment

Glossary

Equipment standard

A comparison object with a stated quantity value and an associated uncertainty of measurement.

Measurand

The quantity that is intended to be measured.

Written standard

A document which prescribes procedures, practices and maximum permissible errors or best practice advice for users.

Reference material/standard

Is characterised by a metrologically valid procedure for one or more specified properties, which may be accompanied by a certificate that provides the value of the specified property, its associated uncertainty, and a statement of metrological traceability.

Conformity assessment

Any activity undertaken to determine, directly or indirectly, whether a product, process, system, person or body meets relevant standards and fulfils specified requirements.

Performance outcome 1: Plan appropriate scientific measurement for any measurand to comply with regulatory requirements

Fundamentals of metrology	
Knowledge - What you need to teach	**Skills - What you need to teach**
The student must understand: **K1.1 The concept of measurement:** • obtaining quantitative data that describes a property of an object or event (for example, how heavy an object is) • measurements are made using an instrument/device (for example, a ruler, thermometer) • results are normally expressed as a number and a unit to allow for traceable comparison (for example, 2 metres) **K1.2 How metrology is defined:** • the science of measurement and its application **K1.3 The importance of metrology to society and everyday life (for example, industry and trade, science and innovation, quality of life):** • provides traceability of measurements • allows fair competition in the marketplace • gives a level playing field in the pricing of goods and commodities • helps business make informed data-driven decisions **K1.4 The definition of measurement standards:** • reference materials/standards or measuring systems, against which all other measurements are compared **K1.5 The use of measurement standards in the calibration of measuring equipment when planning scientific measurements:**	The student must be able to: **S1.48 Make informed decisions about the needs of the measurement task:** • purpose: o the purpose of the measurement task • measurement process cost: o is an in-house measurement sufficient? • tolerance: o which standard of measurement or calibration is applicable? • timescales: o the more accurate the measurement or calibration, the longer the measurement takes **S1.49 Determine the design of the measurement, taking into account:** • appropriate sampling strategy • number of repeated measured values • operators involved • components and/or features to be inspected **S1.50 Read a simple uncertainty budget for a measurement task and use it to:** • identify the most significant sources of uncertainty • suggest improvements to the measurement plan **S1.51 Use the correct terminology for measurement in metrology:** • measurement uncertainty

Fundamentals of metrology	
• primary standards as the realisation of the international system of units (SI) • secondary standards as calibrated against primary standards • working standards as references used to calibrate end user equipment **K1.6 How the accuracy of measurements is related to:** • tolerance: the tighter the tolerance specified on a measurement, the more accurate the measurement needs to be • cost and timescales (fitness for purpose): more accurate measurement may involve increased cost and greater timescales, through the use of more complex instruments **K1.7 The concept and purpose of measurement uncertainty:** • concept: o the quantification of doubt in a measured value • purpose: o to identify how good/reliable a measurement is and if it is good enough to use o allows the comparison of measured values/reference values **K1.8 The different ways sources of uncertainty may be categorised:** • the measuring instrument • the item being measured • the measurement procedure • the skill of the operator • environmental effects • sample size and representative sample	• calibration • accuracy • measurement error • precision • repeatability • reproducibility • resolution • sensitivity • maximum permissible error (MPE) • measurand • measurement standard • bias **S1.52 Use different unit systems (SI and non-SI units) and be able to convert between units, using appropriate conversion factors or formulae:** • converting between units within the SI • converting between SI and non-SI units (GMC4)

Fundamentals of metrology	
• calibration uncertainty **K1.9 The difference between repeatability and reproducibility of measurement results:** • repeatability of measurements refers to repeat measurements made on the same instrument/device under identical conditions (for example, by the same operator) • reproducibility refers to the variation in measurements made on a subject under different conditions (for example, by another operator, in different locations, with different instruments) **K1.10 The concept of Type A and Type B evaluations of uncertainty:** • Type A: based on a statistical approach • Type B: based not on statistical analysis of data, but on other forms of information **K1.11 The concept of random and systematic effects:** • random: component of measurement error that in replicate measurements varies in an unpredictable manner • systematic: component of measurement error that in replicate measurements remains constant or varies in a predictable manner **K1.12 How to mitigate for random and systematic effects (for example, using best practice for the measurement system to minimise uncertainty):** • random: can be mitigated by increasing the number of measurements and via averaging • systematic: can be mitigated by applying a correction/allowance (although there will be uncertainty associated with the correction applied)	

Fundamentals of metrology	
K1.13 The role of measurement uncertainty in conformity assessment: • provides a level of confidence in the stated result **K1.14 The concept of level of confidence using k = 1 (≈68%), k = 2 (≈95%) and k = 3 (≈99.7%):** • the coverage factor (k) is based on an assumption of a normal distribution of results • expanded uncertainty is determined by multiplying the measurement uncertainty by the coverage factor **K1.15 How an unbroken chain of comparisons, directly related to SI units, ensures confidence in results through:** • calibration (for example, comparison against a higher standard) • testing (for example, certified reference materials (CRMs)) • accreditation (for example, method and instrument validation) **K1.16 The links within a traceability chain:** • SI units (International Bureau of Weights and Measures, BIPM) • primary standards (National Measurement Institutes) • reference standards (accredited calibration labs) • working standards (in-house calibration labs) • measuring equipment (end users) **K1.17 Techniques for gaining confidence in measurement:** • verification tests: conformity of the instrument to legal, manufacturers', British, European or international standards	

Fundamentals of metrology	
• interim checks of equipment: to determine if the instrument is behaving as expected • field checks: to determine if the instrument or device is behaving as expected in a given location • measurement systems analysis: to confirm reliability of results • third-party assessment: to provide expertise or equipment if required by law or if it is unavailable **K1.18 The purpose of measurement instruments** • used for indicating, measuring and recording specific physical and chemical quantities (for example, ammeter to measure electrical current, ICP-MS to measure trace metals in river water by inductively coupled plasma mass spectrometry) **K1.19 The differences between automated and manual measuring instruments:** • automated: o time saving o used for manufacturing on a large scale o removing manual error • manual: o low cost o used for small volume of samples o portability of instruments and devices **K1.20 How to apply best practice principles in measurement:** • choosing the correct measurement for the property you are trying to measure (for example, tension or compression) • using appropriate equipment for the measurement task	

Fundamentals of metrology	
• ensuring operators are suitably skilled and trained • using suitable procedures, including standard operating procedures (SOPs) where appropriate • using a defensible sampling strategy • ensuring equipment is in good working order and fully calibrated • use of traceable reference materials/standards **K1.21 The purpose of an uncertainty budget:** • to calculate uncertainty of a measurement • to help plan and prioritise improvements to a measurement procedure **K1.22 The components of an uncertainty budget, used to calculate measurement uncertainty:** • source of uncertainty • uncertainty value • probability distribution: o normal o rectangular o triangular o u-shaped • divisor • standard uncertainty/standard deviation • sensitivity coefficient • contribution to combined standard uncertainty • combined standard uncertainty • expanded uncertainty **K1.23 Factors that may influence the number of repeated measurements in a measurement task:**	

Fundamentals of metrology	
• level of uncertainty • time available • cost • measurands that cannot be measured repeatedly • amount of available sample **K1.24 Factors that may influence the sampling strategy:** • time available • cost • quality of data • type of sample (for example, gas, liquid or solid) **K1.25 The difference between validation and verification of scientific measurement equipment:** • verification: to verify conformity of measurement equipment with specifications • validation: to determine if the measurement equipment is fit for use **K1.26 The correct terminology for measurement in metrology:** • measurement uncertainty: the quantification of doubt in a measured value • calibration: an action to determine the relationship between a displayed value of the measuring instrument against a traceable standard • accuracy: the closeness of agreement between a measured value and the true quantity value • measurement error: the difference between the measured value and the 'true value' of the measurand	

Fundamentals of metrology	
• true value: the result of a perfect measurement • precision: the closeness of agreement between measured values • repeatability: the degree of agreement in successive measurements undertaken under identical conditions • reproducibility: the degree of agreement in successive measurements undertaken under different conditions • resolution: the smallest difference that can be displayed on an instrument • sensitivity: the change of the display of a measuring instrument when a known input is applied • maximum permissible error (MPE): the largest deviation allowed (usually ±) from that prescribed for the instrument before action is needed • measurand: is the quantity that is intended to be measured • bias: statistically, the difference between the test results of a known reference value and the given reference value **K1.27 The impact of using incorrect terminology when communicating about measurement:** • inability to obtain the required measurement information • not meeting customer expectations • erosion of trust between the customer and the supplier • loss of reputation • time/cost of repeating measurements **K1.28 The sources which may be used to calculate maximum permissible error (MPE) of a system:**	

Fundamentals of metrology	
• standard • specifications • regulations **K1.29 The international system of units (SI), including:** • how the 7 SI base units are defined and realised: ○ metre ○ kilogram ○ second ○ ampere ○ kelvin ○ mole ○ candela • how combinations of the base units provide derived units (for example, area, volume and pascals) • how to use unit pre-fixes and their symbols correctly, including in unit conversions: ○ pico (10^{-12}) ○ nano (10^{-9}) ○ micro (10^{-6}) ○ milli (10^{-3}) ○ centi (10^{-2}) ○ deci (10^{-1}) ○ kilo (10^{3}) ○ mega (10^{6}) ◦ giga (10^{9}) ○ tera (10^{12}) • how conversion factors or formulae are used when converting within the SI:	

Fundamentals of metrology	
○ use of appropriate conversion factor or formulae • how conversion factors or formulae are used when converting between SI and non-SI units: ○ use of appropriate conversion factor or formulae for the non-SI unit, which gives you the value in SI	

Operating principles, equipment and tools	
Knowledge - What you need to teach	**Skills - What you need to teach**
The student must understand: **K1.30 The tools and equipment (and software programs where applicable) used within the following operating principles:** • length: ○ handheld dimensional measurement tools ○ coordinate measuring machine ○ laser tracker ○ articulated arm ○ global positioning system (GPS), photogrammetry, structured light scanner, laser line scanners ○ laser radar scanner ○ interferometer • temperature: ○ liquid-in-glass thermometers ○ resistance thermometers ○ thermistors ○ thermocouples	The student must be able to: **S1.53 Select appropriate tools/equipment/instrumentation (with any associated software) when planning for a specific measurement task, using:** • length • temperature • time • mechanical quantities • pressure • flow • electrical quantities • chemical analysis • microscopy • volume • mass

Operating principles, equipment and tools	
○ radiation thermometers ○ thermal imagers • time: ○ stopwatch ○ atomic clock • mechanical: ○ stress tester ○ hardness tester ○ torque driver ○ skidded and skidless surface probes • pressure (absolute, gauge and differential): ○ direct and indirect pressure measurement techniques • flow: ○ differential pressure flowmeters ○ mechanical flowmeters ○ vortex flowmeters ○ hydrometer (density for liquids) • electrical: ○ analogue and digital meters for measurement of voltage, current and resistance ○ bridge circuits ○ oscilloscopes ○ capacitor ○ resistor • chemical analysis: ○ pH meter ○ mass spectrometer (MS) ○ high performance liquid chromatograph (HPLC)	

Operating principles, equipment and tools	
○ infrared spectrometer (IR) • microscopy: ○ atomic force microscope ○ scanning electron microscope ○ confocal microscopy ○ focus variation • volume: ○ pipettes ○ burettes ○ volumetric flasks ○ measuring cylinders • mass: ○ weighing scales ○ balances (for example, top pan and analytical) **K1.31 The considerations when deciding on the most appropriate equipment and tools to be used:** • the size, type, toxicity and stability of the item being measured • the measuring environment (for example, humidity, temperature, dust) • skills required by the operator • cost of the equipment • the required accuracy of the measurement	

Measurement systems	
Knowledge - What you need to teach	**Skills - What you need to teach**
The student must understand:	The student must be able to:

Measurement systems	
K1.32 The advantages and limitations of different commercially available equipment and instrumentation used within the following operating principles: • length (for example, micrometer versus vernier calliper) • temperature (for example, liquid-in-glass versus thermistor) • mechanical (for example, hardness testers versus tensile testers) • time (for example, stopwatch versus digital timer) • pressure (absolute, gauge and differential) (for example, dial gauge versus deadweight tester) • flow (for example, ultrasonic meter versus positive displacement meter) • electrical (for example, multimeter versus oscilloscope) • chemical analysis (for example, mass spectrometer versus infrared spectrometer) • microscopy (for example, scanning electron microscope versus transmission electron microscope) • volume (for example, pipette versus measuring cylinder) • mass (for example, top pan versus analytical balance)	**S1.54 Provide reasoned decisions for the selection of equipment and instrumentation, taking into account the advantages and limitations.**

Different sample preparation methods	
Knowledge - What you need to teach	**Skills - What you need to teach**
The student must understand:	The student must be able to:

Different sample preparation methods	
K1.33 Why different sample preparation methods are required when preparing an item for measurement: • cleaning: to ensure the sample is adequately prepared for the measurement (for example, to remove surface contaminants) • normalisation (for example, soaking): to ensure the sample has enough time to reach ambient temperature before making the measurement • fixturing and clamping: to stop the work piece/test item moving during the measurement task • solution preparation: to ensure all liquids or other materials required for the scientific measurement are of the correct quantities and have the correct properties for the measurement to occur • staining: to enhance the sample and allow the visualisation of specific components under the microscope • sectioning: to provide a thin enough section of the sample to permit the required inspection under the microscope • mounting: to allow samples to be handled easily and orientated correctly, such that the required features can be inspected under a microscope • polishing: is used to create a flat, defect-free surface for examination of the sample's microstructure under a microscope • coating: to enable or improve the imaging of nonconductive samples or poorly conductive samples by electron microscopy	**S1.55 Plan any specific preparation methods needed on the item to be measured:** • fixturing and clamping • normalisation • cleaning

Extracting measurement requirements	
Knowledge - What you need to teach	**Skills - What you need to teach**
The student must understand: **K1.34 The most relevant sources to use to extract measurement requirements:** • legislation • ISO and other standards • manuals • specification sheets • catalogues • calibration certificates • accrediting bodies • technical drawings and/or computer aided design models (CAD) • product labels • historical data	The student must be able to: **S1.56 Access and interpret information and documentation (for example, legislation, ISO and other standards, manuals, specification sheets) to extract measurement requirements as appropriate to the measurement task, taking into account:** • the precision of measurement required • cost • time available

Measurement plans	
Knowledge - What you need to teach	**Skills - What you need to teach**
The student must understand: **K1.35 The purpose of planning a task in metrology:** • to identify the measurement need • to plan and allocate adequate resources (for example, time to complete required tasks/meet customer deadlines) • to identify critical tasks and their dependencies (for example, repeat count, sample size and measurement system to be used)	The student must be able to: **S1.57 Create a measurement plan, taking into account:** • selection of the measurement system to be used: o instruments and accessories o measurement procedure (including the use of SOPs) o personnel who perform the measurements

Measurement plans	
• to ensure verifiable results • to ensure compliance with health and safety legislation and safe working practices	• specification standards relating to the equipment • health and safety requirements • operating environmental conditions required • environment conditions for the sample/test piece (for example, stability of sample to light, heat and if special storage conditions are required) • number of repeated measured values to be obtained for the measurement • sampling strategy in relation to checking a sample of a large number of products/goods • how the data will be processed: o recording, tracking and storing data o using controlled software o data analysis • reporting

Environmental effects	
Knowledge - What you need to teach	**Skills - What you need to teach**
The student must understand: **K1.36 How environmental conditions such as temperature, vibration, humidity and lighting can affect both the measuring equipment and the item to be measured, and consequently the data collected:** • the measuring equipment: o dust and particles in the air could cause friction in moving parts o variations in air movement or vibrations could cause instability in the equipment	The student must be able to: **S1.58 Plan and record how to deal with potential environmental conditions, including:** • controlling the effect • compensating for the effect • accepting the effect

Environmental effects	

• the item to be measured:
  ○ variations in temperature could cause deformation in the item
  ○ poor lighting could cause inaccurate readings
K1.37 General approaches to dealing with environmental conditions:
• controlling the effect: normalising the item to be measured to laboratory conditions
• compensating for the effect: determining the effect on the measurement and making a correction for it
• accepting the effect and reporting the limitations of the measurement	

Application of metrology	
Knowledge - What you need to teach	**Skills - What you need to teach**

The student must understand:
K1.38 The role of:
• scientific metrology:
  ○ developing and maintaining measurement standards
• industrial metrology:
  ○ ensuring adequate functioning of measuring instruments and traceability through calibration
• legal metrology:
  ○ application of legal requirements to measurements and measuring instruments
	(no skills in this section)

Application of metrology	
K1.39 The roles of different organisations that support metrology practices: • the International Bureau of Weights and Measures (BIPM): o representing the worldwide measurement community o being a centre for scientific and technical collaboration o being the coordinator of the worldwide measurement system • the General Conference of Weights and Measures (CGPM) and the International Committee for Weights and Measures (CIPM): o working with member states on issues relating to measurement standards and measurement science o the CIPM promotes worldwide uniformity in units of measurement • the CIPM Mutual Recognition Arrangement (MRA): o framework through which National Metrology Institutes demonstrate the international equivalence of their measurement standards and the calibration and measurement certificates they issue • regional metrology organisations (RMOs) (for example, the European Association of National Metrology Institutes (EURAMET) in Europe): o coordinating the procedures and practices across member states • national measurement institutes (NMIs) and designated institutes (DIs), (for example, National Physical Laboratory (NPL) physical metrology, National Measurement	

Application of metrology	
Laboratory at LGC Ltd (chemical and bio-metrology)): ○ developing and maintaining the national primary measurement standards ○ providing representation when liaising with other NMIs and the international metrology and standards organisations ○ responsible for national standards and other services not covered by NMIs • International Standards Organisation (ISO): ○ independent, non-governmental international organisation which develops voluntary, consensus-based, market relevant international standards to which organisations, including science laboratories, adhere ○ providing internationally recognised methods and standards • accredited laboratories: ○ performing types of testing, measurement and calibration in line with the universally accepted international system of units (SI) ○ complying with ISO standards • legal metrology organisations, such as the International Organization of Legal Metrology (OIML): ○ providing mutual recognition systems which reduce trade barriers and global market costs ○ representing the interests of the legal metrology community in matters relating to standardisation, testing, certification and accreditation ○ promoting and facilitating the exchange of knowledge and competencies within the global legal metrology community	

Application of metrology	
K1.40 How metrology can play a role in a range of industries: • healthcare (for example, standardisation of medical products) • forensics (for example, standardisation of analysing equipment) • trade and business (for example, standardisation of packaged goods) • finance (for example, standardisation of coin weight) • infrastructure and buildings (for example, standardisation of building materials) • environment (for example, standardisation of water quality and pollution measurement and control) • food (for example, standardisation of methods ensuring the quality of UK food)	

Customer requirements	
Knowledge - What you need to teach	**Skills - What you need to teach**
The student must understand: **K1.41 The considerations to make when interpreting customer requirements:** • tolerances: knowing what the measurement needs to achieve based upon the functionality of the item being inspected, and what are the acceptable limits of error for the item • timescales: more accurate measurements typically require more time to complete, so understanding the tolerance requirements will dictate what inspection times are required to achieve the tolerances	The student must be able to: **S1.59 Interpret and review customer requirements from a customer brief and identify relevant factors relating to:** • tolerances (for example, the level of accuracy required - insufficient accuracy can prevent an effective evaluation of tolerance) • timescales (for example, the level of accuracy required may affect the time it takes to perform the measurement) • costs (for example, more accurate measurements can be more expensive to

Customer requirements	

• costs:
  ○ the inspection of an item is often at the end of a process, so the measurement must add sufficient value to the quality of the component to offset the cost of the measurement
  ○ in-house or third-party certification can impact on the cost
• methodology and techniques: depend upon the accuracy required and the maximum permissible error
	perform due to equipment costs and/or time costs; higher accuracy than required can lead to increased cost)
	• preferred methodology and techniques (for example, for the required accuracy)
	(GMC9)
	S1.60 Summarise key information relating to customer requirements:
	• appropriate to the audience and purpose
	• using appropriate technical terms
	• listening actively and requesting clarification where appropriate
	(GEC4)

Health and safety in metrology	
Knowledge - What you need to teach	**Skills - What you need to teach**

The student must understand:
K1.42 How to mitigate risk, using control measures:
• elimination: redesigning the activity to remove the hazard
• substitution: replacing a material or process with a less hazardous one
• engineering controls: redesigning the process or equipment to reduce workers' exposure to hazards
• administrative controls: implementing procedures needed to work safely
• PPE: using appropriate equipment to protect the user against risks related to the measurement task
	The student must be able to:
	S1.61 Complete a risk assessment appropriate to the measurement task:
	• step 1: identifying the hazards, including using material and safety data sheets and COSHH sheets for handling possible hazardous samples:
	  ○ chemical (for example, compressed gases, cleaning agents)
	  ○ biological (for example, biological samples)
	  ○ physical (for example, repetitive tasks, noise levels, manual handling)
	• step 2: identifying who might be harmed:
	  ○ how likely is the measurement task to go wrong?

Health and safety in metrology	
	○ who might be harmed? ○ what could be the consequences? • step 3: evaluating the risk and selecting appropriate control measures to plan mitigation (for example, elimination, substitution, engineering and administrative controls and PPE) • step 4: recording the findings and implementation: ○ in a clear and unambiguous way ○ using technical language correctly ○ organising the findings logically and coherently ○ using the appropriate vocabulary, spelling and grammar • step 5: monitoring and reviewing risk management: ○ presenting findings in an appropriate format, using multimedia tools (for example, text and images) (GEC1, GDC2)

Regulations and standards in metrology	
Knowledge - What you need to teach	**Skills - What you need to teach**
The student must understand: **K1.43 The hierarchy of written standards and their application in a metrology environment:** • international and national regulations and standards • industry standards and guidelines • organisational policies, procedures and requirements	The student must be able to: **S1.62 Document in the measurement plan the SOPs that should be followed during the measurement task, including those relevant to safe working practices (for example, handling of tools, equipment, instrumentation and software programs).** **S1.63 Identify in the measurement plan the relevant regulatory procedures and**

Regulations and standards in metrology	
• codes of conduct **K1.44 The importance of following SOPs when carrying out measurement tasks:** • improving reproducibility and consistency • improving reliability and validity of measurement results • ensuring compliance • increasing accountability • ensuring safe working practice relating to the preparation, storage, standards, control and handling of samples, tools, equipment and instrumentation when carrying out measurement tasks	**standards required for the measurement task, taking into account:** • national and international regulations and standards • industry standards • organisational policies, procedures and requirements • codes of conduct

Quality requirements in metrology	
Knowledge - What you need to teach	**Skills - What you need to teach**
The student must understand: **K1.45 The importance of quality requirements within a metrology environment:** • ensures the quality of processes and products • ensures compliance of a product, service or system • provides a framework for managing and continually improving processes • gives formal recognition that an individual or organisation is competent to carry out specific tasks	The student must be able to: **S1.64 Document in the measurement plan the specific quality requirements needed for the measurement task, including:** • quality assurance (QA) and quality control (QC): o are there documented procedures to complete the measurement task? • verification: o is all the required instrumentation calibrated and traceable? • validation: o is the proposed methodology for the measurement task based on good practice, able to provide consistent and traceable results?

Quality requirements in metrology	

	• quality management system (QMS):
	  ○ does the measurement task need to comply with recognised quality management systems, such as ISO standards?
	• accreditation:
	  ○ does the measurement task require formal recognition from a nationally or internationally recognised body, such as UKAS?
	• certification:
	  ○ does the organisation require third-party authorisation to conduct the task?
	• audit systems:
	  ○ does the measurement task need to have a full audit trail? (for example, personnel, standards, instruments used, results, certificates)

Employment and working environments in metrology	
Knowledge - What you need to teach	**Skills - What you need to teach**

The student must understand:
K1.46 Why undertaking continuing professional development (CPD) is important in metrology.
• awareness of new developments within industry, ensuring knowledge stays current and up to date
• demonstrating competency
• allowing for progression in the organisation
• highlighting training needs
	The student must be able to:
	S1.65 Use feedback to develop and improve, by:
	• gaining feedback from peers and teachers in a variety of ways (for example, verbal, written and audio/visual):
	  ○ listening actively to feedback given
	  ○ asking questions for clarification
	  ○ adopting appropriate tone of voice
	• undertaking personal reflection
	(GDC3, GEC6)

Employment and working environments in metrology	
K1.47 Why it is important to remain up to date with the following developments in metrology: • state-of-the-art technology (for example, boosting efficiency and profitability) • automation (for example, increasing efficiency and reducing overall running costs) • large data sets (for example, can be analysed for information to help businesses make better decisions and gain insights) • industry 4.0 (for example, creating new growth opportunities by supporting innovation)	

Performance outcome 2: Perform scientific measurement tasks using the most appropriate measurement for a measurand to ensure accuracy

Accuracy in metrology	
Knowledge - What you need to teach	**Skills - What you need to teach**
The student must understand: **K2.1 The purpose of validation or verification techniques for measuring equipment:** • to comply with any applicable regulatory requirements • to comply with quality standards • to comply with standard operating procedures (SOPs) and/or manufacturers' instructions • to ensure that the environmental conditions are optimal for the instrument (for example, ambient conditions for ideal instrument performance) • to verify that the most up-to-date software is being used **K2.2 The purpose of calibrating and testing metrology equipment:** • to ensure accuracy and traceability of the measurement • to give confidence in the measurement **K2.3 How to check the current calibration status, using:** • calibration labels • calibration certificates • calibration intervals (for example, using calibration history graph and trending) **K2.4 Why it is important to follow the correct escalation route if an instrument's calibration status is not identifiable, or if the instrument is clearly out of calibration:**	The student must be able to: **S2.6 Prepare the work environment in order to perform measurement tasks by:** • measuring the temperature and humidity in order to ensure the suitability and stability of the environment (for example, hygrometer) • setting up the measuring system and the item to be measured **S2.7 Set up the equipment and the item to be measured:** • correctly setting up the equipment in accordance with SOP or manufacturers' instructions • correctly setting up the item (for example, fixturing or clamping) **S2.8 Read and follow a calibration procedure:** • in accordance with SOP or manufacturers' instructions **S2.9 Determine the current calibration status of a system to ensure the equipment is at the required level of accuracy, using:** • calibration labels • calibration certificates • calibration intervals • calibration history graphs and trending, to ensure upper and lower tolerances are not exceeded (GMC1) **S2.10 Select/prepare the correct reference material/standard for the measurement task, taking into account:**

Accuracy in metrology	
• to ensure the integrity of the measuring equipment • to ensure the integrity of the measurement result **K2.5 The escalation route if the calibration status is not identifiable, or if the instrument is clearly out of calibration:** • taking the piece of equipment out of use • labelling the equipment as out of use • reporting the issue to senior colleagues • following the SOP for calibration procedure	• purpose of the measurement task (for example, checking the weighing scales of a coal merchant versus checking the assay of a pharmaceutical product) **S2.11 Perform a measurement task using a developed plan including:** • adhering to relevant standard operating procedures (SOPs), regulatory and quality procedures and standards • using the appropriate equipment for the task • ensuring equipment is used competently and safely, according to relevant SOP, manufacturers' instructions or recognised best practice • manipulating and manoeuvring equipment and the item to be measured effectively • accurately reading displays and measurement scales • accurately recording the results

Performance outcome 3: Collect, analyse and interpret data from measurement tasks

Processing data from measurement tasks	
Knowledge - What you need to teach	**Skills - What you need to teach**
The student must understand: **K3.1 The stages of processing raw data:** • retrieving data: o populations and samples o random and non-random samples o recording data using statistical techniques (for example, using frequency tables)	The student must be able to: **S3.5 Use digital technology to process raw data and record measurement results in line with specifications by:** • retrieving/observing raw data from the measurement task by manual methods or using automated systems: o recording raw data from the measurement task

Processing data from measurement tasks	

• analysing data:
  ○ measures of locations (for example, averages and quartiles)
  ○ measures of spread (for example, range, standard deviation)
• interpreting data:
  ○ representing data (for example, charts, tables, graphs)
  ○ correlation (for example, identifying positive, negative and no correlation)
  ○ regression (for example, interpolate, extrapolate)
  ○ outliers (for example, spurious results)
• evaluating validity of the data in line with specifications:
  ○ expectation and variance
• recognising patterns within the data:
  ○ modelling using a probability distribution
• assessing repeatability and reproducibility:
  ○ hypothesis testing
  ○ confidence intervals
  ○ critical region
K3.2 The purpose of the following techniques to remove spurious results from metrology data:
• image processing: to manipulate images in order to more effectively interpret them
• filtration: to exclude some data in order to analyse subsets of data
• alignments: to arrange and access data in order to identify spurious results
• corrections: to check data in order to remove any obvious spurious measurements
	○ checking raw data for inaccuracies
	  ○ cleansing and organising data for processing
	• processing:
	  ○ inputting cleansed data into appropriate software
	  ○ converting raw data, using algorithms, into meaningful information
	• validating:
	  ○ comparing results against tolerances, through decisions on control limits
	  ○ comparing results against relevant standards (for example, Weights and Measures (Packaged Goods) Regulations 2006)
	• output:
	  ○ representing data in a usable format (for example, graphs, tables, charts)
	  ○ using statistical process control, where appropriate (for example, control charts, control, warning and information limits)
	• storage:
	  ○ storing data securely (for example, password protected spreadsheets, locking computer screens)
	  ○ controlling access to the data
	(GDC4, GDC5)
	S3.6 Identify patterns in collected data:
	• establishing consistent or recurring trends in data
	• using mathematical diagrams (for example, scatter plot or line graphs)
	S3.7 Assess repeatability and reproducibility of measurements to determine any variation

Processing data from measurement tasks	
• data recording: to use the most appropriate recording method to reduce spurious results	**within the data and establish a degree of confidence.**

Analysing data from measurement tasks	
Knowledge - What you need to teach	**Skills - What you need to teach**
The student must understand: **K3.3 Why the following are used to interrogate and critically analyse measurement data:** • statistics: o to gather information from a data set o to make predictions • measurement systems analysis and statistical process control: o to evaluate the measurement process and instruments to ensure the integrity of data for analysis • algebraic formulae: o to perform calculations that contain unknown values • calculations on measurement data: o to characterise the spread in data set in order to calculate standard uncertainty	The student must be able to: **S3.8 Interrogate and critically analyse measurement data to identify any anomalous results:** • using statistics: o mean and range o population and sample standard deviations o standard uncertainty o probability distributions: ▪ normal distribution ▪ rectangular distribution ▪ triangular distribution ▪ u-shaped distribution • using measurement systems analysis and statistical process control: o consistency studies o gauge repeatability and reproducibility studies o control charts o capability and performance indices • using calculations on measurement data: o standard deviation

Analysing data from measurement tasks	
	○ standard uncertainty from Type A evaluations (from statistical analysis of repeated measured values) ○ combined standard uncertainty in the case of an additive measurement model (from Type A and Type B evaluations of uncertainty) ○ expanded uncertainty using the correct coverage factor for a given coverage probability, assuming a normal distribution ○ appropriate number of significant figures when reporting results • by comparing the measurement results to the specification/customer requirements (GMC6) **S3.9 Re-run investigations to assess invalid data.** **S3.10 Contribute to the production of reports and other measurement documentation by:** • using calculations, diagrams and data representations to support technical arguments • reasoning with mathematics and drawing conclusions (for example, pass, fail and concept of shared risk) • using industry standard conventions/notations as required (GMC8) **S3.11 Present data/results in the most appropriate format to meet customer requirements (for example, production of reports and other measurement documentation):** • using appropriate technology for the task • using appropriate numbers and significant figures

Analysing data from measurement tasks	

	• organising ideas logically and coherently
	• explaining data in a clear and unambiguous way, taking into account the level and experience of the customer
	• using technical language correctly, and using graphics and other tools to aid understanding
	• reports and other measurement documentation may include:
	  ○ diagrams, tables, charts and graphs
	  ○ uncertainty statements
	  ○ results of conformity assessment
	  ○ measurement system analysis and statistical process control reports
	(GEC1, GEC2, GMC7)

Reviewing data obtained	
Knowledge - What you need to teach	**Skills - What you need to teach**

The student must understand:
K3.4 How to review the measurement data obtained against measurement requirements, by:
• assessing data throughout the measurement:
  ○ checking for anomalies and repeating measurement if required
  ○ checking consistency of repeated measurements
• checking accuracy of calculations and transcription of data
• assessing conformity to specifications:
	(no skills in this section)

Reviewing data obtained	
○ the role of tolerances and measurement uncertainty in assessing whether an item meets the specification ○ requirements of ISO14253 and JCGM 106:2012 from the Joint Committee for Guides in Metrology (JCGM)	

Performance outcome 4: Identify and resolve issues with measurement tools and equipment

Identifying and resolving issues in metrology	
Knowledge - What you need to teach	**Skills - What you need to teach**
The student must understand: **K4.1 How to recognise when measuring equipment is operating incorrectly:** • based on observation/visual inspection: ○ obvious damage to the equipment ○ missing components from the equipment ○ calibration certificate is out of date • based on the operation of the equipment: ○ drift in the display of the instrument ○ inability to zero the equipment ○ positioning, alignment and/or levelling of equipment ○ environmental factors which may affect results • based on measurement data: ○ unacceptably large standard deviation of repeated measured values ○ identification of systematic effects ○ results of verification tests and interim checks	The student must be able to: **S4.4 Use problem solving techniques to identify issues relating to measuring equipment by:** • interrogating and critically analysing measurement data • using results from verification tests and interim checks • using measurement system analysis • conducting an observation/visual inspection of equipment (GMC6) **S4.5 Discuss measurement results and issues with peers to determine when issues need to be escalated by:** • summing up key points • making relevant and constructive contributions to move discussions forward • encouraging contributions from other participants • actively listening to others' contributions (GEC6)

Identifying and resolving issues in metrology	
○ measurement system analysis techniques **K4.2 The employee's responsibilities when an anomaly in the measurement process has been identified:** • discussing anomalies with peers to sense-check • judging when to pause or stop a process • following the organisation's quality management system (for example, recording information as appropriate) • escalating to senior metrology colleagues as appropriate **K4.3 The considerations to make when measuring equipment is in need of repair:** • is the piece of equipment critical to operations? • are there relevant SOPs and/or manufacturer information available to support the repair? • who is competent enough to carry out the repairs? ○ the individual ○ another colleague ○ approved repairers or manufacturer • is the repair complex (for example, include issues with the internal systems of the instrument) or basic (for example, blown fuse)? • who needs to be informed of the issue?	**S4.6 Source expert help from senior colleagues or others on metrology issues by:** • following the appropriate escalation process • accurately describing the issue to a senior colleague by: ○ summing up key points ○ expressing opinions and supporting these with relevant and persuasive arguments ○ asking and responding to questions for clarification (GEC6) **S4.7 Follow the process for basic repairs on measurement equipment by:** • having a thorough understanding of the issue (for example, power interruption to equipment, instrument not levelled, leads pulled out from equipment, misalignment, environmental issues) • labelling the item as 'not in use' • following relevant SOPs for basic repair and maintenance • verifying the item against specification before it is put back into service • communicating that the equipment is back in use (for example, updating the equipment record) (GMC10)

Section 5: TQ glossary

TQ specification

Student:

The person studying the technical qualification (‘The student must…’).

Tutor:

The individual delivering the technical qualification.

Provider

The centre delivering the technical qualification.

Series

Assessments which must be attempted in the same assessment window, such as paper A and paper B of the core examination.

Assessment mode

The assessment mode is how an assessment is made available and/or administered to students. For example, a written examination can be administered to students via an onscreen platform or via a traditional paper-based document.

Section 6: Additional information

Annual monitoring visits

Our quality assurance team will monitor all approved TQ providers on an ongoing basis. All providers delivering the TQ will be quality assured at least once a year to ensure that they are delivering in line with required standards. Annual monitoring reviews will be carried out either face-to-face or remotely by quality assurers appointed, trained and monitored by us. Providers will be allocated a quality assurer upon approval. Our quality assurers will complete a report following each annual review to record and share their findings.

Guided learning hours (GLH)

Guided learning is the activity of a student being taught or instructed by - or otherwise participating in education or training under the immediate guidance or supervision of - a lecturer, supervisor, tutor or other appropriate provider of education or training.

For these purposes, the activity of ‘participating in education or training’ shall be treated as including the activity of being assessed, if the assessment takes place under the immediate guidance or supervision of a lecturer, supervisor, tutor or other appropriate provider of education or training.

Total qualification time (TQT)

Total qualification time is an estimate of the minimum number of hours that an average student would require in order to complete a qualification.

Total qualification time comprises:

- the guided learning hours for the qualification
- an estimate of the number of hours a student will likely spend in preparation, study or any other form of participation in education or training, including assessment, which takes place as directed by - but not under the immediate guidance or supervision of - a lecturer, supervisor, tutor or other appropriate provider of education or training

Essential skills

While completing this qualification, students have an opportunity to develop the knowledge, understanding and essential skills employers look for in employees. These range from familiar ‘key skills’, such as team working, independent learning and problem solving, to more tricky-to-measure skills, such as:

- appropriate workplace behaviour and dress
- appropriate interpersonal skills
- communicating with professional colleagues/peers and/or hierarchical seniors
- supporting other aspiring employees
- personal manners
- understanding work practices and how different roles and departments function within an organisation

Recognition of prior learning (RPL)

Recognition of prior learning may be applied to the core component only.

Providers may, at their discretion, recognise prior learning if they are satisfied that the evidence provided meets the qualification's requirements.

For more information, please refer to the Recognition of Prior Learning (RPL) Credit Accumulation and Transfer (CAT) Policy on the Policies and Documents page on the NCFE website.

Qualification dates

We review qualifications regularly, working with sector representatives, vocational experts and stakeholders to make any changes necessary to meet sector needs and to reflect recent developments.

If a decision is made to withdraw a qualification, we will set an operational end date and provide reasonable notice to our providers. We will also take all reasonable steps to protect students' interests.

An operational end date will only show on the regulator's qualification database and on our website if a decision has been made to withdraw a qualification. After this date, we can no longer accept student registrations.

This qualification has external assessments, which can only be taken up to the last assessment date set by us. No external assessments must be permitted after this date, so students must be entered in sufficient time. Please visit the NCFE website for more information.

Staffing requirements

Providers delivering any of our qualifications must:

- have a sufficient number of appropriately qualified/experienced tutors to deliver the technical qualification to the volume of students they intend to register
- ensure that all staff involved in delivery are provided with appropriate training and undertake meaningful and relevant continuing professional development
- implement effective processes to ensure all delivery is sufficient and current, this should include standardisation to ensure consistency of delivery
- provide all staff involved in the delivery process with sufficient time and resources to carry out their roles effectively

Core staffing requirements

Staff involved in the delivery of the core component must be able to demonstrate that they have (or are working towards) the relevant occupational knowledge and/or occupational competence in science, at the same level or higher as the qualification being delivered. This may be gained through experience and/or qualifications.

Occupational specialism staffing requirements

Staff involved in the delivery of the occupational specialism content must be able to demonstrate that they have (or are working towards) the relevant occupational knowledge and/or occupational competence in the relevant occupational specialism area, at the same level or higher as the qualification being delivered. This may be gained through experience and/or qualifications.

Resource requirements

Providers must ensure that the student has access to the necessary materials, resources and workspaces for delivery and assessment of mandatory knowledge and skills. The following lists are not exhaustive. Please refer to the qualification content for a more detailed indication of the required resources.

General:

- computer
- internet access
- audio/visual recording equipment

Occupational specialism - Technical: laboratory sciences

- access to a standard teaching science laboratory
- access to standard teaching laboratory equipment including microbiological equipment
- data analysis software; SPSS or Microsoft Excel
- access to computer exam room for online assessments
- printers/computer access
- various stationery
- PPE

Occupational specialism - Technical: food sciences

- access to a standard teaching kitchen or development kitchen
- access to standard teaching kitchen/food technology equipment including microbiological equipment
- data analysis software; SPSS or Microsoft Excel
- access to computer exam room for online assessments
- printers/computer access
- various stationery
- resources for hosting a food tasting panel
- PPE

Occupational specialism - Technical: metrology sciences

- access to a laboratory or workshop suitable for accurate metrological measurement
- access to standard metrology laboratory equipment including a range of measuring devices
- data analysis software; SPSS or Microsoft Excel
- access to computer exam room for online assessments
- printers/computer access

- various stationery
- PPE

Customer support team

Our customer support team will support you with approvals, registrations, moderation, external assessment, results and general queries.

Fees and pricing

Fees will be made available to eligible and approved providers.

Training and support for providers

Our provider development team's primary purpose is to support providers and teaching teams in the delivery of this qualification. There are a number of ways in which we can do this, which include:

- providing bespoke one-to-one support with the delivery staff
- delivering face to face events at numerous locations throughout the country
- facilitating delivery and CPD webinars
- signposting you to teaching and learning resources
- providing you with delivery updates on the technical qualification

The variety of support available includes:

- content structure
- teaching strategies
- SEN guidance
- quality assurance
- assessment preparation and blended learning

Should you wish to discuss your teaching and delivery requirements, please email: provider.development@ncfe.org.uk.mailto:

Useful websites and sources of information

Core

Section B: science concepts

Cell structure and function

What is a cell: www.yourgenome.org/facts/what-is-a-cell

What is mitosis: www.yourgenome.org/facts/what-is-mitosis

What is meiosis: www.yourgenome.org/facts/what-is-meiosis

Mitosis versus meiosis: www.yourgenome.org/facts/mitosis-versus-meiosis

What is a stem cell: www.yourgenome.org/facts/what-is-a-stem-cell

Genomics/genetics

What is a genome: www.yourgenome.org/facts/what-is-a-genome

What is DNA: www.yourgenome.org/facts/what-is-dna

What is a gene: www.yourgenome.org/facts/what-is-a-gene

What is DNA replication: www.yourgenome.org/facts/what-is-dna-replication

What is genetic variation: www.yourgenome.org/facts/what-is-genetic-variation

What is a mutation: www.yourgenome.org/facts/what-is-a-mutation

DNA replication 3d animation: www.yourgenome.org/video/dna-replication

DNA to protein 3d animation: www.yourgenome.org/video/from-dna-to-protein

Pathogens

What is antibiotic resistance: www.yourgenome.org/facts/what-is-antibiotic-resistance

What are staphylococcal infections: www.yourgenome.org/facts/what-are-staphylococcal-infections

What are streptococcal infections: www.yourgenome.org/facts/what-are-streptococcal-infections

What is TB: www.yourgenome.org/facts/what-is-tuberculosis

What is salmonella: www.yourgenome.org/facts/what-is-salmonella

What are helminths: www.yourgenome.org/facts/what-are-helminths

What is malaria: www.yourgenome.org/facts/what-is-malaria

Occupational specialism: laboratory sciences

Stem Learning - www.stem.org.uk/

www.stem.org.uk/resources/curated-collections/secondary-and-level-science-0

Health and Safety Executive - www.hse.gov.uk/simple-health-safety/risk/index.htm

The Essential Chemical Industry - online - www.essentialchemicalindustry.org

Wellcome - wellcome.ac.uk/

The Association of the British Pharmaceutical Industry (ABPI) - www.abpischools.org.uk/

Association for Science Education - www.ase.org.uk/

Occupational specialism: food sciences

Health and Safety Executive - www.hse.gov.uk/simple-health-safety/risk/index.htm

National Health Service (NHS) - www.nhs.uk/live-well/eat-well/what-are-reference-intakes-on-food-labels/

Food Standards Agency - www.food.gov.uk

Chilled Food Association - www.chilledfood.org

Campden BRI - www.campdenbri.co.uk

Food manufacture - www.foodmanufacture.co.uk/

Food Authenticity Network - www.foodauthenticity.uk

Occupational specialism: metrology sciences

National Physical Laboratory (NPL) - www.npl.co.uk/

UK National Measurement Laboratory - www.lgcgroup.com/measurement-services/training-and-consultancy/best-practice-guides/

Eurachem - www.eurachem.org/index.php/publications/guides

WELMEC (European Cooperation in Legal Metrology) - www.welmec.org

International Organization of Legal Metrology - www.oiml.org

National Institute of Standards and Technology (USA) - www.nist.gov

Learning resources

We offer a wide range of bespoke learning resources and materials to support the delivery of this qualification, including:

- schemes of work
- tutor delivery guides

Please check the qualifications page on the NCFE website for more information on the resources available for this qualification.

Equal opportunities

We fully support the principle of equal opportunities and oppose all unlawful or unfair discrimination on the grounds of ability, age, colour, culture, disability, domestic circumstances, employment status, gender, marital status, nationality, political orientation, racial origin, religious beliefs, sexual orientation and social background. We aim to ensure that equality of opportunity is promoted and that unlawful or unfair discrimination, whether direct or indirect, is eliminated both in our employment practices and in access to qualifications. A copy of our diversity and equality policy is available on request.

Diversity, access and inclusion

Our qualifications and associated assessments are designed to be accessible, inclusive and non-discriminatory. We regularly evaluate and monitor the 6 diversity strands (gender, age, race, disability, religion, sexual orientation) throughout the development process as well as throughout the delivery, external quality assurance and external assessment processes of live qualifications. This ensures that positive attitudes and good relations are promoted, discriminatory language is not used and our assessment procedures are fully inclusive.

This policy is aimed at anyone who uses our products and services and who submits requests for reasonable adjustments and special considerations. Students who require reasonable adjustments or special consideration should discuss their requirements with their tutor.

The most up-to-date version of the policy can be found on the NCFE website where providers can find details of how to request a reasonable adjustment or special consideration.

Contact us

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Version 2.0 19 June 2023

Document information

The T Level Technical Qualification is a qualification approved and managed by the Institute for Apprenticeships and Technical Education. NCFE is currently authorised by the Institute to develop and deliver the T Level Technical Qualification in Science.

Owner: Qualifications Development Manager

Change history record

Version	Description of change	Approval	Date of Issue
v1.0	Post approval, updated for publication.		January 2021
v1.1	Update to Section 1 (Institute reference: ODSR_S_001 - ODSR_S_004)		March 2021
v1.2	Update to Section 2 and Section 4 (Institute reference ODSR_S_021 and ODSR_S_022)		April 2021
v1.3	Branding updated Updates to Sections 1, 2 and 4 (Institute reference ODSR_S_025-ODSR_S_033)		September 2021
v1.4	Updated title of personal protective equipment regulations to correct version (1992) (Institute reference ODSR_S_034)	October 2021	January 2022
v1.5	Updates to English and Mathematics exit requirements (ODSR_S_119, 120, 123) Added temporary flexibilities for industry placements (ODSR _S_122) Minor amends to terminology (ODSR_S_124, 125,) Additional clarification in CS4.1 around analysing results (ODSR_S_126) Other minor updates/typos (ODSR_S_121, 127, 128, 129) Further clarification to content in Section 4/Section B (ODSR_S_TBC)	May 2022	January 2023

v2.0	The following amendments have been made to this qualification specification following annual review. **General changes:** • clarification provided regarding registering students on T Levels and transferring between T Levels and occupation specialisms • amending language to make it more consistent • updated assessment information • updated wording to give clarity of internet usage for assessments • training and support for providers information has been updated • legislations, regulations and acts have been added and dates updated, where applicable • separating or merging bullet points that cover different or similar information • resource requirements section updated to specify that 'providers must ensure that the student has access to the necessary materials, resources and workspaces for delivery and assessment of mandatory knowledge and skills. The following lists are not exhaustive' and reference to PPE has been added • resource list has been updated • the glossary section has been updated to include 'Measurand' • throughout the specification, where referenced, 'causative agents' has been amended to 'pathogens (causative agents)' • all reference to GDPR has been updated to UK GDPR **Amendments made to the core component section:** • in A6.9 wording has been amended from 'the purpose of the following statistical techniques when analysing data' to 'how to carry out the following statistical techniques when analysing data and their purpose' • in B1.14, reference to 'nucleotides are the molecules from which DNA and RNA are formed' has been amended to 'nucleotides are the molecules (monomers) from which DNA and RNA are formed' • in B1.18, 'a spontaneous change in the DNA sequence can lead to genetic variations' has been amended to 'a mutation (spontaneous change in the DNA sequence) can lead to genetic variation'	May 2023	19 June 2023

	• in B1.24, reference to ‘organism’ has been amended to a “microorganism” • in B1.25, reference to ‘protoctists’ has been updated to ‘protists’ • in B1.32 ‘role of vaccinations in relation to T and B memory cells’ has been added as a bullet point • in B1.51, ‘the shape and direction of the magnetic field around bar magnets, and the relationship between the strength of the field and concentration of lines’ has been updated to ‘the shape and direction of the magnetic field around bar magnets, and the relationship between the strength of the field and concentration of field lines’ • in B1.56, reference to ‘X-rays’ has been amended to ‘X-rays for imaging’, and ‘cleaning computer equipment’ has been amended to ‘cleaning laboratory equipment’ • in B2.6, reference to ‘diploid’ has been added • in B2.7, ‘how the process of mitosis results in the formation of 2 genetically identical daughter cells’ has been amended and updated • in B2.10, the term ‘energy’ has been removed from the equation • in B2.11, the equation has been updated **Amendments made to the Laboratory Sciences occupational specialism section, including:** • in K1.31, reference to ‘NADH reductase’ has been updated with ‘NADH dehydrogenase’ • in K1.31, amendments have been made to the bullet points to provide further clarification and clarity • in K1.31, reference to ‘power’ has been amended ‘energy’ • in K1.31, further clarification regarding Krebs cycle has been added • in K1.31, reference to ‘involves 9 steps with 10 reactions’ has been updated to read ‘involves 10 reactions’ • in K1.33, ‘enzymes are inhibited by certain substances’ has been updated to ‘enzymes are inhibited by certain substances known as inhibitors’ • in K1.51, ‘electrochemistry to separate and then identify parts of a compound (for example, chlorine gas)’ has been amended to ‘electrolysis to separate compounds (for example, chlorine gas from chlorine compounds)’ • in K1.51, reference to ‘thermochemistry to analyse energy changes in chemical or physical transformations’ has been removed		

Schedule 3

Implementation

The content for this Schedule is as below:

1. **GEN2 W2 Science Implementation Plan**

2. **GEN2 W2 Science Resource Plan**

Schedule 3

Implementation Plan

Schedule 3

Resource Plan

Schedule 4

Co-operation

1 Objective of the joint arrangements

1.1 The Supplier shall cooperate, coordinate and seek to agree certain arrangements with all third party Awarding Organisations, including the Former Supplier, involved in the delivery of the technical education qualification element of each T Level forming part of the T Levels Programme ("**T Level Awarding Organisations**") from time to time with the aim of:

1.1.1 ensuring the quality, consistency, efficiency and effectiveness of the T Levels Programme as a whole; and

1.1.2 in the interest of Students and Providers, streamlining administration relating to the T Levels Programme.

1.2 The Supplier shall ensure that all activities carried out by it under this Schedule appropriately take into account the views of each T Level Awarding Organisation (including T Level Awarding Organisations appointed subsequent and/or prior to the appointment of the Supplier) and do not risk or result in:

1.2.1 a disproportionate burden falling on any given T Level Awarding Organisation or on Providers; and/or

1.2.2 a disproportionate burden (whether by any act or omission on the part of the Supplier) on Providers and/or Students.

2 Joint arrangements

2.1 In particular, the Supplier shall (at its own cost):

2.1.1 attend a meeting convened by the Authority (on reasonable prior notice and at least once per calendar quarter) with all other T Level Awarding Organisations to discuss progress on coordination efforts including the activities set out below, and to make decisions relating to any outstanding areas of coordination;

2.1.2 in order to minimise the administrative burden on Providers, cooperate with all other T Level Awarding Organisations to coordinate and deliver an efficient method of both regular and ad hoc inspections (on an ongoing basis) of the

delivery by Approved Providers of the technical education qualification element of each T Level, to ensure that the relevant Approved Providers continue to meet the requirements of their Provider Approval by the Supplier and equivalent approval by other T Level Awarding Organisations, provided always that where, as a result of such cooperation and/or coordination it is necessary for the Supplier to amend and/or modify that part of the Supplier's Response to which the provisions of paragraph 3.1.2 of Part 1 of the Service Requirements apply, then the Supplier shall obtain Approval to such amendment and/or modification;

2.1.3 coordinate and seek to agree with all other T Level Awarding Organisations (at the earliest possible date) common rules and guidance applicable to the teaching and assessment of and provision of Post-Results Services for the technical education qualification element of each T Level with the aim of having aligned rules, guidance and Post-Results Services, where appropriate, across the T Levels Programme, addressing topics such as conducting examinations;

2.1.4 share information between T Level Awarding Organisations as necessary (subject to the relevant obligations on confidentiality in this Contract) to:

2.1.4.1 facilitate the joint arrangements anticipated by this Schedule;

2.1.4.2 enable transfer of achievement of the TQ Core Component of a T Level between T Level Awarding Organisations; and

2.1.4.3 enable results analysis in respect of the Route of which the TQ forms part;

2.1.5 where possible, utilise systems in the delivery of the Services which are interoperable with those utilised by other T Level Awarding Organisations so as to facilitate the portability of the Services to any Future Supplier;

2.1.6 coordinate and seek to agree with all other T Level Awarding Organisations pre-assessment access arrangements for T Levels to ensure equivalence of approach between T Level Awarding Organisations;

2.1.7 adopt a common process and, where possible, system, to that used by other T Level Awarding Organisations for applications for access arrangements for T Levels to be made and considered for the benefit of Students;

2.1.8 coordinate and seek to agree with all other T Level Awarding Organisations a common process and approach and, where possible, system to that used by other T Level Awarding Organisations, to manage and/or facilitate Reasonable Adjustments and/or applications for Special Consideration to ensure equivalence of approach between T Level Awarding Organisations;

2.1.9 seek to agree between T Level Awarding Organisations a Key Dates Schedule, such schedule to be developed in consultation with the Department, GCE Awarding Organisations, Providers and UCAS and to be Approved by the Authority;

2.1.10 attend regular meetings (at least once per calendar month unless otherwise notified by the Authority) with all other T Level Awarding Organisations to discuss operational issues in relation to the T Level Programme;

2.1.11 in order to minimise the administrative burden on Providers, co-operate with the Former Supplier, where relevant, to facilitate a smooth transition during the Entry Transition Period; and

2.1.12 where notified by the Authority, work with other T Level Awarding Organisations responsible for TQs in the same Route with the aim to, where appropriate, harmonise the common TQ Core Component across that Route.

3 Disputes relating to joint arrangements

3.1 In the event the Supplier contends that it is unable to meet its obligations under this Schedule as a result of the action or inaction of one or more third party T Level Awarding Organisation, the Supplier shall seek to resolve such matter with the relevant T Level Awarding Organisation(s). In the event that the Supplier is unable to resolve such matter, having used its reasonable endeavours to do so, the Supplier shall promptly notify the Authority in writing with the relevant details including the steps taken to attempt to resolve the matter, and the Authority shall use its reasonable endeavours to promptly resolve such matter.

3.2 In the event that a third party T Level Awarding Organisation contends that it is unable to meet its joint arrangement obligations as a result of the action or inaction of the Supplier, then the Supplier shall comply with the reasonable instructions of the Authority in relation to such action or inaction.

3.3 Nothing in this Schedule (including any failure to agree any matters referred to in paragraph 2 of this Schedule) shall operate to reduce or otherwise diminish the Supplier's obligations and/or the Authority's rights under this Contract.

4 Reporting

4.1 The Supplier shall, on request by the Authority, promptly provide a written report to the Authority setting out its progress in achieving the joint arrangements set out in paragraph 2 of this Schedule.

Schedule 5

Supplier's Response

The content for this Schedule is as below:

1. **GEN2 W2 Science Risk Register**
2. **GEN2 W2 Science AQ9.1-10.7 Supplier Responses**
3. **GEN2 W2 Science Q9.5 Grading and Awarding Structure**
4. **GEN2 W2 Science Q10.4 Internal Quality Assurance Process**
5. **GEN2 W2 Science Q10.7 Management and Governance**
6. **GEN2 W2 Science Q10.7 Escalation Process Flow**
7. **GEN2 W2 Science Issues Log**
8. **GEN2 W2 Pearson Clarifications**
9. **GEN2 W2 Science Employer Provider Engagement Strategy**

Schedule 5

Risk Register

Schedule 5

Supplier Responses

Schedule 5

Grading and Awarding Structure

Schedule 5

Internal Quality Assurance Process

Schedule 5

Management and Governance

Schedule 5

Escalation Process Flow

Schedule 5

Issues Log

Schedule 5

Clarifications

Schedule 5

Employer and Provider Engagement Strategy

Schedule 6

Pricing Schedule

The content for this Schedule is as below:

GEN2 W2 Science Pricing Schedule

Schedule 6A

Adaptive Pricing

1. The Review Triggers

1.1 The Parties agree that the Entry Fee, as referred to in Schedule 6, shall be reviewed and may change, in the following two instances:

1.1.1 in or around December 2027, which shall be referred to as the Mid-Term Review; and

1.1.2 in the event that the Authority seeks to extend the Contract in accordance with clause 2.2 and 15.2 of the Contract, in or around December 2030, which shall be referred to as the Extension Review.

The Mid Term Review

2.1 On or around 1st December 2027 the Authority shall provide the Supplier with an updated projection of total learner volumes for the five Exclusive Cohorts under the Contract which shall be referred to as the Updated Projection.

2.2 The Updated Projection shall be calculated by the Authority by combining the actual learner volumes for Exclusive Cohorts one and two, as confirmed by the Department to the Authority, with the revised estimates for the remaining three Exclusive cohorts of the Contract, as determined by the Department and confirmed to the Authority.

Circumstances in which an Enhanced Entry Fee is permitted

2.3 Where the Updated Projection is calculated to be at least 15% less than the total learner volume contained in the original tender documents, which shall be referred to as the Initial Projection, the Authority shall determine a revision to the Entry Fee which shall be referred to as the Enhanced Entry Fee and will be in such amount as to enable the Supplier to retain the opportunity to achieve its % profit margin, as set out in Schedule 6, over the life of the original Contract and;

2.3.1 the Authority shall notify the Supplier in writing, on or before the 31st December 2027 of the Enhanced Entry Fee;

2.3.2 by no later than the end of February in the Academic Year prior to the Academic Year in which the Enhanced Entry Fee may be applied the Supplier shall notify the Authority in writing of its intention to substitute the Entry Fee with the Enhanced Entry Fee, or such other Entry Fee not exceeding the Enhanced Entry Fee, as the case may be;

2.3.3 for the avoidance of doubt, any Entry Fee to be adopted by the Supplier pursuant to the provisions of this paragraph 2.3, will also incorporate any adjustments proposed by the Supplier under clause 4.12 of the Contract. The collective adjustments calculated in accordance with this paragraph 2.3 and or clause 4.12 will not exceed the Enhanced Entry Fee.

2.3.4 Any Enhanced Entry Fee shall apply for the Cohort for the Academic Year commencing 1 August 2028 and shall continue to apply to the Cohort for the Academic Year commencing 1 August 2029 and the Cohort for the Academic Year commencing 1 August 2030 and may be subject to later adjustments effected by the further application of clause 4.12 of the Contract.

Circumstances in which a Reduced Entry Fee will be required

2.4 Where the Updated Projection is calculated to be at least 15% more than the Initial Projection, the Authority shall determine a reduced Entry Fee which shall be referred to as the Reduced Entry Fee which will be in such amount as to enable the Supplier to retain the opportunity to achieve, but not exceed, its % profit margin, as set out in Schedule 6.

2.4.1 The Authority shall notify the Supplier in writing, on or before the 31st December 2027 of the Reduced Entry Fee;

2.4.2 For the avoidance of doubt, the Reduced Entry Fee will also incorporate any adjustments proposed by the Supplier under clause 4.12 of the Contract.

2.4.3 The Reduced Entry Fee shall apply for the Cohort for the Academic Year commencing 1 August 2028 and shall apply to the Cohort for the Academic Year commencing 1 August 2029 and the Cohort for the Academic Year commencing 1 August 2030, and may be subject to later adjustments effected by the further application of clause 4.12 of the Contract.

3. The Extension Review

3.1 In the event of notification by the Authority to the Supplier of their intention to extend the Contract in accordance with clause 2.2 and 15.2, which shall be referred to as 'the First Extension Period', the Authority shall:

3.1.1 before the end of the final Exclusive Cohort, provide the Supplier with the projection of learners for the Academic Years which fall within the First Extension Period following the end of the fifth Exclusive Cohort, as determined by the Department and confirmed to the Authority, which shall be referred to as the Final Updated Projection;

3.1.2 where the Final Updated Projection is calculated to be at least 15% less than the Updated Projection for the fifth Exclusive Cohort, calculate the Entry Fee applicable to the First Extension which shall be referred to as the Extension Entry Fee, in such a sum which ensures that the Supplier retains the opportunity to achieve its % profit margin, as set out in Schedule 6, during the First Extension Period;

3.1.3 the Authority shall notify the Supplier in writing, on or before the 31st December 2030 of the Extension Entry Fee;

3.1.4 by no later than the end of February in the Academic Year prior to the Academic Year in which the Extension Entry Fee may be applied the Supplier shall notify the Authority in writing of its intention to substitute the Entry Fee with such other Entry Fee not exceeding the Extension Entry Fee, as the case may be;

3.1.5 the Extension Entry Fee shall also incorporate any adjustments to the Entry Fee effected by the application of clause 4.12;

3.1.6 any Extension Entry Fee shall apply for the Cohorts for the Academic Years which fall within the First Extension Period.

3.2 In the event that the Authority seeks to extend the Contract beyond the First Extension Period, in accordance with the provisions of clause 2.2 and 15.2 of the Contract, the Extension Entry Fee shall not be amended further save for any adjustments effected by the application of clause 4.12.

Circumstances in which a Reduced Extension Entry Fee will be required

3.3 Where the Final Updated Projection is calculated to be at least 15% more than the Updated Projection for the fifth Exclusive Cohort, the Authority shall determine a reduced Entry Fee which shall be referred to as the 'Reduced Extension Entry Fee' which will be in such amount as to enable the Supplier to retain the opportunity to achieve, but not exceed, its % profit margin, as set out in Schedule 6.

3.3.1 The Authority shall notify the Supplier in writing, on or before the 31st December 2030 of the Reduced Extension Entry Fee;

3.3.2 For the avoidance of doubt, the Reduced Extension Entry Fee will also incorporate any adjustments proposed by the Supplier under clause 4.12 of the Contract.

3.3.3 The Reduced Extension Entry Fee shall apply for the Cohorts for the Academic Years which fall in with the First Extension Period, and may be subject to later adjustments effected by the further application of clause 4.12 of the Contract.

4. General

4.1 The Authority does not provide any assurance that the Updated Projection will be achieved, and the Supplier bears all risks arising from any variance between the Updated Projection, the Final Updated Projection and the actual learner volumes that emerge through the life of the contract.

Schedule 7

Staff (including Key Personnel)

1 Key Personnel

1.1 The Supplier shall ensure that the Key Personnel fulfil the Key Roles during the Term. The Annex to this Schedule 7 lists the Key Roles, remit and names of the persons who the Supplier shall appoint to fill those Key Roles at the Effective Date.

1.2 The Authority can identify any further roles as being Key Roles and, following agreement on this by the Supplier (such agreement not to be unreasonably withheld or delayed) any relevant person selected to fill those Key Roles (and details of the role itself) shall be included on the list of Key Personnel in the Annex to this Schedule 7.

1.3 The Supplier shall not remove or replace any Key Personnel (including when carrying out its obligations under Schedule 12 (*Exit Management*)) unless:

1.3.1 requested to do so by the Authority;

1.3.2 the person concerned resigns, retires or dies or is on maternity or long-term sick leave;

1.3.3 the person's employment or contractual arrangement with the Supplier or a Subcontractor is terminated for material breach of contract by the employee; or

1.3.4 the Supplier obtains Approval (such Approval not to be unreasonably withheld or delayed).

1.4 The Supplier shall:

1.4.1 notify the Authority promptly of the absence of any Key Personnel (other than for short-term sickness or holidays of 2 weeks or less, in which case the Supplier shall ensure appropriate temporary cover for that Key Role);

1.4.2 ensure that any Key Role is not vacant for any longer than 10 Working Days;

1.4.3 give as much notice as is reasonably practicable of its intention to remove or replace any member of Key Personnel and, except in the cases of death, unexpected ill health or a material breach of the Key Personnel's employment contract, this will mean at least 60 Working Days' notice;

1.4.4 ensure that all arrangements for planned changes in Key Personnel provide adequate periods during which incoming and outgoing personnel work together to transfer responsibilities and ensure that such change does not have an adverse impact on the performance of the Services and/or supply of any Products; and

1.4.5 ensure that any replacement for a Key Role:

(i) has a level of qualifications and experience appropriate to the relevant Key Role; and

(ii) is fully competent to carry out the tasks assigned to the Key Personnel whom he or she has replaced.

2 Staff vetting

2.1 For the purposes of this paragraph 2, "**Convictions**" means, other than in relation to minor road traffic offences, any previous or pending prosecutions, convictions, cautions and binding-over orders (including any spent convictions as contemplated by section 1(1) of the Rehabilitation of Offenders Act 1974 or any replacement or amendment to that Act).

2.2 The Supplier shall ensure that all potential Supplier Staff or persons performing any of the Services during the Term who may reasonably be expected in the course of performing any of the Services under this Contract to have access to or come into contact with Students or vulnerable persons (and/or access to data or information relating to such Students or vulnerable persons) are, to the extent permitted by Law:

2.2.1 questioned concerning their Convictions; and

2.2.2 required to obtain appropriate disclosures from the Disclosure and Barring Service (or other appropriate body) where required by Law,

before the Supplier engages the potential staff or persons in the provision of the Services.

2.3 The Supplier shall take all necessary steps to ensure that such potential staff or persons referred to in paragraph 2.2 obtain standard and enhanced disclosures from the Disclosure and Barring Service (or other appropriate body) and shall ensure all

such disclosures are kept up to date. The obtaining of such disclosures shall be at the Supplier's cost and expense.

2.4 The Supplier shall ensure that no person is employed or otherwise engaged in the provision of the Services without the Authority's prior written consent if:

2.4.1 the person has disclosed and Convictions upon being questioned about their Convictions in accordance with paragraph 2.2.1;

2.4.2 the person is found to have any Convictions following receipt of standard and/or enhanced disclosures from the Disclosure and Barring Service (or other appropriate body) in accordance with paragraph 2.2.2; or

2.4.3 the person fails to obtain standard and/or enhanced disclosures from the Disclosure and Barring Service (or other appropriate body) upon request by the Supplier under paragraph 2.2.2.

2.5 In addition to the requirements of paragraphs 2.1 to 2.4, where the Services are or include regulated activities as defined by the Safeguarding Vulnerable Groups Act 2006 the Supplier shall:

2.5.1 comply with all requirements placed on it by the Safeguarding Vulnerable Groups Act 2006;

2.5.2 ensure that it has no reason to believe that any member of Supplier Staff is barred in accordance with the Safeguarding Vulnerable Groups Act 2006; and

2.5.3 ensure that no person is employed or otherwise engaged in the provision of the Services if that person is barred from carrying out, or whose previous conduct or records indicate that they would not be suitable to carry out, any regulated activities as defined by the Safeguarding Vulnerable Groups Act 2006 or may present a risk to Students or any other person.

2.6 The Supplier shall ensure that the Authority is kept advised at all times of any member of the Supplier Staff who, subsequent to their commencement of employment as a member of the Supplier Staff receives a Conviction or whose previous Convictions become known to the Supplier or whose conduct or records indicate that they are not suitable to carry out any regulated activities as defined by the Safeguarding Vulnerable Groups Act 2006 or may present a risk to Students or any other person. The Supplier shall only be entitled to continue to engage or employ such individual with the

Authority's written consent and with such safeguards being put in place as the Authority may reasonably request. Should the Authority withhold consent the Supplier shall immediately remove such individual from the Supplier Staff.

2.7 The Supplier shall immediately provide to the Authority any information that the Authority reasonably requests to enable the Authority to satisfy itself that the obligations set out in paragraphs 2.1 to 2.6 of this Schedule have been met.

2.8 For Supplier Staff appointed following the Effective Date who shall or may have access to IfATE Data, in addition to meeting its obligations under this paragraph 2, the Supplier shall carry out pre-employment screening meeting the HMG Baseline Personnel Security Standard (BPSS) or equivalent in accordance with Schedule 9 (*Data Handling and Security Management*).

Annex to Schedule 7
List of Key Personnel

The content for this Schedule is as below:

GEN2 W2 Science List of Key Personnel

Schedule 8

Supply Chain (including approved Subcontractors)

1 Appointment of Key Subcontractors

1.1 Where the Supplier wishes to enter into a Key Sub-Contract or replace a Key Subcontractor, it must obtain Approval, such Approval not to be unreasonably withheld or delayed. For these purposes, the Authority may withhold its Approval to the appointment of a Key Subcontractor if it reasonably considers that:

1.1.1 the appointment of a proposed Key Subcontractor may prejudice the provision of the Services and/or the supply of the Products or may be contrary to the interests of the Authority and/or the TQ;

1.1.2 the proposed Key Subcontractor is unreliable and/or has not provided reasonable services to its other customers or clients;

1.1.3 the proposed Key Subcontractor employs unfit persons; or

1.1.4 the proposed Key Subcontractor should be excluded in accordance with clause 15.8 (*Ending or extending this Contract*).

1.2 The Authority confirms its Approval of the appointment of the Key Subcontractors listed in Annex 1 to this Schedule 8.

1.3 Except where the Authority has given its Approval otherwise, the Supplier shall ensure that each Key Sub-Contract shall include:

1.3.1 provisions which will enable the Supplier to discharge its obligations under this Contract;

1.3.2 a right for the Authority to enforce any provisions under the Key Sub-Contract which are capable of conferring a benefit upon the Authority;

1.3.3 a provision enabling the Authority to enforce the Key Sub-contract as if it were the Supplier;

1.3.4 a provision enabling the Supplier to assign, novate or otherwise transfer any of its rights and/or obligations under the Key Sub-Contract to the

Authority or any Replacement Supplier without restriction (including any need to obtain any consent or approval) or payment by the Authority; and

1.3.5 obligations no less onerous on the Key Subcontractor than those imposed on the Supplier under this Contract:

(i) under clauses 18.1 to 18.9.4 (*Data protection and information*);

(ii) under clause 20 (*When information can be shared*);

(iii) in respect of any obligation not to bring the Authority, the Department or the ESFA and/or the T Levels Programme into disrepute and/or otherwise diminish the trust that the public places in the Authority, the Department or the ESFA, as set out in clause 3.1.9 (*How the Services must be supplied*); and

(iv) in respect of the keeping of records and provision of information (including (as applicable) Management Information) in relation to that part of the Services being provided and/or those Products being supplied under the Key Sub-Contract.

1.4 The Supplier shall, as soon as reasonably practicable following a request by the Authority, provide a copy of any proposed Key Sub-Contract (and/or any Key Sub-Contract which it has entered into) to demonstrate compliance by the Supplier with its obligations under this paragraph 1.

2 <u>Subcontractor information</u>

2.1 If the Authority asks the Supplier for details about Subcontractors, the Supplier must provide details of Subcontractors at all levels of the supply chain including:

2.1.1 their name;

2.1.2 the scope of their appointment; and

2.1.3 the duration of their appointment.

Annex 1 to Schedule 8

Key Subcontractors

Not Applicable

Schedule 9

Data Handling and Security Management

1 The Supplier shall maintain Cyber Essentials certification and shall operate an Information Security Management System in relation to the Services that is compliant with ISO 27001 (the International Standard for Information Security Management Systems) or an equivalent standard.

2 The Supplier shall have in place and maintain physical security, in line with the requirements outlined in ISO 27002 (the International Standard describing the Code of Practice for Information Security Controls), including entry control mechanisms (e.g. door access) to premises and sensitive areas.

3 The Supplier shall have in place and maintain an access control policy and process for the logical access (e.g. identification and authentication) to IT systems to ensure only authorised personnel have access to IfATE Data.

4 The Supplier shall have in place and shall maintain procedural, personnel, physical and technical safeguards to protect IfATE Data, including: physical security controls; Good Industry Practice policies and processes; anti-virus and firewalls; security updates and up-to-date patching regimes for anti-virus solutions, operating systems, network devices and application software; user access controls; and the creation and retention of audit logs of system use.

5 The Supplier shall carry out and shall maintain records of appropriate technical risk assessments in respect of all aspects of the Supplier's handling of IfATE Data. The Supplier shall provide such records to the Authority on request and shall ensure that such records are capable of demonstrating to the Authority's reasonable satisfaction that appropriate procedures are in place to address any significant risks identified.

6 The Supplier shall ensure that IfATE Data is processed and stored in a manner which enables such IfATE Data to be identified and securely deleted when required. The Supplier shall ensure that IfATE Data which is not in electronic form is kept physically separate from the data of the Supplier and any of the Supplier's other customers.

7 Any IfATE Data transferred by the Supplier using electronic transfer methods across public space or cyberspace, including mail and courier systems, or third party provider networks must be encrypted to an encryption standard meeting Transport Layer Security (TLS) 1.2 or later.

8 Storage of IfATE Data on any portable devices or media shall be limited to the absolute minimum required to deliver the stated requirement and shall be subject to paragraphs 9 and 10 below.

9 Any portable removable media (including pen drives, flash drives, memory sticks, CDs, DVDs, or other devices) which handle, store or process IfATE Data to deliver or support the Services, shall be under the control and configuration management of the Supplier, shall be necessary to deliver the Services and shall be encrypted to the Advanced Encryption Standard (AES) 256 or equivalent.

10 All portable IT devices (including laptops, tablets, smartphones or other devices, such as smart watches) which handle, store or process IfATE Data to deliver and support the Services, shall be under the control and configuration management of the Supplier, shall be necessary to deliver the Services and shall be full-disk encrypted to the Advanced Encryption Standard (AES) 256 or equivalent.

11 Whilst in the Supplier's care, all removable media and hardcopy paper documents containing IfATE Data must be handled securely and secured under lock and key when not in use and shall be securely destroyed when no longer required, using either a cross-cut shredder, a professional secure disposal organisation or an equivalent secure disposal method.

12 When necessary to hand-carry removable media and/or hardcopy paper documents containing IfATE Data, the media or documents being carried shall be kept under cover and transported in such a way as to ensure that no unauthorised person has either visual or physical access to the material being carried. This paragraph shall apply equally regardless of whether the material is being carried inside or outside of the Supplier's premises.

13 The Supplier shall ensure throughout the Term that it is in a position (and is able to demonstrate to the Authority's reasonable satisfaction that it is in a position) to provide a complete copy of all IfATE Data at the Authority's request at any time and on the termination or expiry of the Contract.

14 At the end of the Contract or in the event of equipment failure or obsolescence, all IfATE Data, in either hardcopy or electronic format, that is physically held or logically stored on the Supplier's IT infrastructure must be securely sanitised or destroyed and accounted for in a manner that ensures that the relevant data is not retrievable using normally available methods and/or tools and which allows the Supplier to demonstrate

its compliance with this paragraph 14 at the Authority's request. Where sanitisation or destruction is not possible for legal, regulatory or technical reasons, then the Supplier shall protect the Authority's information and data until such time that it can be securely cleansed or destroyed.

15 Access by Supplier Staff to IfATE Data shall be confined to those individuals who have a "need-to-know" in order to carry out their role and have undergone pre-employment screening appropriate to the nature and sensitivity of the IfATE Data and, for Supplier Staff appointed following the Effective Date, have undergone pre-employment screening which is at least equivalent to the HMG Baseline Personnel Security Standard (BPSS).

16 All Supplier Staff who handle IfATE Data must have annual awareness training in protecting information.

17 The Supplier shall have in place robust business continuity arrangements and processes including IT disaster recovery plans and procedures to ensure that the delivery of the Services is not adversely affected in the event of an incident (as set out in the Supplier's Business Continuity Plan). An incident shall be defined as any situation that might, or could lead to, a disruption, loss, emergency or crisis to the Services. Upon request from the Authority, the Supplier will provide evidence of the effectiveness of their business continuity arrangements and processes including IT disaster recovery plans and procedures. This should include evidence that the Supplier has tested or exercised these plans within the last 12 months and produced a written report of the outcome, including required actions.

18 Any suspected or actual breach of the confidentiality, integrity or availability of IfATE Data being handled in the course of providing the Services, or any non-compliance with security standards pertaining to the Services, shall be investigated immediately and escalated to the Authority. The Supplier shall maintain audit records and event logs in respect of any such security events in accordance with documented retention policies approved by the Authority.

19 The Supplier shall ensure that any IT systems and hosting environments that are used to handle, store or process IfATE Data shall be subject to independent penetration testing, to take place within the three month period immediately prior to the start of each Academic Year, to test the security of such systems and hosting environments, by a penetration testing provider that is CHECK, CREST or TIGER scheme approved.

The Supplier shall include a summary of the findings of such penetration testing and the details of any necessary remedial work carried out in the annual penetration testing report required under Schedule 2 (*Service Requirements*). In the event of security issues being identified which are ranked as "high" importance or above, the Supplier shall notify the Authority as soon as reasonably possible (and in any event within 2 Working Days), shall promptly remedy such issues, and shall promptly carry out a follow-up remediation test at the Authority's request.

20 The Supplier shall ensure that any consumer-off-the-shelf software used in relation to the IfATE Data or otherwise to deliver the Services is kept up-to-date and subject to mainstream support.

21 The Supplier shall procure and implement security patches to address any vulnerabilities in the IT systems used to handle the IfATE Data or to deliver the Services, within a period of time appropriate to the risk the vulnerability presents.

22 The Supplier shall not without the prior written agreement of the Authority store any IfATE Data outside of the UK or perform any form of IT management, support or development function from outside the UK. The Supplier shall provide the Authority with full details of any proposal to do so and shall not go ahead with any such proposal without the prior written agreement of the Authority.

23 The Supplier shall undergo appropriate security assurance activities as may reasonably be determined by the Authority from time to time and shall support the provision of appropriate evidence of assurance and the production of the necessary security documentation. This will include obtaining any necessary professional security resources required to support the Supplier's security assurance activities.

24 The Supplier shall have in place and maintain a secure system for data exchange sufficient to enable the Supplier to make all required Management Information and Ofqual information returns in relation to the TQ and the Services.

25 Unless otherwise agreed in writing by the Authority, the Supplier shall ensure that any of their Subcontractors, third party suppliers or partners (including any Assessor who is self-employed or who provides services to the Supplier through that Assessor's own personal service company) who could potentially access any IfATE Data meet all of the requirements in this Schedule as they apply to the Supplier and shall contractually enforce such requirements onto any such Subcontractors, third party suppliers or

partners (including any Assessor who is self-employed or who provides services to the Supplier through that Assessor’s own personal service company).

Schedule 10

Business Continuity

The content for this Schedule is as below:

GEN2 W2 Science Business Continuity

Schedule 11

Change Management

Variation Form

Variation Form / change control note (CCN) No:	**Contract:**	**Effective Date of Variation:**
Initiated by: Change requested by [Supplier **OR** Authority]		
Date of request:		
Period of validity: This Variation Form is valid for acceptance until [DATE].		
Reason for change:		
Description and impact of the change (including to delivery and performance):		
Time limit for Impact Assessment:		
Required amendments to wording of Contract or Schedules:		
Adjustment to Charges resulting from change:		
Supporting or additional information:		

SIGNED ON BEHALF OF THE AUTHORITY	**SIGNED ON BEHALF OF THE SUPPLIER**
Signature:	Signature:
Name:	Name:
Position:	Position:
Date:	Date:

Schedule 12

Exit Management

PART A: GENERAL

1 **Exit Plan**

1.1 The Supplier shall, within two Months after the Effective Date, deliver to the Authority an initial Exit Plan (adopting and updating the form of plan at Annex 1 to this Schedule 12) that:

1.1.1 sets out the Supplier's proposed methodology for achieving an orderly transfer of the Services to the Authority and/or its Replacement Supplier on the expiry or termination of this Contract;

1.1.2 complies with the requirements set out in paragraph 1.3 below; and

1.1.3 is otherwise reasonably satisfactory to the Authority.

1.2 The Authority shall consider the initial Exit Plan and shall notify the Supplier of any amendments it believes are necessary. The Parties shall use reasonable endeavours to agree the contents of the Exit Plan. If the Parties are unable to agree the contents of the Exit Plan within 30 Working Days of the Authority requesting any amendments, then such Dispute shall be resolved in accordance with the Dispute Resolution Procedure.

1.3 The Exit Plan shall set out, as a minimum:

1.3.1 how the Exit Information will be obtained;

1.3.2 separate mechanisms for dealing with Ordinary Exit, Early Exit and Emergency Exit, with the provisions relating to Early Exit and Emergency Exit prepared on the assumption that the Supplier may be unable to provide the full level of assistance that is required by the provisions relating to Ordinary Exit, and to include in the case of Early Exit and Emergency Exit, provision for the supply by the Supplier of all such reasonable assistance as the Authority shall require to enable the Authority or its sub-contractors to provide the Services;

1.3.3 the management structure to be employed during the transfer of the Services in the event of each of an Ordinary Exit, an Early Exit and an Emergency Exit;

1.3.4 a detailed description of the transfer processes, including a timetable, applicable in the case of each of an Ordinary Exit, an Early Exit and an Emergency Exit;

1.3.5 steps the Supplier will take to mitigate the potential for and/or costs of any redundancies (if applicable) of any individual employed by either the Supplier or any Subcontractor in the provision of the Services in the event of each of an Ordinary Exit, an Early Exit and an Emergency Exit; and

1.3.6 without prejudice to the Supplier's obligations elsewhere in this Schedule, the scope of any further termination-related assistance that may reasonably be required by the Authority to achieve an orderly transfer of the Services to the Authority and/or its Replacement Supplier in the case of each of an Ordinary Exit, an Early Exit, and an Emergency Exit.

2 Updates to the Exit Plan

2.1 The Supplier shall review and (if appropriate) update the Exit Plan:

2.1.1 following IfATE Approval;

2.1.2 at least once every Academic Year;

2.1.3 whenever there is a material change to the Services (including any TQ Change); and

2.1.4 within 10 Working Days of the service of a Termination Notice,

and consider what changes (if any) are necessary to reflect the current state of the Services and the TQ at the relevant point in time and to ensure that the Exit Plan meets the requirements of this Schedule and is capable of being implemented promptly.

2.2 Following each review required under paragraph 2.1, the Supplier shall submit for the Authority's approval a revised draft of the Exit Plan showing any proposed amendments necessary to ensure the Exit Plan continues to meet the requirements of this Schedule. The Authority shall consider each such revised draft and shall notify the Supplier of any further amendments it believes are necessary. The Supplier shall incorporate all reasonable amendments requested by the Authority in a further revised draft of the Exit Plan. If the Parties are unable to agree the contents of a revised Exit

Plan within 30 Working Days of the Authority requesting any amendments, then such Dispute shall be resolved in accordance with the Dispute Resolution Procedure.

2.3 When the revised Exit Plan is agreed, it shall be signed by both Parties, following which it shall supersede any previous versions of the Exit Plan.

3 Provision of Exit Information

3.1 The Supplier shall provide to the Authority the Exit Information (as defined in paragraph 3.2 below) in an appropriate documentary form:

3.1.1 within one Month of the date 12 Months prior to the Expiry Date (as extended by any Extension Period);

3.1.2 as soon as reasonably practicable after (and in any event within one Month of) the date of service of a Termination Notice by either Party; and

3.1.3 at the Authority's request on reasonable notice at any point during the Term provided that the Authority shall not make such a request more than twice in any 6 month period.

3.2 Subject to paragraph 3.3, the information to be provided under paragraph 3.1 shall include all such information as is reasonably necessary and sufficient to enable the Authority and/or any Replacement Supplier to take over and provide the Services and the TQ following the expiry or termination of this Contract (the "**Exit Information**"), and in particular shall include:

3.2.1 details of all Supplier third party contracts or licences used for the provision of the Services (including any Transferable Contracts) including, where applicable, whether such contracts or licences are used by the Supplier to provide services to other customers of the Supplier, save to the extent these details are subject to an obligation of confidence to a third party that is not part of the Supplier's corporate group;

3.2.2 details of all the Intellectual Property Rights used in the provision of the Services or developed as part of the Services;

3.2.3 details of any IfATE Data that is in the possession or control of the Supplier or any Subcontractors or that is otherwise used in the provision of the Services;

3.2.4 details of any Key Materials and Ancillary Materials;

3.2.5 details of any ongoing projects or other work carried out under this Contract; and

3.2.6 in respect of all individuals engaged in providing the Services, such information as the Authority may reasonably request (subject, at all times, to any relevant Data Protection Legislation), including in an anonymised format full and accurate details of:

(i) the total number of such individuals;

(ii) details of whether they are employed, self-employed contractors or consultants, agency workers or otherwise;

(iii) their dates of commencement of employment or engagement;

(iv) their remuneration and other benefits;

(v) their other terms and conditions of employment, as applicable (including their relevant contractual notice periods and any other terms relating to termination of employment, redundancy procedures and redundancy payments);

(vi) their job titles and job descriptions;

(vii) details of any such individuals on long term sickness absence, parental leave, maternity leave, paternity leave or other authorised long-term absence;

(viii) any outstanding or potential contractual, statutory or other liabilities in respect of such individuals (including in respect of personal injury claims);

(ix) details of who reports to each individual and to whom each individual reports; and

(x) any collective agreements that apply to them; and

3.2.7 any other material or information reasonably requested by the Authority.

3.3 The Supplier shall not be required to provide in the Exit Information any information that has already been provided to the Authority as part of the Management Information, unless that information has become outdated and/or inaccurate since it was last provided as part of the Management Information.

3.4 Once provided in accordance with paragraph 3.1 above, the Supplier shall provide any updates to the Exit Information to the Authority:

3.4.1 on a Monthly basis (following any Month where there are changes to the Exit Information) following the earliest of the dates referred in to paragraphs 3.1.1 and 3.1.2; and

3.4.2 as soon as reasonably practicable following (and in any case within one Month of) the Authority's reasonable request, provided that the Authority shall not make such a request more than twice in any 6 Month period.

3.5 The Exit Information shall be deemed to be Confidential Information. The Authority shall only use the Exit Information for the Exit Purposes as defined in paragraph 4.2 below, and shall ensure that such Exit Information is only disclosed within the Authority to those individuals who need to know the Exit Information for the Exit Purposes. The Authority may disclose the Exit Information to any Replacement Supplier for the Exit Purposes.

4 Provision of assistance on termination or expiry

4.1 In connection with any expiry or termination of this Contract for whatever reason, the Parties shall perform their respective obligations as stated in the Exit Plan, and without prejudice to the generality of this obligation:

4.1.1 the Supplier shall provide to the Authority and/or any Replacement Supplier (as applicable) all reasonable assistance requested by the Authority for the transfer of the Services and the TQ from the Supplier to the Authority and/or the Replacement Supplier (as applicable) with the minimum of disruption and inconvenience to Students and Stakeholders;

4.1.2 the Supplier shall provide the Authority with:

(i) a complete copy of all Key Materials;

(ii) a complete copy of any Ancillary Materials that have not previously been provided or that have been updated since they were last provided; and

(iii) at the Authority's request, further copies of any Ancillary Materials previously provided;

4.1.3 the Supplier shall provide the Authority or, at the Authority's request, any Replacement Supplier, with a copy of all IfATE Data that is in the possession or control of the Supplier or any Subcontractors or that is otherwise used in the provision of the Services;

4.1.4 the Supplier shall provide any additional information reasonably required by the Authority to understand and access any data or information provided by the Supplier; and

4.1.5 at the Authority's request, the Supplier shall enter into a period of parallel running of the Services alongside the running of any Replacement Services and shall use its reasonable endeavours to facilitate a phased transfer of the Services to the Authority and/or any Replacement Supplier (but only where that phased transfer does not impact on the Supplier's ability to deliver the Services that it remains responsible for providing under this Contract).

4.2 Without prejudice to the terms of clause 13 (*Intellectual Property Rights*), the Supplier hereby grants to the Authority a worldwide, royalty free licence (with a right to sublicense to any Replacement Supplier) to use any information, data, software or materials referred to in the Exit Information or provided by the Supplier or its Subcontractors in the performance of the Supplier's obligations under this paragraph 4. The Authority and any Replacement Supplier sub-licensees may only use such information, data, software and materials for such purposes and for such period as is reasonably necessary to ensure an orderly transfer of the Services to the Authority or a Replacement Supplier that minimises disruption and inconvenience to Students and Stakeholders ("**Exit Purposes**").

4.3 In the event of an Emergency Exit, the Supplier shall grant or procure the grant to the Authority and any Replacement Supplier the right during any Transition Period and on termination of this Contract to access and use the IT systems used by the Supplier (including software and databases) insofar as such access and use is necessary in order to enable an orderly transfer of the Services to the Authority and/or its

Replacement Supplier on the termination of this Contract, and the Supplier shall provide such access, information and credentials as are required for the Authority and/or Replacement Supplier to access such systems for such purposes.

5 Transferable Contracts

5.1 During the period beginning 6 Months prior to the End Date or following the service of a Termination Notice by either party, the Supplier shall not without the Authority's prior written consent terminate, enter into or vary:

5.1.1 Transferable Contract; or

5.1.2 any other Sub-Contract, except to the extent such change does not or will not affect the provision of the Services or the Charges.

5.2 On expiry or termination of this Contract for any reason, the Supplier shall at the Authority's request assign, novate or procure the novation of the Supplier's interest in the Transferable Contracts to the Authority or a Replacement Supplier.

6 Costs of assistance on termination or expiry

6.1 Save in respect of the provision of the Services (for which the Supplier shall continue to be remunerated in accordance with Schedule 6 (*Pricing Schedule*)):

6.1.1 where the Contract is terminated by the Authority as a result of a Supplier Termination Event under clause 15.3 (*Ending or extending this Contract*) or where the Contract is wrongfully terminated or repudiated by the Supplier, the Parties' costs of compliance with paragraph 4 shall be borne by the Supplier; and

6.1.2 where the Contract is terminated by the Supplier under clause 15.5 (*Ending or extending this Contract*) or where the Contract is wrongfully terminated or repudiated by the Authority, the Parties' costs of compliance with paragraph 4 shall be borne by the Authority.

6.2 References to "**costs**" in paragraph 6.1 shall be deemed to refer only to direct, reasonable and verifiable costs (which, in the case of the Supplier, shall be calculated in accordance with the Rate Card). Both Parties shall use all reasonable endeavours to mitigate such costs and, to the extent reasonably practicable, each Party shall notify

and obtain the consent of the other Party before incurring any costs for which the other Party would be liable under paragraph 6.1.

6.3 Subject to paragraph 6.1, each Party shall bear its own costs of compliance with this Schedule.

7 General

7.1 The Supplier warrants to the Authority that all the information provided under paragraphs 3 and 4 shall conform to the requirements of this Contract or, where there are no such requirements, shall be prepared in accordance with Good Industry Practice.

7.2 Except as otherwise stated in the Exit Plan:

7.2.1 the obligations in paragraphs 4 and 5 shall be in addition to, and not in substitution for, the provision of the Services; and

7.2.2 subject to the continued payment of the Charges in accordance with the terms of this Contract, the Supplier shall continue to provide, and the Authority shall continue to receive, the Services during the Term in accordance with the terms and conditions of this Contract.

PART B: EMPLOYMENT

8 Employment exit provisions

8.1 This Contract envisages that subsequent to its commencement, the identity of the provider of the Services (or any part of the Services) may change (whether as a result of termination of this Contract, or part or otherwise) resulting in a transfer of the Services in whole or in part ("**Subsequent Transfer**"). If a Subsequent Transfer is a Relevant Transfer, then the Authority or Replacement Supplier will inherit liabilities in respect of the Relevant Employees with effect from the Relevant Transfer Date.

8.2 The Supplier shall and shall procure that any Subcontractor shall on receiving notice of termination of this Contract or otherwise, on request from the Authority and at such times as required by TUPE, provide in respect of any person engaged or employed by the Supplier or any Subcontractor in the provision of the Services, the Supplier's Provisional Supplier Personnel List and the Staffing Information together with any

additional information required by the Authority, including information as to the application of TUPE to each individual listed on the Supplier's Provisional Supplier Personnel List. The Supplier shall notify the Authority of any material changes to this information as and when they occur.

8.3 At least 28 days prior to the Relevant Transfer Date, the Supplier shall and shall procure that any Subcontractor shall prepare and provide to the Authority and/or, at the direction of the Authority, to the Replacement Supplier, the Supplier's Final Supplier Personnel List, which shall be complete and accurate in all material respects. The Supplier's Final Supplier Personnel List shall identify which of the Supplier's and Subcontractor's personnel named are Relevant Employees.

8.4 The Authority shall be permitted to use and disclose the Supplier's Provisional Supplier Personnel List, the Supplier's Final Supplier Personnel List and the Staffing Information for informing any tenderer or other prospective Replacement Supplier for any services that are substantially the same type of services as (or any part of) the Services.

8.5 The Supplier warrants to the Authority and the Replacement Supplier that the Supplier's Provisional Supplier Personnel List, the Supplier's Final Supplier Personnel List and the Staffing Information ("**TUPE Information**") will be true and accurate in all material respects and that no persons are employed or engaged in the provision of the Services other than those included on the Supplier's Final Supplier Personnel List.

8.6 The Supplier shall and shall procure that any Subcontractor shall ensure at all times that it has the right to provide the TUPE Information under Data Protection Legislation.

8.7 Any change to the TUPE Information which would increase the total employment costs of the staff in the 12 months prior to the Expiry Date and/or the period following the date of service of a Termination Notice by either Party, shall not (so far as reasonably practicable) take place without the Authority's prior written consent, unless such changes are required by law. The Supplier shall and shall procure that any Subcontractor shall supply to the Authority full particulars of such proposed changes and the Authority shall be afforded reasonable time to consider them.

8.8 In the 12 months prior to the Expiry Date and the period following the date of service of a Termination Notice by either Party, the Supplier shall not and shall procure that any Subcontractor shall not materially increase or decrease the total number of staff listed on the Supplier's Provisional Supplier Personnel List, their remuneration, or

make any other change in the terms and conditions of those employees without the Authority's prior written consent.

8.9 The Supplier shall be responsible for all remuneration, benefits, entitlements and outgoings in respect of the Supplier's Personnel, including without limitation, all wages, holiday pay, bonuses, commissions, payments of PAYE, National Insurance, pension contributions and otherwise, up to the Relevant Transfer Date.

8.10 The Supplier shall indemnify and keep indemnified in full the Authority and at the Authority's request each and every Replacement Supplier against all Employee Liabilities relating to:

8.10.1 any person who is or has been employed or engaged by the Supplier or any Subcontractor in connection with the provision of any of the Services; or

8.10.2 any trade union or staff association or employee representative,

arising from or connected with any failure by the Supplier and/or any Subcontractor to comply with any legal obligation, and whether any such claim arises or has its origin before or after the Relevant Transfer Date.

8.11 The Authority will and/or shall ensure that any Replacement Supplier will indemnify and keep indemnified in full the Supplier against any liability to the extent only arising from any failure by the Authority and/or any Replacement Supplier to comply with their obligations under TUPE.

8.12 The parties shall co-operate to ensure that any requirement to inform and consult with the employees and or employee representatives in relation to any Relevant Transfer as a consequence of a Subsequent Transfer will be fulfilled.

8.13 The parties agree that the Contracts (Rights of Third Parties) Act 1999 shall apply in respect of paragraph 8.2 to paragraph 8.10 to the extent necessary to ensure that any Replacement Supplier shall have the right to enforce the obligations owed to, and indemnities given to, the Replacement Supplier by the Supplier or the Authority in its own right under the Contracts (Rights of Third Parties) Act 1999.

8.14 Despite paragraph 8.13, it is expressly agreed that the parties may by agreement rescind or vary any terms of this Contract without the consent of any other person who has the right to enforce its terms or the term in question despite that such rescission or variation may extinguish or alter that person's entitlement under that right.

Schedule 12: Annex 1

Exit and Entry Transition Plan

The content for this Annex is contained in a separate file at:

1. **GEN2 W2 Science Q10.4 Exit Plan**
2. **GEN2 W2 Science Q10.4 Entry Transition Plan**

Schedule 12 Annex 1

Exit Plan

Schedule 12 Annex 1

Entry Transition Plan

Schedule 13

Form of Guarantee

Not Applicable

Schedule 14

Intellectual Property Assignment and Licence

DATED

THE INSTITUTE FOR APPRENTICESHIPS AND TECHNICAL EDUCATION

and

[*Supplier*]

INTELLECTUAL PROPERTY ASSIGNMENT AND LICENCE IN RELATION TO THE [xxx] T LEVEL TECHNICAL QUALIFICATION

[***DN: The highlighted details above are to be completed at the Contract award stage***]

THIS ASSIGNMENT AND LICENCE is made on

BETWEEN:

(1) **THE INSTITUTE FOR APPRENTICESHIPS AND TECHNICAL EDUCATION** of Sanctuary Buildings, 20 Great Smith Street, London SW1P 3BT ("**Authority**"); and

(2) **[*DN: Insert Supplier name and details at Contract award stage*]** ("**Supplier**"), each a "**Party**" and together the "**Parties**".

BACKGROUND TO THIS ASSIGNMENT AND LICENCE

(A) The Authority and the Supplier have entered into a contract on the date of this Assignment and Licence for the design, development and delivery of the technical education qualification element ("**TQ**") for the [*DN: Relevant pathway to be inserted at Contract award stage*] T Level ("the **TQ Agreement**").

(B) The Supplier has agreed to assign certain intellectual property rights to the Authority, and to licence certain intellectual property rights to the Authority in connection with the TQ. The Authority has agreed to grant a licence back to the Supplier in relation to certain assigned intellectual property rights.

(C) This Assignment and Licence, together with the TQ Agreement sets out the agreed terms of such assignment and licences.

1 Assignment and Licence start, formation and interpretation

1.1 This Assignment and Licence is legally binding from the Effective Date until it ends in accordance with its terms.

1.2 In this Assignment and Licence, unless the context otherwise requires, capitalised expressions shall have the meanings set out in this clause 1 or, where no definition is given in this clause 1, Schedule 1 to the TQ Agreement.

1.3 If a capitalised expression does not have an interpretation in this clause 1 or Schedule 1 to the TQ Agreement, it shall, in the first instance, be interpreted in accordance with the common interpretation within the relevant market sector where appropriate. Otherwise, it shall be interpreted in accordance with the dictionary meaning.

1.4 In this Assignment and Licence, unless the context otherwise requires:

1.4.1 the singular includes the plural and vice versa;

1.4.2 reference to a gender includes the other gender and the neuter;

1.4.3 references to a person include an individual, company, body corporate, Corporation, unincorporated association, firm, partnership or other legal entity or Crown Body;

1.4.4 references to a legal entity (other than the Supplier) shall include unless otherwise expressly stated any statutory successor to such entity and/or the relevant functions of such entity, and references to the Department shall include, where relevant, the ESFA;

1.4.5 a reference to any Law includes a reference to that Law as amended, extended, consolidated or re-enacted from time to time;

1.4.6 the words "**including**", "**other**", "**in particular**", "**for example**" and similar words shall not limit the generality of the preceding words and shall be construed as if they were immediately followed by the words "**without limitation**";

1.4.7 references to **"writing"** include typing, printing, lithography, photography, display on a screen, electronic and facsimile transmission and other modes of representing or reproducing words in a visible form, and expressions referring to writing shall be construed accordingly;

1.4.8 references to **"clauses"** and **"Schedules"** are, unless otherwise provided, references to the clauses and schedules of the Assignment and Licence and references in any Schedule to parts, paragraphs, annexes and tables are, unless otherwise provided, references to the parts, paragraphs, annexes and tables of the Schedule in which these references appear;

1.4.9 references to **"paragraphs"** are, unless otherwise provided, references to the paragraph of the appropriate Schedule unless otherwise provided; and

1.4.10 the headings in the Assignment and Licence are for ease of reference only and shall not affect the interpretation or construction of this Agreement and Licence.

1.5 In this Assignment and Licence, unless the context otherwise requires, the following words shall have the following meanings:

"**Ancillary Materials**" means all information and materials (other than Key Materials) to which the Authority and/or a Future Supplier would require access for the Portability Purposes, and any other materials which would be required on or to facilitate succession to a Future Supplier in a seamless manner in relation to the TQ offered or Operated by the Supplier.

Ancillary Materials shall include, without limitation:

(a) Student results including grades;

(b) statistical analysis for grading (excludes the systems supporting the analysis);

(c) lists of Providers;

(d) marked Student evidence (with moderation outcomes);

(e) documentation which provides an overview or analysis of Student performance (including chief examiner and chief moderator reports), which include but are not limited to, examples of student responses to assessment questions and/or tasks as well as narrative explaining why students did well/ less well on individual items/ components/ subcomponents);

(f) data on Student credits;

(g) data on Student appeals;

(h) data on special considerations for Students;

(i) the Assessment Strategy;

(j) Student registrations;

(k) draft materials in preparation for forthcoming assessments;

(l) the Key Dates Schedule (in respect of forthcoming assessments);

(m) lists, with contact details, of people contracted by the Supplier to perform or oversee activities which are necessary for the conduct and quality assurance of assessments for the TQ;

(n) materials from completed assessments, such as completed Students' examination answer booklets; and

(o) TQ Live Assessment Materials

"**Approval**" has the same meaning as in the TQ Agreement;

"**Assigned Rights**" means the Intellectual Property Rights in the Key Materials;

"**Authority Authorised Representative**" has the same meaning as in the TQ Agreement;

"**Background IPR**" means any IPR owned by a Party prior to the Effective Date or created or developed by a Party otherwise than in the provision of the Services or under or in connection with the TQ Agreement, but does not include IPR in Key Materials;

"**Beneficiary**" means a Party having (or claiming to have) the benefit of an indemnity under this Assignment and Licence;

"**Claim**" means any claim for which it appears that a Beneficiary is, or may become, entitled to indemnification under this Assignment and Licence;

"**Continuing Activities**" means activities of the Supplier under the TQ Agreement which continue following the end of the second Academic Year for the final Exclusive Cohort (each as defined in the TQ Agreement) in relation to the TQ as offered by the Supplier, such as retakes, appeals, and any ongoing records management contracted to the Supplier;

"**Default**" means any breach of the obligations of the Supplier (including abandonment of the Assignment and Licence in breach of its terms) or any other default (including material default), act, omission, negligence or statement of the Supplier, of its Subcontractors or any Supplier Staff howsoever arising in connection with or in relation to the subject-matter of this Assignment and Licence and in respect of which the Supplier is liable to the Authority;

"**Deliverables**" means all information and data the Supplier creates, identifies for use, or uses as part of or for the Operation of the TQ, including Products and Management Information;

"**Dispute**" means any claim, dispute or difference which arises out of or in connection with this Assignment and Licence or in connection with the negotiation, existence, legal validity, enforceability or termination of this Assignment and Licence, whether the alleged liability shall arise under English law or under the law of some other country and regardless of whether a particular cause of action may successfully be brought in the English courts;

"**Effective Date**" means the date on which the last Party to sign has signed this Assignment and Licence;

"**Final Approval Milestone**" has the meaning given in the TQ Agreement;

"**Future Supplier**" means any Awarding Organisation appointed, at any point in the future and including any Replacement Supplier, to operate one or more T Level technical education qualifications by or at the direction of the Authority from time to time, and where the Authority is operating a T Level technical education qualification, shall also include the Authority;

"**Indemnifier**" means a Party from whom an indemnity is sought under this Assignment and Licence;

"**Insolvency Event**" means:

(a) in respect of a company:

(i) a proposal is made for a voluntary arrangement within Part I of the Insolvency Act 1986 or of any other composition scheme or arrangement with, or assignment for the benefit of, its creditors; or

(ii) a shareholders' meeting is convened for the purpose of considering a resolution that it be wound up or a resolution for its winding-up is passed (other than as part of, and exclusively for the purpose of, a bona fide reconstruction or amalgamation); or

(iii) a petition is presented for its winding up (which is not dismissed within fourteen (14) Working Days of its service) or an application is made for the appointment of a provisional liquidator or a creditors' meeting is convened pursuant to section 98 of the Insolvency Act 1986; or

(iv) a receiver, administrative receiver or similar officer is appointed over the whole or any part of its business or assets; or

(v) an application order is made either for the appointment of an administrator or for an administration order, an administrator is appointed, or notice of intention to appoint an administrator is given; or

(vi) it is or becomes insolvent within the meaning of section 123 of the Insolvency Act 1986; or

(vii) being a "**small company**" within the meaning of section 382(3) of the Companies Act 2006, a moratorium comes into force pursuant to Schedule A1 of the Insolvency Act 1986; or

(b) where the person is an individual or partnership, any event analogous to those listed in limbs (a) (i) to (vii) (inclusive) occurs in relation to that individual or partnership; or

(c) any event analogous to those listed in limbs (a) (i) to (vii) (inclusive) occurs under the law of any other jurisdiction;

"**Intellectual Property Rights**" or "**IPR**" means:

(a) copyright, rights related to or affording protection similar to copyright, rights in databases, patents and rights in inventions, semi-conductor topography rights, trade marks, rights in internet domain names and website addresses and other rights in trade or business names, goodwill, designs, Know-How, trade secrets and other rights in Confidential Information;

(b) applications for registration, and the right to apply for registration, for any of the rights listed at (a) that are capable of being registered in any country or jurisdiction; and

(c) all other rights having equivalent or similar effect in any country or jurisdiction;

"**IPR Claim**" means any claim of infringement or alleged infringement (including the defence of such infringement or alleged infringement) of any IPR used to provide the Services and/or supply the Products or otherwise provided and/or licensed by the Supplier (or to which the Supplier has provided access) to the Authority in the fulfilment of its obligations under the TQ Agreement or this Assignment and Licence;

"**Key Materials**" means materials the IPR in which the Authority reasonably requires ownership of for the Portability Purposes. Examples of where the Authority may reasonably require ownership include because the Authority or a Future Supplier (or, where relevant, a potential Future Supplier) may need to copy or otherwise reproduce such materials (in whole or in part), to supply or communicate the same, or to be able to control the use (in whole or in part) of such materials by third parties, or to authorise others to do so.

Key Materials shall include:

(a) specifications of content for each TQ including core and all specialist components;

(b) assessment guidelines (for Providers);

(c) quality assurance requirements (for Providers);

(d) specimen assessment materials;

(e) standards exemplification materials;

(f) supplementary specimen assessment materials

(g) employer set project guide exemplar responses

(h) employer set project grade exemplar responses

(i) updates or redevelopments of specifications of content;

(j) updates and redevelopments of any Key Materials; and

(k) any materials equivalent to the above to which a Skilled Future Supplier would reasonably require access for the Portability Purposes.

Key Materials shall not include:

(1) Support Materials, insofar as they are not part of any of the expressly included items listed above;

(2) question banks insofar as they are not part of any of the included items listed above and are not developed for the TQ; and

(3) any systems and platforms used to support the delivery of the TQ, provided that the relevant TQ content or data held in or processed by such systems and/or platforms can be extracted without requiring further processing post-extraction (and the Supplier can demonstrate that they can be so extracted) to enable use of the relevant content and/or data by a Skilled Future Supplier in conjunction with a non-proprietary or generally commercially available system or platform;

"**Know-How**" means all ideas, concepts, schemes, information, knowledge, techniques, methodology, and anything else in the nature of know-how relating to the Services;

"**Law**" means any law, subordinate legislation within the meaning of Section 21(1) of the Interpretation Act 1978, bye-law, enforceable right within the meaning of Section 2 of the European Communities Act 1972, regulation, order, regulatory policy, mandatory guidance or code of practice, judgment of a relevant court of law, or directives or requirements with which the Supplier is bound to comply;

"**Losses**" means all losses, liabilities, damages, costs, expenses (including legal fees), disbursements, costs of investigation, litigation, settlement, judgment, interest and penalties whether arising in contract, tort (including negligence), breach of statutory duty, misrepresentation or otherwise and "**Loss**" shall be interpreted accordingly;

"**New IPR**" means :

(b) IPR in items created by the Supplier (or by a third party on behalf of the Supplier) specifically for the purposes of the TQ Agreement and updates and amendments of these items including (but not limited to) database schema; and/or

(c) IPR in or arising as a result of the performance of the Supplier's obligations under the TQ Agreement and all updates and amendments to the same,

but shall not include any IPR owned by the Supplier prior to the Effective Date;

"**Operate**" in relation to a qualification means to provide the Services or a material part of the Services, or services replacing the Services or a material part of the Services, or of an equivalent character to the Services or a material part of the Services in relation to any other qualification (whether a T Level technical education qualification or not); and "**Operation**" and other cognate terms shall have a corresponding meaning;

"**Party**" means the Authority or the Supplier and "**Parties**" means both of them where the context permits;

"**Product**" has the meaning given in the TQ Agreement;

"**Provider**" means an organisation that has a grant agreement and/or a contract in place with the ESFA to provide qualifications to Students;

"**Replacement Services**" means any services which are substantially similar to any of the Services (including the supply of any Products) and which the Authority receives in substitution

for any of the Services, whether those services are provided by the Authority internally and/or by any third party;

"**Replacement Supplier**" has the meaning given in the TQ Agreement;

"**Required Insurances**" has the meaning given in the TQ Agreement;

"**Services**" means the services as described in Schedule 2 to the TQ Agreement (*Service Requirements*) including any Additional Services as defined in the TQ Agreement;

"**Termination Notice**" means a written notice of termination given by one Party to the other, notifying the Party receiving the notice of the intention of the Party giving the notice to terminate this Assignment and Licence on a specified date and setting out the grounds for termination;

"**Third Party IPR**" means Intellectual Property Rights owned by a third party which is or will be used by the Supplier for the purpose of providing the Services and/or supplying the Products;

"**TQ Agreement**" has the meaning given in recital A (above);

"**Transparent**" means that students and employers will regard the TQ delivered by a Future Supplier as materially the same as the TQ delivered and operated by the (existing) Supplier;

"**Working Day**" means any day other than a Saturday or Sunday or public holiday in England and Wales.

2 Assignment

2.1 Pursuant to and for the consideration set out in the TQ Agreement, the Supplier assigns to the Authority, absolutely with full title guarantee all its right, title and interest in and to all of the Intellectual Property Rights in the Key Materials (which, for the avoidance of doubt, includes the Guide Standard Exemplification Materials) including the right to bring, make, oppose, defend, appeal proceedings, claims or actions and obtain relief (and to retain any damages recovered) in respect of any infringement, or any other cause of action arising from ownership, of any of the Assigned Rights on or after the date of this Assignment and Licence. Such assignment shall take place on the earlier of:

2.1.1 the creation of any relevant materials known to be Key Materials;

2.1.2 the identification by the Supplier of the use of the relevant materials as part of the TQ; and

2.1.3 delivery of the relevant Key Materials to the Authority, or Operation of the TQ by the Supplier.

2.2 With the exception of Guide Standard Exemplification Materials, all Key Materials are relevant course documents for the purposes of section A2D3(4) of the Apprenticeships, Skills, Children and Learning Act 2009, and on approval of the TQ at the Final Approval Milestone and on any subsequent Approval, to the extent that any copyright or any rights in copyright forming part of the Assigned Rights have not then been assigned to and vested absolutely in the Authority, they shall be transferred to the Authority by operation of statute in accordance with section A2IA of the Apprenticeships, Skills, Children and Learning Act 2009. Intellectual Property Rights in the Guide Standard Exemplification Materials is assigned to the Authority by virtue of 2.1 above.

3 Licences to the Authority

3.1 The Supplier hereby grants to the Authority (and the Authority shall have, in addition to any retained rights under clause 13.8 of the TQ Agreement) a non-exclusive, perpetual, royalty-free, irrevocable, transferable worldwide licence to use, exploit and sub-license the IPR in the Ancillary Materials and the Supplier's Background IPR and, in respect of any IPR in Key Materials, in each case to the extent that the same are not at the relevant time vested absolutely in the Authority, as necessary to enable the Authority (and its sub-licensees) to:

3.1.1 use the Key Materials and Ancillary Materials in its administration, approval and oversight of the TQ and other T Level technical education qualifications and to make the same available to others (such as Ofqual) to do the same; and

3.1.2 to use the Key Materials and the Ancillary Materials, and for any Future Supplier or potential Future Supplier to use the Key Materials and the Ancillary Materials:

(i) for competing or tendering for the delivery and Operation of the TQ and/or any Replacement TQ, during any Transition Period and following expiry or termination of the TQ Agreement; and

(ii) to deliver and Operate the TQ and any Replacement TQ, during any Transition Period and following expiry or termination of the TQ Agreement; and

3.1.3 otherwise to receive and use the Services and the Deliverables and allow any Future Supplier to use the Deliverables; and

3.1.4 to sub-license others to exercise the rights set out in this clause 3.1.

3.2 The Authority agrees that it shall use any Ancillary Materials which fall solely within element (l) of the definition of Ancillary Materials (being "*lists, with contact details, of people contracted by the Supplier to perform or oversee activities which are necessary for the conduct and quality assurance of assessments for the TQ*") only for the purposes of planning for or executing an Emergency Exit.

4 Licence to the Supplier

4.1 The Authority hereby grants to the Supplier, in respect of the Assigned Rights, a worldwide, royalty free, perpetual and irrevocable non-exclusive licence, with the right to sublicense, to use and exploit the IPR in the Key Materials during and after the Term, but not, save as provided in the TQ Agreement, to use the same as part of a T Level, such licence being subject to clauses 13.13 and 13.14 of the TQ Agreement (which for these purposes shall survive any termination or expiry of the TQ Agreement).

5 Warranties and representations

5.1 The Supplier warrants and represents (on the Effective Date and on any relevant assignment or grant of licence taking effect) that:

5.1.1 it is or will be the sole legal and beneficial owner of, and that it owns all the rights and interests in the Assigned Rights no later than the time for assignment specified in clause 2.1 or when they are assigned in accordance with clause 13.2.1 of the TQ Agreement, save for Assigned Rights other than New IPR, in respect of which it has previously notified the Authority and the Authority has agreed in writing that this warranty shall not apply;

5.1.2 where it is not the sole legal and beneficial owner of the Assigned Rights, including the
Assigned Rights which are to be used or embodied in any Key Materials, it has
established that all owners of such rights consent to their assignment and transfer

absolutely to the Authority;

5.1.3 it has all the necessary right and title to grant all the licences granted to the Authority under this Assignment and Licence and the TQ Agreement;

5.1.4 it has not licensed or assigned and of the Assigned Rights other than pursuant to this Assignment and Licence or the TQ Agreement;

5.1.5 the Assigned Rights are free from any security interest, option, mortgage, change or lien;

5.1.6 it is unaware of any infringement or likely infringement of any of the Assigned Rights;

5.1.7 as far as it is aware, all the Assigned Rights are valid and subsisting and there are and have been no claims, challenges, disputes or proceedings, pending or threatened, in relation to the ownership, validity or use of any of the Assigned Rights;

5.1.8 the use of the Key Materials and Ancillary Materials, and exploitation of the Assigned Rights by the Supplier in the provision of the Services and Deliverables or by the Authority in receiving and using the Services and Deliverables or procuring any Replacement Services or by aby Future Supplier in Operating any Replacement Services, will not infringe the rights of any third party; and

5.1.9 the Key Materials are its original work and have not been copied wholly or substantially

from any other source.

6 Indemnity

6.1 Subject to clause 19, if there is an IPR Claim, the Supplier indemnifies the Authority against all losses, damages, costs or expenses (including professional fees and fines) incurred as a result.

6.2 If an IPR Claim is made or anticipated, the Supplier must at its own expense and the Authority's sole option, either:

6.2.1 obtain for the Authority the rights in clause 2.1 and 3.1 without infringing any Third Party IPR; or

6.2.2 replace or modify the relevant item with substitutes that do not infringe IPR without adversely affecting the functionality or performance of the Deliverables.

7 Moral rights

7.1 The Supplier shall procure written absolute waivers from all authors of the Key Materials and Ancillary Materials in relation to all their moral rights arising under the Copyright, Designs and Patents Act 1988 in relation to the Key Materials and Ancillary Materials and, as far as is legally possible, any broadly equivalent rights such authors may have in any territory of the world.

8 Ending or extending the Assignment and Licence

8.1 This Assignment and Licence ends if terminated by the Authority for any reason set out in this Assignment and Licence.

8.2 If any of the following events happen, the Authority has the right to immediately Terminate this Assignment and Licence or any of the licences granted under this Assignment and Licence by issuing a Termination Notice to the Supplier (in the latter case specifying the relevant licences):

8.2.1 a Default incapable of remedy;

8.2.2 a Default capable of remedy that us not corrected within 30 days; and

8.2.3 anything occurs which entitles the Authority to terminate the TQ Agreement.

9 Claims against third parties

9.1 The Supplier may take any action it considers appropriate or necessary, subject to the Authority's prior written consent, not to be unreasonably withheld or delayed, if there is a breach, other than in connection with the TQ, by a third party of the Authority's rights in any IPR licensed to the Supplier under clause 4, and the Authority agrees to provide all such assistance as the Supplier may reasonably require (subject to meeting the Authority's reasonably agreed costs and expenses and the Supplier hereby indemnifying the Authority in respect of any loss, damage or liability the Authority incurs by reason of any such action).

10 Further assurance

10.1 At the Authority's expense the Supplier shall, and shall use all reasonable endeavours to procure that any necessary third party shall, promptly execute and deliver such documents and perform such acts as may reasonably be required for the purpose of giving full effect to this Assignment and Licence and the TQ Agreement, including:

10.1.1 registration of the Authority as applicant or (as applicable) proprietor of the Assigned Rights; and

10.1.2 assisting the Authority in obtaining, defending and enforcing the Assigned Rights, and assisting with any other proceedings which may be brought by or against the Authority against or by any third party relating to the Assigned Rights.

10.2 The Supplier appoints the Authority to be its attorney in its name and on its behalf to execute documents, use the Supplier's name and do all things which are necessary or desirable for the Authority to obtain for itself or its nominee the full benefit of this Assignment and Licence.

10.3 This power of attorney is irrevocable and is given by way of security to secure the performance of the Supplier's obligations under this Assignment and Licence and the proprietary interest of the Authority in the Assigned Rights and so long as such obligations of the Supplier remain undischarged, or the Authority has such interest, the power may not be revoked by the Supplier, save with the consent of the Authority.

10.4 Without prejudice to clause 10.2, the Authority may, in any way it thinks fit and in the name and on behalf of the Supplier:

10.4.1 take any action that this Assignment and Licence requires the Supplier to take;

10.4.2 exercise any rights which this Assignment and Licence gives to the Supplier; and

10.4.3 appoint one or more persons to act as substitute attorney(s) for the Supplier and to exercise such of the powers conferred by this power of attorney as the Authority thinks fit and revoke such appointment.

10.5 The Supplier undertakes to ratify and confirm everything that the Authority and any substitute attorney does or arranges or purports to do or arrange in good faith in exercise of any power granted under this clause 10.

11 How much each Party can be held responsible for

11.1 Each Party's total aggregate liability under this Assignment and Licence (whether in tort, contract or otherwise) for each claim or series of connected claims is no more than £1 million.

11.2 No party is liable to the other for:

11.2.1 any indirect Losses; or

11.2.2 loss if profits, turnover, savings, business opportunities or damage to goodwill (in each case whether direct or indirect)

11.3 The limitation of liability set out in clause 11.1 does not apply to either Party in relation to the following:

11.3.1 its liability for death or personal injury caused by its negligence, or that of its employees, against or subcontractors;

11.3.2 bribery or fraud or fraudulent misrepresentation by it or its employees; or

11.3.3 any liability that cannot be excluded or permitted by Law.

11.4 Each Party must use all reasonable endeavours to mitigate any Losses which it suffers under or in connection with this Assignment and Licence, including where any such Losses are covered by an indemnity.

11.5 When calculating the Supplier's liability under clause 11.1, Losses covered by Required Insurances will not be taken into consideration.

12 Invalid parts of this Assignment and Licence

12.1 If any part of this Assignment and Licence is prohibited by Law or judged by a court to be unlawful, void or unenforceable, it must be removed from this Assignment and Licence as much as required and rendered ineffective as far as possible without affecting the rest of the Assignment and Licence, or whether it is valid or enforceable.

13 No other terms apply

13.1 Except as otherwise expressly provided in this Assignment and Licence or in the TQ Agreement, the provisions incorporated into this Assignment and Licence are the entire agreement between the Parties. The Assignment and Licence replaces all previous statements and agreements whether written or oral. No other provisions apply.

13.2 Variation of this Assignment and Licence is only effective if agreed in writing and signed by both Parties.

14 Other people's rights in this Assignment and Licence

14.1 No third parties may use the Contracts (Rights of Third Parties) Act ("**CRTPA**") to enforce any term of this Assignment and Licence unless stated (referring to CRTPA) in this Assignment and Licence. This does not affect third party rights and remedies that exist independently from CRTPA.

15 Relationships created by this Assignment and Licence

15.1 This Assignment and Licence does not create a partnership, joint venture or employment relationship. The Supplier must represent themselves accordingly and ensure others do so.

16 Giving up contract rights

16.1 A partial or full waiver or relaxation of the terms of this Assignment and Licence is only valid if it is stated to be a waiver in writing to the other Party.

17 Transferring responsibilities

17.1 The Supplier must not assign this Assignment and Licence without Approval.

17.2 The Authority can assign, novate or transfer this Assignment and Licence or any part of it to any Crown Body, public or private sector body which performs the functions of the Authority.

17.3 The Supplier must enter into a novation agreement in the form that the Authority specifies in order to use its rights under clause 17.2.

17.4 The Supplier can terminate this Assignment and Licence if it is novated under clause 17.2 to a private sector body that is experiencing an Insolvency Event.

18 How to communicate about this Assignment and Licence

18.1 All notices under this Assignment and Licence must be in writing and are considered effective on the Working Day of delivery as long as delivered before 5:00 pm on a Working Day. Otherwise the notice is effective on the next Working Day. An email is effective when sent unless an error message is received.

18.2 Notices to the Authority must be sent to the Authority Authorised Representative's address and email address, and all notices must be copied to the Authority's Head of Commercial Delivery Management (xxx@education.gov.uk) and the Authority's General Counsel (xxx@education.gov.uk) .

18.3 This clause does not apply to the service of legal proceedings or any documents in any legal action, arbitration or dispute resolution.

19 Dealing with claims

19.1 If a Beneficiary is notified or otherwise becomes aware of a Claim then it must notify the Indemnifier as soon as reasonably practical and no later than 10 Working Days after such notification or date of first awareness.

19.2 At the Indemnifier's cost the Beneficiary must both:

19.2.1 allow the Indemnifier to conduct all negotiations and proceedings to do with a Claim; and

19.2.2 give the Indemnifier reasonable assistance with the Claim if requested.

19.3 The Beneficiary must not make admissions about the Claim without the prior written consent of the Indemnifier which cannot be unreasonably withheld or delayed.

19.4 The Indemnifier must consider and defend the Claim diligently using competent legal advisors and in a way that does not damage the Beneficiary's reputation.

19.5 The Indemnifier must not settle or compromise any Claim without the Beneficiary's prior written consent which it must not unreasonably withhold or delay.

19.6 Each Beneficiary must take all reasonable steps to minimise and mitigate any losses that it suffers because of the Claim.

19.7 If the Indemnifier pays the Beneficiary money under an indemnity and the Beneficiary later recovers money which is directly related to the Claim, the Beneficiary must immediately repay the Indemnifier the lesser of either:

19.7.1 the sum recovered minus any legitimate amount spent by the Beneficiary when recovering this money; or

19.7.2 the amount the Indemnifier paid the Beneficiary for the Claim.

20 Resolving disputes

20.1 If there is a Dispute, the senior representatives of the Parties who have authority to settle the Dispute will, within 28 days of a written request from the other Party, meet in good faith to resolve the Dispute.

20.2 If the Dispute is not resolved at that meeting, the Parties can attempt to settle it by mediation using the Centre for Effective Dispute Resolution ("**CEDR**") Model Mediation Procedure current at the time of the Dispute. If the Parties cannot agree on a mediator, the mediator will be nominated by CEDR. If either Party does not wish to use, or continue to use mediation, or mediation does not resolve the Dispute, the Dispute must be resolved using clauses 20.3 to 20.5.

20.3 Unless the Authority refers the Dispute to arbitration using clause 20.4, the Parties irrevocably agree that the courts of England and Wales have the exclusive jurisdiction to:

20.3.1 determine the Dispute;

20.3.2 grant interim remedies, or any other provisional or protective relief.

20.4 The Supplier agrees that the Authority has the exclusive right to refer any Dispute to be finally resolved by arbitration under the London Court of International Arbitration Rules current at the time of the Dispute. There will be only one arbitrator. The seat or legal place of the arbitration will be London and the proceedings will be in English.

20.5 The Authority has the right to refer a Dispute to arbitration even if the Supplier has started or has attempted to start court proceedings under clause 20.4, unless the

Authority has agreed to the court proceedings or participated in them. Even if court proceedings have started, the Parties must do everything necessary to ensure that the court proceedings are stayed in favour of any arbitration proceedings if they are started under clause 20.4.

20.6 The Supplier cannot suspend the performance of this Assignment and Licence during any Dispute.

21 Which law applies

21.1 This Assignment and Licence and any issues arising out of, or connected to it, are governed by English law.

ANNEX

IPR Assurance Certificate

This certificate is given pursuant to clause 13.9 of the agreement ("**Contract**") between the Institute for Apprenticeships and Technical Education ("**Authority**") and the supplier named below ("**Supplier**"), and the Intellectual Property Assignment and Licence between the Authority and the Supplier (which also forms Schedule 14 of the Contract) ("**Assignment and Licence**").[1]

Guidance:

When to complete this certificate: This certificate should be completed in respect of each Deliverable (as defined in the Contract) which is made available to the Authority under the Contract, and a completed certificate should be supplied to the Authority with that Deliverable. This includes updates to existing Deliverables.

Purpose of this certificate: This certificate is intended to confirm that the specific Deliverable fully complies with the intellectual property provisions of the Contract. A copy of the certificate will be retained by the Authority as evidence of the intellectual property position.

Supplier Declaration:

We (being the Supplier named below) confirm that the Deliverable(s) supplied together with (or shortly before or after) this certificate, all elements of which are listed in either Table 1 or Table 2 below[2], comply with the intellectual property provisions in the Contract, in particular the applicable warranties set out in clause 5 of the Assignment and Licence.

We confirm that the Deliverable(s) either:
(i) contain no third party intellectual property rights, or
(ii) contain third party intellectual property rights and we have obtained the consent of the applicable third party:

- in the case of Key Materials, to their assignment and transfer to the Authority; and/or
- in the case of Ancillary Materials, to their licence to the Authority,

in each case on the terms and conditions of the Contract and Assignment and Licence.

We confirm that this certificate overrides any statement or copyright notice forming part of the Deliverable(s) which is in any way inconsistent with this certificate. We agree that this certificate does not detract in any way from the rights granted to the Authority in the Contract.

Key Materials

We confirm that the Deliverable(s) set out in Table 1 below, or the elements of the Deliverable(s) set out in Table 1 below, are Key Materials, as defined in the Contract:

---

[1] The parties have agreed to replace the certificate in the form set out in the Annex to Schedule 14 of the Contract with this completed version, which lists Deliverables that are being made available to the Authority. For the avoidance of doubt, an additional completed version of this certificate may be produced for a Deliverable in the event that the Deliverable is updated and made available to the Authority. No Deliverable(s) listed on this and any other certificate shall be removed or replaced unless otherwise specified by the Authority.

[2] If, by exception, the Supplier asserts that the Deliverable includes elements which are neither Key Materials nor Ancillary Materials, this should be notified in writing to the Authority prior to the relevant Deliverable being made available to the Authority.

Table 1

TQ Deliverable	Component	Filename/Title	Version	Date submitted	Key Material Applicable Rights
Set out the Product / Deliverable name (e.g. “TQ Specification”, “Specimen Assessment Materials”, “Guide Standard Exemplification Materials”	E.g. “Core”, Occupational Specialism “title/name”,	Filename as saved / visible to end users who will download the file	Version number as submitted and recorded on the Deliverable	Date the final version was submitted to the Authority	Set out elements which are Key Materials, or confirm “entire Deliverable”

All intellectual property rights in the Deliverable(s), or elements of the Deliverable(s) listed above in Table 1 as Key Materials, have vested or hereby vest in the Authority pursuant to the Assignment and Licence.

Ancillary Materials

We confirm that the Deliverable(s) set out in Table 2 below, or the elements of the Deliverable set out in Table 2 below are Ancillary Materials, as defined in the Contract:

Table 2

TQ Deliverable	Component	Filename/Title	Version	Date submitted	Ancillary Material Applicable Rights
Set out the Product / Deliverable name (e.g. “Assessment Strategy”	Record “N/A” if not applicable	Filename as saved / visible to end users who will download the file	Version number as submitted and recorded on the Deliverable	Date the final version was submitted to the Authority	Set out elements which are Ancillary Materials, or confirm “entire Deliverable”

All intellectual property rights in the Deliverable(s), or elements of the Deliverable(s) listed above in Table 2 as Ancillary Materials, are licensed to the Authority on the terms and conditions of and pursuant to the Assignment and Licence.

Signed for and on behalf of the Supplier:

Signed by

[*Supplier*]

Director: ……..[Insert/print name]

Signature: ……...

Signed by

THE INSTITUTE FOR APPRENTICESHIPS AND TECHNICAL EDUCATION

Director: ……..[Insert/print name]

Signature: ……...

Schedule 15

Monitoring of Performance

1 Self monitoring

1.1 The Supplier shall monitor its performance of the Services (other than the Initial Development Services) and (where applicable) the supply of the Products against each KPI (in the manner set out in paragraph 1.2) and shall deliver to the Authority Authorised Representative the Operational Delivery Report in accordance with paragraph 3 (*Operational Delivery Report and Performance Review Meetings*).

1.2 The Supplier shall, in respect of each KPI, apply the applicable Performance Monitoring Methodology to such KPI to assess the Supplier's performance of such relevant KPI during the relevant Performance Monitoring Period.

2 What happens if you don't meet the Service Levels

2.1 The Supplier shall at all times provide the Services and (where applicable) supply the Products to meet or exceed the Target Service Level for each KPI.

2.2 If, in any Contract Month in which a Performance Monitoring Period for a KPI ends, the Supplier fails to achieve the Target Service Level for that KPI ("**Service Failure**"), the Supplier shall submit to the Authority (as part of the Operational Delivery Report for that Contract Month) for Approval an improvement plan ("**KPI Improvement Plan**") setting out:

2.2.1 the reasons for such Service Failure; and

2.2.2 what steps the Supplier proposes to take to:

(i) mitigate the impact of the Service Failure;

(ii) rectify the event, matter or circumstances giving rise to the Service Failure (including details of the proposed timings for such rectification); and

(iii) prevent the Service Failure from recurring.

2.3 The Authority shall (as soon as reasonably practicable following receipt of the KPI Improvement Plan) either:

2.3.1 confirm to the Supplier that the KPI Improvement Plan is Approved and following receipt of such Approval the Supplier shall:

(i) carry out and complete all of the actions in accordance with the approved KPI Improvement Plan; and

(ii) report on its progress against such KPI Improvement Plan in each and every Performance Review Meeting which occurs whilst the Supplier is (or should be, if it was complying with its obligations under this Contract) carrying out and completing the actions in accordance with the KPI Improvement Plan; or

2.3.2 confirm to the Supplier that the Authority is not satisfied with the KPI Improvement Plan and/or that the steps proposed by the Supplier in the KPI Improvement Plan will address the matters referred to in paragraph 2.2.1, in which case the provisions of clause 14.2 (*What may happen if there are issues with your provision of the Services*) shall apply.

2.4 Where:

2.4.1 the Supplier fails to provide a KPI Improvement Plan in accordance with paragraph 2.2; or

2.4.2 following Approval by the Authority of the KPI Improvement Plan in accordance with paragraph 2.3, the Supplier fails to carry out and/or complete the actions in accordance with the KPI Improvement Plan (as Approved),

then such failure shall be deemed to be a Critical Service Failure.

3 Operational Delivery Report and Performance Review Meetings

3.1 Within 5 Working Days after the end of each Contract Month, the Supplier shall deliver to the Authority Authorised Representative the Operational Delivery Report in respect of the performance by the Supplier of the Services and (where applicable) the supply

of the Products) during the Contract Month just ended together with updated versions (meeting, where applicable, all of the requirements of the relevant Product Description) of the following:

3.1.1 the Implementation and Delivery Plan;

3.1.2 the Resource Plan;

3.1.3 the Risk Register

3.1.4 the Issues Log

3.1.5 the Assessment Strategy; and

3.1.6 any draft version of the Key Dates Schedule that the Supplier intends shall (if Approved) become the Key Dates Schedule for the purposes of this Contract from time to time.

3.2 Within 5 Working Days of receipt by the Authority Authorised Representative of the Operational Delivery Report for the relevant Contract Month, the Parties shall attend a meeting to discuss the content of the relevant Operational Delivery Report (the "**Performance Review Meeting**") at such location and time (within normal business hours) as the Authority shall reasonably require and such Performance Review Meeting shall:

3.2.1 be attended by the Authority Authorised Representative and the Supplier Authorised Representative and/or such other senior representatives of either Party as the Authority Authorised Representative and/or the Supplier Authorised Representative shall reasonably require (having regard to the matters to be discussed at the relevant Performance Review Meeting); and

3.2.2 be fully minuted by the Supplier and the minutes shall be circulated by the Supplier to all attendees at the relevant Performance Review Meeting (and any other recipients agreed at the relevant meeting) as soon as reasonably practicable following the relevant Performance Review Meeting.

3.3 The minutes of the preceding Contract Month's Performance Review Meeting will be agreed and signed by both the Authority Authorised Representative and the Supplier Authorised Representative at or prior to the following Performance Review Meeting.

3.4 Without prejudice to clause 9 (*Record keeping, monitoring and reporting*), the Supplier shall provide to the Authority such additional information and/or documentation as the

Authority may reasonably require in order to verify the Supplier's compliance with its obligations under this Contract, including to verify:

3.4.1 whether a Service Failure has occurred; and/or

3.4.2 the level of the performance by the Supplier of the whole or any part of the Services and (where applicable) the supply of the Products.

and the Supplier shall provide such information and/or documentation within such time period as the Authority shall reasonably specify at the time of making the request for such information and/or documentation.

Schedule 15: Annex 1 – Key Performance Indicators

KPI (desired outcome)	Relevant Service Requirements (incl references to the relevant paragraph of Part 1 of the Service Requirements detailing the relevant element of the Services)	Target performance levels	Performance Monitoring Period	Evidence of performance	Measurement methodology
1. The Supplier has in place clear and TQ specific arrangements to approve Eligible Providers and monitor Approved Providers and (i) completes the relevant processes for approval quickly upon application and (ii) carries out the required monitoring	TQ Provider approval and monitoring services – paragraph 3	(i) 100% of applications from Eligible Providers decided within 30 Working Days of receipt of application; and (ii) Supplier has carried out the required monitoring in accordance with the Implementation and Delivery Plan and/or the Assessment Strategy.	Each Contract Month following IfATE Approval	Management Information in relation to: (i) Eligible Providers that have applied for approval and in respect of which a decision has been made; and (ii) details of monitoring undertaken.	Performance measurement will include Eligible Providers new to the Supplier as well as the Supplier's existing Eligible Providers who have applied to have their approval extended to include the TQ.

KPI (desired outcome)	Relevant Service Requirements (incl references to the relevant paragraph of Part 1 of the Service Requirements detailing the relevant element of the Services)	Target performance levels	Performance Monitoring Period	Evidence of performance	Measurement methodology
2. Supplier has ensured that Approved Providers are clear about what they are expected to teach and to what standard of attainment, and about how Students will be assessed	Initial TQ deliverables and development services – paragraph 2 TQ Provider support services – paragraph 4 TQ live assessment design and delivery – paragraph 6	80% of Approved Providers that have responded to the survey, rating at least 4 on a 1-5 scale. The target performance scale will use 2 positive, 2 negative and 1 neutral response. (For example (noting that the exact wording of the descriptors may vary) where 5 = very clear 4 = mostly clear 3 = moderately clear	During the Summer Term each Academic Year from September 2026	The Authority shall undertake or commission a survey of Approved Providers delivering the TQ	Online questionnaire to Approved Providers delivering the TQ in the relevant Academic Year. This survey should achieve a minimum response rate of 20% of those surveyed to be valid

KPI (desired outcome)	Relevant Service Requirements (incl references to the relevant paragraph of Part 1 of the Service Requirements detailing the relevant element of the Services)	Target performance levels	Performance Monitoring Period	Evidence of performance	Measurement methodology
		2 = mostly unclear 1 = not clear at all)			
3. Queries from Eligible Providers and Approved Providers (other than those related to KPI 4 and KPI 11) are satisfactorily resolved in accordance with the Target Service Level	Initial TQ deliverables and development services – paragraph 2 TQ Provider approval and monitoring services – paragraph 3 TQ Provider support services – paragraph 4 Student registration and student entry – paragraph 5 TQ live assessment design and delivery – paragraph 6 TQ Post-Results Services – paragraph 9	Queries raised by letter and other forms of electronic correspondence: 90% resolved within 10 Working Days; remaining 10% resolved within 15 Working Days; and Queries raised through telephone calls: 90% resolved within 2 Working Days; remaining 10% resolved within 10 Working Days	Each Contract Month from the Effective Date	Management Information based on data and information collected from the Supplier's customer management systems referred to in Service Requirement 5 in Part 2 of the Service Requirements. This must include relevant information that closed queries have been satisfactorily resolved.	The required resolution time commences on and from the Working Day on which the relevant query is received by the Supplier Percentage of queries that are resolved in accordance with the applicable Target Service Level

KPI (desired outcome)	Relevant Service Requirements (incl references to the relevant paragraph of Part 1 of the Service Requirements detailing the relevant element of the Services)	Target performance levels	Performance Monitoring Period	Evidence of performance	Measurement methodology
4. Formal complaints made about the Services are satisfactorily resolved (i) in accordance with the timescales set out in the Implementation and Delivery Plan[2] or (ii) where complaints are received solely by the Department, ESFA or the Authority, within the timescales reasonably required by the Department, ESFA or the Authority at the time of notifying the Supplier of such complaints	Initial TQ deliverables and development services – paragraph 2 TQ Provider approval and monitoring services – paragraph 3 TQ Provider support services – paragraph 4 Student registration and student entry – paragraph 5 TQ live assessment design and delivery – paragraph 6 TQ Post-Results Services – paragraph 9	100% of formal complaints are resolved within: (i) the relevant timescales detailed in the Implementation and Delivery Plan; or (ii) the timescales specified by the Department, ESFA or the Authority, (as the case may be).	Each Contract Month from the Effective Date	Management Information based on data and information collected from the Supplier's customer management systems referred to in Service Requirement 5 in Part 2 of the Service Requirements. This must include relevant information that complaints have been satisfactorily resolved.	The required resolution time commences on and from the Working Day on which the relevant complaint is received by the Supplier. Percentage of complaints that are satisfactorily resolved within the applicable Target Service Level. Any complaints received solely by the Department, ESFA or the Authority, in relation to the Services, shall be deemed to have been received by the Supplier on the date on which the Supplier is notified of the complaint by the

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KPI (desired outcome)	Relevant Service Requirements (incl references to the relevant paragraph of Part 1 of the Service Requirements detailing the relevant element of the Services)	Target performance levels	Performance Monitoring Period	Evidence of performance	Measurement methodology
					Department, ESFA or the Authority.
5. Approved Providers are satisfied with the quality of the Provider Services	TQ Provider approval and monitoring services – paragraph 3 TQ Provider support services – paragraph 4 Student registration and student entry – paragraph 5 TQ live assessment design and delivery – paragraph 6 TQ Post-Results Services – paragraph 9	80% of Approved Providers that have responded to the survey, rating at least 4 on a 1-5 scale. The target performance scale will use 2 positive, 2 negative and 1 neutral response. For example (noting that the exact wording of the descriptors may vary) (where 5 = very satisfied	During the Summer Term each Academic Year from September 2026	The Authority shall undertake or commission a survey of Approved Providers delivering the TQ	Online questionnaire to Approved Providers delivering the TQ in the relevant Academic Year. This survey should achieve a minimum response rate of 20% of those surveyed to be valid.

KPI (desired outcome)	Relevant Service Requirements (incl references to the relevant paragraph of Part 1 of the Service Requirements detailing the relevant element of the Services)	Target performance levels	Performance Monitoring Period	Evidence of performance	Measurement methodology
		4 = satisfied 3 = neither satisfied nor dissatisfied 2 = dissatisfied 1 = very dissatisfied).			
6.A sufficient number of appropriately qualified and trained Assessors (and Moderators where permitted in accordance with the Approved Assessment Strategy) are available to assess (or Moderate, if applicable) Student assessment evidence when required in accordance with the Implementation and Delivery and/or the Resource Plan (as the case may be)	TQ live assessment design and delivery – paragraph 6	100% of appropriately qualified and trained Assessors (and Moderators, if applicable) are available in accordance with the Implementation and Delivery Plan and/or the Resource Plan (as the case may be).	Each Contract Month from (and including) September 2026	Management Information in relation to Assessor (and Moderator, if applicable) actual recruitment, training, and retention against the details set out in the Implementation and Delivery Plan and Resource Plan (as the case may be).	Performance will be measured against the number of Assessors (and Moderators, if applicable) that are envisaged as being trained and available as detailed in the Implementation and Delivery Plan and/or the Resource Plan (as the case may be).

KPI (desired outcome)	Relevant Service Requirements (incl references to the relevant paragraph of Part 1 of the Service Requirements detailing the relevant element of the Services)	Target performance levels	Performance Monitoring Period	Evidence of performance	Measurement methodology
7. The TQ Live Assessment Materials (as defined in the Service Requirements) are high quality and developed in accordance with the Assessment Strategy	TQ live assessment design and delivery – paragraph 6	Full compliance with parts of both the Assessment Strategy and Implementation Plan that relate to the development of the TQ Live Assessment Materials; and TQ Live Assessment Materials are 100% free of errors that could affect clarity about requirements for Students.	Each Contract Month from IfATE Approval	Management Information in relation to: (i) progress against and compliance with the relevant part of the Assessment Strategy and Implementation Plan; and (ii) any errors reported in TQ Live Assessment Materials.	Review of Supplier self-reporting Identification of any reported errors in TQ Live Assessment Materials.
8. Student assessment evidence is accurately assessed and processed for grading and awarding in accordance with the relevant parts of the Assessment Strategy	TQ live assessment design and delivery – paragraph 6 TQ Grade awarding – paragraph 7	Assessing of Student assessment evidence is conducted in accordance with the relevant parts	Each Contract Month from September 2026 until the end of the Term	Management Information in relation to compliance with the relevant parts of the Assessment Strategy and the relevant parts of the Implementation and Delivery Plan.	Review of Supplier self-reporting.

KPI (desired outcome)	Relevant Service Requirements (incl references to the relevant paragraph of Part 1 of the Service Requirements detailing the relevant element of the Services)	Target performance levels	Performance Monitoring Period	Evidence of performance	Measurement methodology
and the Implementation and Delivery Plan		of the Assessment Strategy; and 100% of Students' assessments are marked and processed in accordance with the relevant parts of the Implementation and Delivery Plan.			
9. Grade Standard Exemplification Materials are validated by Employers	TQ live assessment design and delivery – paragraph 6 TQ Grade awarding – paragraph 7	At least 5 Employers in each relevant Occupational Specialist Component.	In October in each Academic Year following the first grade awarding but in any event no later than from October 2028	Evidence of validation from Employers relevant to the Occupational Specialist Components that validate the Grade Standard Exemplification Materials. The Supplier may use its existing network of Employers, but it must ensure a turnover of Employers each Academic Year. Employers may take part in validation activity for up to two consecutive Academic Years, after	Validation means that Employers relevant to the Occupational Specialist Components judge that the Grade Standard Exemplification Materials are comparable to the Approved Guide Standard Exemplification Materials. Validation also means that Employers relevant to the Occupational Specialist Components

KPI (desired outcome)	Relevant Service Requirements (incl references to the relevant paragraph of Part 1 of the Service Requirements detailing the relevant element of the Services)	Target performance levels	Performance Monitoring Period	Evidence of performance	Measurement methodology
				which they must not take part in validation activity for a period of one Academic Year. Suppliers may then repeat this cycle, ensuring that Employers do not take part in validation activity for more than two consecutive Academic Years. For each Occupational Specialist Component, validations are required from at least two new Employers each Academic Year who did not submit evidence of validation in any previous Academic Year.	judge that the Grade Standard Exemplification Material on the pass boundary is the type of work Employers would expect to see from an employee, who is of Occupational Entry Competence and that the Grade Standard Exemplification Material on the distinction boundary, is the type of work that exceeds Employer expectations of what they would expect to see from an employee who is of Occupational Entry Competence, as defined within the assessment strategy as distinction. Review by the Authority of the evidence of Validation from Employers.

KPI (desired outcome)	Relevant Service Requirements (incl references to the relevant paragraph of Part 1 of the Service Requirements detailing the relevant element of the Services)	Target performance levels	Performance Monitoring Period	Evidence of performance	Measurement methodology
10. Student assessment results are submitted to the Authority (or its nominee (as applicable)) by the relevant date(s) set out in the Key Dates Schedule	TQ Grade awarding – paragraph 7 TQ Results – paragraph 8	100% of results are submitted to the Authority (or its nominee) by the date(s) set out in the relevant Key Dates Schedule.	Each Contract Month from September 2026 until the end of the Term	Results have been received by the Authority (or its nominee (as applicable)) in the required format.	Receipt of the results by the relevant date(s) in the relevant Key Dates Schedule.
11. Post-Results Services (excluding the issuing of revised assessment results, which is covered by KPI 10) are delivered in accordance with the relevant part of the Assessment Strategy	TQ Post-Results Services – paragraph 9	100% of the Post-Results Services are carried out and completed in accordance with the relevant part of the Assessment Strategy.	Each Contract Month from (and including) September 2026 until the end of the Term	Management Information in relation to compliance with the relevant part of the Assessment Strategy.	Review of self-reporting.
12. Submission to the Authority of: (i) all Management Information in accordance with the requirements of Service Requirement 9	TQ Provider approval and monitoring services – paragraph 3 Student registration and student entry – paragraph 5 Reporting – paragraph 10	100% for timeliness of the submission of all Management Information and all required (including requested) Products and/or	Each Contract Month from the Effective Date	Management Information and updated versions of the Products and/or other documents referred to in column one and/ or Key Materials and Ancillary Materials are received by	Review of self-reporting.

KPI (desired outcome)	Relevant Service Requirements (incl references to the relevant paragraph of Part 1 of the Service Requirements detailing the relevant element of the Services)	Target performance levels	Performance Monitoring Period	Evidence of performance	Measurement methodology
in Part 2 of the Service Requirements; and (ii) updated versions of all required Products in accordance with clause 5.5.1(i) and/or paragraph 3 of Schedule 15 (as the case may be); and (iii) where requested by the Authority, updated versions of all requested Products and/or other documents in accordance with clause 5.5.1(ii).		other documents including Key Materials and Ancillary Materials; and 100% for completeness of all: (i) Management Information; and (ii) required Products (including requested Products and/ or Key Materials and Ancillary materials).		the Authority by the date required by this Contract. Management Information, updated versions of the Products and/or other documents referred to in column one, Key Materials and Ancillary Materials are accurate and complete and cover all relevant information, Data and reports as specified in the Management Information and reporting requirements. Updated versions of the Products referred to in column one, Key Materials and Ancillary Materials include all relevant updates.	

Schedule 16

Logos and Trademarks – T Level Trade Mark Licence

1 Interpretation

The definitions and rules of interpretation in this paragraph apply in this T Level Trade Mark Licence, in addition to the definitions and rules of interpretation in Schedule 1 to this Contract.

1.1 Definitions:

"**Approved Provider**" means an Eligible Provider (as defined in Schedule 1 (*Definitions and Interpretation*) of this Contract) that has been granted Provider Approval (as defined in Schedule 1 (*Definitions and Interpretation*) of this Contract) and in respect of which such Provider Approval has not been revoked pursuant to clause 7.2 of this Contract (*Interaction with Providers*).

"**Brand Licensed Material**" means any instance of a Brand Licensed Product or Service in material form, including as an electronic copy or any other electronic form, and any promotional or marketing material relating to any Brand Licensed Product or Service;

"**Brand Licensed Product or Service**" means any products or services listed as such in Appendix 1 (and "**Brand Licensed Products**" and "**Brand Licensed Services**" means such Products or Services respectively;

"**Mandatory Marked Material**" is material of the type identified in Appendix 1 (and to which the Mark must be applied);

"**Mark**" means the trade mark(s) set out in Appendix 2, including the listed registrations and applications and any registrations which may be granted pursuant to those applications and the related trade marks, devices and get-ups that may be notified in writing by the Authority to the Supplier from time to time;

"**Marked Material**" means any Brand Licensed Material or other material in or on which the Mark is used.

2 Grant

2.1 The Authority hereby grants to the Supplier a non-exclusive licence to use the Mark on or in relation to the Brand Licensed Products or Services provided or supplied in England, including in connection with the promotion, use and supply of the Brand Licensed Products or Services.

2.2 The Supplier may, subject to the prior written approval of the Authority and paragraph 11, sublicense (without the right to further sublicense) each Approved Provider of the TQ to use the Mark on or in relation to the Brand Licensed Products or Services provided or supplied in England, including in connection with the promotion, use and supply of the Brand Licensed Products or Services.

2.3 Any use of the Mark in accordance with paragraph 2.1 or 2.2 shall be strictly in accordance with the T Level Branding Guidelines and, when using the Mark, the Supplier shall fully comply with, the T Level Branding Guidelines.

2.4 Subject to paragraph 2.2, the Supplier shall have no right to sublicense use of the Mark.

3 Application of the Mark

3.1 The Supplier shall use the Mark, in accordance with this Schedule, on all Mandatory Marked Materials.

3.2 Subject to clause 13.10 (*Intellectual Property Rights*) of the Contract and paragraph 3.3 below, apart from the Mark, no other trade mark or logo may be affixed or used in a manner in which it may be seen to be used as a trade mark or designation of origin in relation to any Brand Licensed Products or Services or in or on any Brand Licensed Materials.

3.3 The Supplier may, subject to the prior written agreement of the Authority, authorise each Approved Provider of the TQ sublicensed in accordance with paragraph 2.2 to use the Approved Provider's name, logos, trademarks and/or other signs which refer to the Approved Provider on Brand Licensed Products or Services or Brand Licensed Materials on the same terms as, and subject to compliance with clauses 13.10 and 13.11 (*Intellectual Property Rights*) of the Contract (and clauses 13.10 and 13.11 shall apply *mutatis mutandis* to such Approved Provider).

3.4 The Supplier shall procure that the Mark, when used in or on any Brand Licensed Materials, shall be clearly and reasonably prominently identified as a trade mark of the Authority, in such manner as is set out in the T Level Branding Guidelines, or with any other statement as notified by the Authority to the Supplier.

3.5 The Supplier shall comply strictly with the directions of the Authority regarding the form and manner of the application of the Mark, including the directions contained in the T Level Branding Guidelines.

3.6 The Supplier shall, on written request from the Authority or as otherwise provided in the T Level Branding Guidelines, provide samples of all proposed Marked Materials.

3.7 The Supplier shall not use in its business any other trade mark confusingly similar to the Mark and shall not use the Mark or any word confusingly similar to the Mark as, or as part of, its corporate or trading name.

4 Title, goodwill and registrations

4.1 The Supplier acknowledges that the Authority is the owner of the Mark.

4.2 Any goodwill derived from the use by the Supplier of the Mark shall accrue to the Authority. The Authority may, at any time, call for a document confirming the assignment of that goodwill and the Supplier shall immediately execute it.

4.3 The Supplier shall not do, or omit to do, or permit to be done, any act that will or may weaken, damage or be detrimental to the Mark or the reputation or goodwill associated with the Mark or the Authority, or that may invalidate or jeopardise any registration of the Mark.

4.4 The Supplier shall not apply for, or obtain, registration of the Mark in any country for any goods or services.

4.5 The Supplier shall not apply for, or obtain, registration of any trade or service mark in any country which consists of, or comprises, or is confusingly similar to, the Mark for any goods or services.

5 Quality control

5.1 The Supplier shall comply with the specifications and standards relating to the Brand Licensed Products or Services which are specified in the Contract.

5.2 The Supplier shall promptly provide the Authority with copies of all communications relating to the Mark with any regulatory, industry or other authority.

5.3 The Supplier shall permit, and shall use its best endeavours to obtain permission for, the Authority at all reasonable times and on reasonable notice to enter any place used for the production, storage or distribution of the Marked Materials to inspect the Marked Materials in relation to compliance with this T Level Trade Mark Licence.

5.4 Without prejudice to any other rights of the Authority, in the event that the Authority finds that any sample of Marked Materials does not meet the requirements of this T Level Trade Mark Licence, it may give notice to the Supplier, and the Supplier shall take all reasonable steps to correct any deficiency as soon as reasonably practicable (having regard to constraints of the academic timetable).

6 Marketing, advertising and promotion

6.1 The Supplier undertakes to ensure that its advertising, marketing and promotion of Brand Licensed Products or Services shall in no way reduce or diminish the reputation, image and prestige of the Mark.

7 Recordal of licence

7.1 The Authority may, at its own cost, record the licence granted to it in paragraph 2 in the relevant registries against any registrations and applications for registration of the Marks.

7.2 The Supplier shall, at the Authority's request, execute a formal licence in such form and provide such other assistance as may be required for the purpose of such recordal.

8 Protection of the Mark

8.1 The Supplier shall immediately notify the Authority in writing giving full particulars if any of the following matters come to its attention:

8.1.1 any actual, suspected or threatened infringement of the Mark;

8.1.2 any actual or threatened claim that the Mark is invalid;

8.1.3 any actual or threatened opposition to the Mark;

8.1.4 any claim made or threatened that use of the Mark infringes the rights of any third party;

8.1.5 any person applies for, or is granted, a registered trade mark by reason of which that person may be, or has been, granted rights which conflict with any of the rights granted to the Supplier under this T Level Trade Mark Licence; or

8.1.6 any other form of attack, charge or claim to which the Mark may be subject.

8.2 In respect of any of the matters listed in paragraph 8.1:

8.2.1 the Authority shall, in its absolute discretion, decide what action if any to take;

8.2.2 the Authority shall have exclusive control over, and conduct of, all claims and proceedings;

8.2.3 the Supplier shall not make any admissions other than to the Authority and shall provide the Authority with all assistance that it may reasonably require in the conduct of any claims or proceedings; and

8.2.4 the Authority shall bear the cost of any proceedings and shall be entitled to retain all sums recovered in any action for its own account.

8.3 The provisions of section 30 of the Trade Marks Act 1994 (or equivalent legislation in any jurisdiction) are expressly excluded.

8.4 Nothing in this T Level Trade Mark Licence shall constitute any representation or warranty that:

8.4.1 any registration comprised in the Mark is valid;

8.4.2 any application comprised in the Mark shall proceed to grant or, if granted, shall be valid; or

8.4.3 the exercise by the Supplier of rights granted under this T Level Trade Mark Licence will not infringe the rights of any person.

9 Liability, indemnity and insurance

9.1 Nothing in this paragraph shall impose or create any liability of the Supplier to the Authority for use in England of the Mark on or in respect of Mandatory Marked Materials in accordance with the terms of this T Level Trade Mark Licence.

9.2 To the fullest extent permitted by law, the Authority shall not be liable to the Supplier for any costs, expenses, loss or damage (whether direct, indirect or consequential, and whether economic or other loss of profits, business or goodwill) arising from the Supplier's exercise of the rights granted to it under this T Level Trade Mark Licence.

9.3 Save as provided in paragraph 9.1, the Supplier indemnifies the Authority against all Loss to the Authority arising out of or in connection with the Supplier's exercise of its rights granted under this T Level Trade Mark Licence, including any claim made against the Authority for actual or alleged infringement of a third party's intellectual property rights arising out of or in connection therewith, other than where any such Loss and/or claim arises exclusively from the use of the Mark in accordance with this T Level Trade Mark Licence.

10 Additional Supplier obligations

10.1 The Supplier shall:

10.1.1 only make use of the Mark for the purposes authorised in this T Level Trade Mark Licence; and

10.1.1 comply with all regulations and practices in force or use in any territory to safeguard the Authority's rights in the Mark.

10.2 The Supplier shall not, nor directly or indirectly assist any other person to:

10.2.1 use the Mark except as permitted under this T Level Trade Mark Licence; or

10.2.2 do or omit to do anything to diminish the rights of the Authority in the Mark or impair any registration of the Mark.

10.3 The Supplier acknowledges and agrees that the exercise of the licence granted to the Supplier under this T Level Trade Mark Licence is subject to all applicable laws, enactments, regulations and other similar instruments in any territory, and the Supplier understands and agrees that it shall at all times be solely liable and responsible for such due observance and performance.

11 Sub-licensing

11.1 The Supplier shall have the right to grant to Approved Providers a sub-licence of any of its rights under this T Level Trade Mark Licence provided that:

11.1.1 the Supplier shall ensure that the terms of any sub-licence are in writing and are substantially the same as the terms of this T Level Trade Mark Licence (except that the sub-licensee shall not have the right to sub-license its rights) and the Supplier shall provide the Authority with a copy of the sub-licence on request and the Authority may require that any such sublicence includes the Authority as a party, and that the Authority is entitled to enforce its terms;

11.1.2 all sub-licences granted shall terminate automatically on termination or expiry of this T Level Trade Mark Licence; and

11.1.3 the Supplier shall be liable for all acts and omissions of any sub-licensee in relation to such sub-licence and indemnifies the Authority against all Losses incurred or suffered by the Authority, or for which the Authority may become liable, (whether direct, indirect or consequential and including any economic loss or other loss of profits, business or goodwill) arising out of any act or omission of any sub-licensee in relation to such sub-licence, other than to the extent any such Losses arise exclusively from the use of the Mark in accordance with this T Level Trade Mark Licence.

12 Duration and termination

12.1 This T Level Trade Mark Licence shall commence on the Effective Date and shall continue for the Term.

12.2 Without affecting any other right or remedy available to it under this T Level Trade Mark Licence or the Contract, the Authority may terminate this T Level Trade Mark

Licence in respect of any Brand Licensed Product or Service with immediate effect by giving notice to the Supplier if:

12.2.1 the Supplier commits a material breach of any term of this T Level Trade Mark Licence in respect of such Brand Licensed Product or Service which breach is irremediable, or (if such breach is remediable) fails to remedy that breach within a period of 7 days after being notified to do so;

12.2.2 the Supplier repeatedly breaches any of the terms of this T Level Trade Mark Licence in respect of relevant Brand Licensed Products or Services or Brand Licensed Materials in such a manner as to reasonably justify the opinion that its conduct is inconsistent with it having the intention or ability to give effect to the terms of this T Level Trade Mark Licence; or

12.1.3 the Supplier challenges the validity of the Mark.

For the purposes of paragraph 12.2.1, **material breach** means a breach that is serious in the widest sense or of any of the obligations set out in paragraphs 3, 4.3, 4.4, 4.5, 5, 6.1, 10.1 or 11.1. In deciding whether any breach is material no regard shall be had to whether it occurs by some accident, mishap, mistake or misunderstanding.

13 Consequences of termination

13.1 On expiry or termination of this T Level Trade Mark Licence for any reason and subject to any express provisions set out elsewhere in this T Level Trade Mark Licence:

13.1.1 all rights and licences granted pursuant to this T Level Trade Mark Licence shall cease;

13.1.2 the Supplier shall cease all use of the Mark save as set out in this paragraph 13;

13.1.3 the Supplier shall co-operate with the Authority in the cancellation of any licences registered pursuant to this T Level Trade Mark Licence and shall execute such documents and do all acts and things as may be necessary to effect such cancellation;

13.1.4 the Supplier shall promptly deliver up to the Authority (or at the Authority's option, destroy) at the Supplier's expense all copies of promotional material

which is Marked Material or otherwise bears any Mark as a designation of origin; and

13.1.5 any provision of this T Level Trade Mark Licence that expressly or by implication is intended to come into or continue in force on or after termination or expiry of this T Level Trade Mark Licence shall remain in full force and effect.

13.2 Termination or expiry of this T Level Trade Mark Licence shall not affect any rights, remedies, obligations or liabilities of the parties that have accrued up to the date of termination or expiry, including the right to claim damages in respect of any breach of the T Level Trade Mark Licence which existed at or before the date of termination or expiry.

Schedule 16 Appendix 1

Brand Licensed Products or Services

Those products and services identified as such in the T Level Branding Guidelines.

Mandatory Marked Materials

All Key Materials and such other materials as are identified as such in the T Level Branding Guidelines.

T Level Branding Guidelines

(November 2023)

T Level Branding Guidelines

1 Introduction

1.1 T Levels are high-quality technical qualifications for 16 to 19-year olds which are approved and managed by the Institute for Apprenticeships and Technical Education (IfATE). The T Level brand has been devised to ensure that Government, Awarding Organisations, Employers, Suppliers, Providers (schools and colleges), Students, and others involved with the qualification, support and promote T Levels in a positive manner that inspires confidence.

1.2 IfATE's T Level Branding Guidelines, including supporting annexes (the 'Guidelines') are essential reference material for all Suppliers responsible for the delivery of the Technical Qualification (TQ) component of the T Level qualification.

1.3 For simplicity, the registered trade marks associated with the T Level brand are referred to in the Guidelines as the 'T Level Marks' and are as follows:

- The word 'T Level';
- The Department for Education's (DfE's) 'T Level' logo (in black);
- IfATE's name and accompanying flower logo (in blue and black as detailed within the IfATE brand guide); and
- the respective Supplier's corporate name and logo.

1.4 These Guidelines set out essential information as to how the T Levels Marks should be used in: a) TQ materials and b) other T Level communications including for marketing, advertising and promotional purposes.

1.5 These Guidelines are subject to reasonable development. They adopt many of the general principles which apply in relation to good branding practice, and where they are developed further IfATE intends that they will, in terms of general principles, be similar in many respects to commonly used branding guidelines.

2 General principles for use of the T Level Marks

2.1 When using the T Level Marks, Suppliers (and any other authorised users, such as Providers) must comply with these Guidelines (in addition to any other requirements of the TQ Contract and the IfATE brand guide).

2.2 The T Level Marks must be used by Suppliers on the front/landing/home page **only** of all Mandatory Marked Materials, key TQ documents and supporting resources (unless otherwise agreed by IfATE), in accordance with and in the form set out at **Annex 1**.

2.3 Nothing in these Guidelines is intended to restrict the use of the text mark 'T Level' where that use is necessary to indicate the intended purpose of a product or service and is in accordance with honest practices in industrial or commercial matters. (This does not apply, unless authorised and used in accordance with these Guidelines, to the use of the T Level logo.)

2.4 By way of example, use to describe the relevance or purpose of a text book or support materials for a specific technical education qualification forming part of a T Level is generally acceptable, but any such use which is liable to confuse third parties as to whether the relevant T Level is approved, managed or otherwise controlled by a party other than IfATE, or that the text book or support materials are endorsed and/or approved by IfATE would not be acceptable.

2.5 The Secretary of State for Education, or IfATE under delegation by the Secretary of State for Education, shall have the exclusive power to issue certificates of award and statements of achievement (and equivalent documents, excluding a breakdown of attainment) within the T Level Programme. It is intended that such documents will include the Supplier's name but not the Supplier's logo.

2.6 Suppliers must not issue any document bearing the title or name, or described or represented as, a 'certificate' or 'statement of achievement' or its substantial equivalent to which, or in respect of which, any T Level Mark is applied or used, or otherwise apply the T Level Marks to, or create an association with any T Level or TQ with any document or material bearing the title or name, or described or represented as, a 'certificate' or 'statement of achievement'" or its substantial equivalent.

2.7 Suppliers must use the T Level Marks on all *Mandatory Marked Materials* used in the operational delivery of the TQ. The documents classified as *Mandatory Marked Materials* are listed in **Annex 2.**

2.8 *Mandatory Marked Materials* should include a descriptive qualification name, as determined and/or mutually agreed by IfATE and the Supplier, in line with the TQ Contract and these Guidelines e.g. [technical qualification] in x [Pathway]".

2.9 Suppliers must ensure that it is clear that any T Level, or qualification associated with a T Level (such as the TQ), is a qualification approved and managed by IfATE. T Level Marks must not be used on any materials which relate to a T Level or TQ which has been wholly or partly superseded, unless the material is equally prominently identified as such.

2.10 Suppliers must, on request from IfATE, submit copies of any material where their name or branding, or any other trade marks or branding are used and/or in association with a T Level or a TQ.

2.11 Suppliers must not promote that, or give the impression that, any of its other qualifications - similar or equivalent – are linked to the TQ or T Level qualification i.e. other Level 2, 3 or 4 qualifications.

3 Intellectual Property Rights (IPR) and the TQ Contract

3.1 Full details of Suppliers' rights and responsibilities in respect of IPR are set out in the TQ Contract, and Suppliers should pay particularly close attention to clause 13 Intellectual Property Rights; Schedule 14 Form of Assignment and License; and Schedule 16 Logos and Trademarks – T Level Trade Mark Licence.

3.2 Providers engaged with the T Level qualification may use the T Level Marks but it is the responsibility of Suppliers to ensure that they comply with these Guidelines and the TQ Contract.

3.3 Suppliers should note that the T Level Marks are registered trade marks; any breach could lead to an action for trade mark infringement (as well as other consequences under the TQ Contract).

4 Advertising, marketing and promotion

4.1 Suppliers must ensure that any advertising, marketing and promotion products or services i.e. those activities outside the scope of the core TQ delivery component, do not undermine or diminish the reputation, image and prestige of the T Level Marks when used in any such aforementioned activity e.g. media advertising.

4.2 Suppliers may use the T Level Marks in relation to *Brand Licensed Products or Services* set out in **Annex 3**, in accordance with (and subject to) the terms of the TQ Contract and these Guidelines.

4.3 Suppliers must not give the impression that their visual identity is being used as a distinct brand, trade mark or designation of origin for any materials, including for activity defined as *Brand Licensed Products or Services.*

5 Style, positioning and form of T Level Marks

5.1 Suppliers must ensure that, except for the T Level Marks, no other trade marks, logos, banners or graphics are to be presented and/or affixed to any materials which relate to a T Level or TQ.

T Level Marks on TQ Materials

5.2 The T Level Marks should be included on the front page only of the TQ materials (whether in paper or digital form) in accordance with and in the form set out at **Annex 1**.

5.3 The T Level Marks should be acknowledged on the final page of the TQ materials (whether in paper or digital form) in accordance with and in the form set out at **Annex 1**.

T Level Marks on other T Level communications (including for marketing, advertising and promotional purposes)

Positioning/Layout:

5.4 T Level Marks may be represented in the form of a logo or graphic image ("**Logo Mark**"); or as an isolated word mark ("**Isolated Word Mark**"); or as a text or word mark[1] used within relevant text ("**Text Mark**") as described below. There are some common requirements in relation to each type of use (sections 6 to 8 - "No mixing", "Prominence" and "Acknowledgements") and some requirements which differ depending on the form in which Suppliers plan to use the mark (set out below).

5.5 Use of the word mark may also be made in oral form. The same principles should, so far as practicable, apply to oral use of any T Level Marks i.e. if appropriate, the respective changes being proposed are applied consistently.

5.6 Where it is used otherwise than in text form, the form in which the Supplier reproduces the logo or graphic should conform precisely to the logo and graphic forms designated by IfATE.

[1] Text form includes in spoken text

5.7 **Logo Mark**:

- Suppliers must use the Logo Mark in precisely the form and subject to any requirements set out in **Annex 1**;
- Suppliers must not change the colours, or skew, stretch or angle the logo, or distort, add a border or otherwise alter the logo in any way;
- Suppliers must ensure that the logos are always clearly separate from any other material, and in particular that it has a clear space surrounding the logos, as illustrated, specified or referenced at **Annex 1**.
- Suppliers must not resize the logo, unless resizing is permitted in accordance with these Guidelines.

5.8 **Isolated Word Mark**

- Suppliers must use the fonts and size ranges of font set out in or referenced in these Guidelines and/ or as otherwise specified by IfATE*;*
- Suppliers must use only the colours and weights set out in or referenced in these Guidelines and/ or as otherwise specified by IfATE;
- Suppliers must not use underlining;
- The words should have initial capitalisation (only) and no other punctuation etc. "T Level" is acceptable; "T LEVEL", "T level" or T-Level" are not acceptable; and
- Suppliers must not use the Isolated Word Mark as a watermark.

5.9 **Text Mark**:

- Suppliers must use the Text Mark in the same font as the surrounding text; and
- Suppliers must acknowledge its first use in the text as noted under paragraph 5.15 (Acknowledgement) of these Guidelines.

No mixing/combination/background use

5.10 Suppliers must ensure that the T Level Marks are always clearly separate from any other trade mark or name used in the same document. In particular:

- Suppliers must not use their trade mark mixed or combined with any other trade mark or name such that they could be seen or understood to be part of a single trade mark. For example, “the Mrs Blogs [Supplier] T Level” would not be acceptable use; and

- Suppliers must not combine a T Level Mark into a single logo or something which might be seen to be or have a unitary character. For example:

is not acceptable.

- The T Level Mark and a Supplier’s mark should not be combined into a single logo or something which might be seen to be or have a unitary character. For example:

is not acceptable.

- There should always be a clear separation between the T Level Mark and any other mark used by Suppliers or on any documents, and, when used as a logo or graphic, Suppliers should take account of any requirements for separation set out in these Guidelines.

5.11 Any use of a name given to the qualification element of a T Level (including any use of “TQ” as a reference to part of a T Level) should also only be such that it is always a clearly separate mark or name from any other trade mark or name used in the same document with any other trade mark or trade name.

5.12 Suppliers must not place a T Level Mark against a background colour, pattern or picture except as specified below:

- as set out in or referenced in **Annex 1** or as otherwise agreed in writing by IfATE or specified in these Guidelines; or

- with imagery which is of a purely illustrative character, and does not suggest any other source or business connection, and is appropriate to the context and brand identity, and allows the entire mark to be clearly visible more prominently than such imagery, and complies with any other limitations notified by IfATE in writing from time to time,

and in any event any imagery must be consistent with the overall brand identity and values of the T Level Marks and the T Level Programme, and not be liable to bring the T Level Marks or the T Level Programme into disrepute.

Prominence

5.13 Where Suppliers use the T Level Marks on material which carries other branding in conjunction with or in the same part of the material, the T Level Marks should be given at least equal prominence with the other branding. For example:

- it should appear in script of at least the same font size as the script of any Supplier's trade mark, and where Suppliers use a logo covering at least the same overall surface area;
- the style used for the other mark should not lead to it being more prominent than the style used for the T Level Mark;
- the colouring used for the other mark should not draw more attention to it than the T Level Mark; and
- it should appear in at least as prominent a position.

5.14 Typically, use of one T Level Mark will not be regarded as 'in conjunction' with another mark when they are in separate distinct parts of the document, including for example, use of a Supplier's letter head (one part) and use of the T Level Mark in the body of the letter (a separate part).

Acknowledgement

5.15 Subject to paragraph 5.16 of these Guidelines, where the T Level Marks are used in any document, Suppliers should place in the document reasonably prominently (so that it would reasonably be expected to come to the attention of the reader or addressee of the document) an acknowledgement that IfATE's name and logo are registered trade marks of IfATE. For example:

- where the T Level Mark is used in the title or opening description of the document or in a manner intended to show that the document relates to a T Level or a TQ, by using a referenced footnote acknowledging that 'T Level is a registered trade mark of The Institute for Apprenticeships and Technical Education' or 'Registered trade mark of The Institute for Apprenticeships and Technical Education';

- where it is used in the text of a document, the first time it appears it should include a referenced footnote acknowledging that the '[Mark] is a registered trade mark of The Institute for Apprenticeships and Technical Education' or 'Registered trade mark of The Institute for Apprenticeships and Technical Education';

- in each case the referenced footnote should, where practicable, appear in the same visual field as the use of the T Level Marks, or in other cases, where such notice would otherwise commonly be placed. For example, on the rear of a single page which is printed on both sides, on the rear of the front page of a booklet, or on the rear of the last page of a booklet; and

- where a Supplier's or a Provider's name or branding is also used in the document, the referenced footnote should also make clear that the T Level is a qualification approved and managed by IfATE, and that the Supplier is currently authorised by IfATE to develop and deliver the qualification (and/or that the Provider offers or provides courses for part of the T Level, which is a qualification approved and managed by IfATE), as appropriate.

5.16 Where a reference is made to T Level in any document indirectly (for example with a description which is evidently a reference to a T Level or the TQ) in association with a Supplier (whether using a Supplier's name or otherwise), the document should make clear that the T Level and a TQ is a qualification approved and managed by IfATE.

5.17 No further acknowledgement is necessary where the use of the T Level Marks or a reference to a T Level or TQ is in a document, other than those materials/document listed in **Annex 2** of these Guidelines. To illustrate: such use is in word form (as part of the text[2]) of the document and would clearly be understood by addressees and readers as being a reference to the T Level or, as appropriate and reference has been to the fact that the TQ is approved and managed by IfATE and it is not being suggested otherwise: it has been made clear that the role of the Supplier is focused on developing and/or delivering the TQ component of the T Level and it has a relationship with IfATE.

Illustrations

The approach may be adjusted sensibly for the particular materials and circumstances of use. For example:

5.18 On promotional documentation intended for Providers, where it might be expected that a high level of prominence would be given to a Supplier's name or branding (for example in large

[2] including spoken text in the case of spoken material

script), or on explanatory documentation intended for Providers, the use of T Level (and T Level Marks, including text marks) should be given equal prominence. In a referenced footnote should appear on the reverse of the first page (for example with other similar notices, such as copyright notices, but no less prominently than those notices);

5.19 For promotional and explanatory documentation aimed at students or employers, the use of T Level should be given equal prominence; and a clear note should appear on the same page in the same visual field that the T Level is a qualification approved and managed by IfATE, and a Supplier's development and delivery of the qualification and use of the mark is under the authority of IfATE;

5.20 For assessment or examination papers (for single use) relating to materials for examiners, a reasonably prominent note should appear at the bottom of the first page that the T Level is a qualification approved and managed by IfATE, and a Supplier's development and delivery of the qualification and use of the mark is under the authority of IfATE;

5.21 For sample papers which may be re-used, there should in addition be a note that T Level is a registered trade mark of IfATE; and

5.22 For any supplementary materials (such as text books and learning aids), other than those materials/ documents listed in Annex 2, there should be a clear reasonably prominent explanation that the material is designed for use with the relevant T Level; including the date of the T Level, and that the T Level is a qualification approved and managed by IfATE, and that the T Level is a registered trade mark of IfATE used by a Supplier (or other source) with the authority of IfATE.

Providers (Schools and Colleges)

5.23 Suppliers are responsible for ensuring that:

- each Provider complies with these marking requirements, as they apply to use of a Supplier's name or branding and equally, to any permitted use of the Provider's name or branding in association with the T Level Mark; and
- any use by a Provider of the T Level Mark is clearly a reference to a T Level approved and managed by IfATE.

6 Inspection and Approval

6.1 Suppliers must permit IfATE to inspect on reasonable request and on reasonable notice any materials bearing or intended to bear a T Level Mark, for the purposes of ascertaining compliance with these Guidelines.

6.2 Where IfATE determines (acting reasonably) that it appears that there is a non-compliance with these Guidelines, Suppliers must consult with IfATE on how such non-compliance may be remedied, taking into account both the seriousness of the non-compliance, including how the relevant material does not comply, what the potential impact may be (bearing in mind the volumes of material in question and the audience for those materials) and the potential impact of remedial steps, with a view to reaching fair and reasonable consensus on remedial action (which may range from taking steps in relation to future materials to the withdrawal and reissue of current materials).

6.3 In the event that no consensus can be reached, the disagreement or difference will be subject to the Dispute Resolution Procedure.

7 Amendments to the Guidelines

7.1 IfATE may amend these Guidelines from time to time, in a manner consistent with the general principles (Section 2).

7.2 IfATE will notify Suppliers of any changes together with the date on which such amendments are to take effect.

7.3 IfATE will take reasonable account of Suppliers' comments or concerns in relation to any amendments and the timetable for implementation, and Suppliers agree to act reasonably to seek a consensus. In the absence of consensus the disagreement or difference may be referred by Suppliers or IfATE to be resolved under the Dispute Resolution Procedure, as set out in Annex 4.

Annex 1 (a): T Level Marks on Mandatory Marked TQ materials

Front page

*

*to be placed top right within the header

Supplier logo]**

**to be placed bottom right within the footer

Final page

Annex 1 (b): T Level Marks on Marked TQ materials

Front page

T-LEVELS*

*to be placed top right within the header

[Supplier logo]**

**to be placed bottom right within the footer

Final page

Annex 2: Mandatory Marked Materials

Key Materials

a) specifications of content for each TQ including core and all specialist components;
b) assessment guidelines (for Providers);
c) quality assurance requirements (for Providers);
d) specimen assessment materials;
e) standards exemplification materials;
f) updates or redevelopments of specifications of content;
g) updates and redevelopments of any Key Materials; and
h) any materials equivalent to the above to which a Skilled Future Supplier would reasonably require access for the Portability Purposes.

Key Materials shall **not** include support Materials, insofar as they are not part of any of the expressly included items listed above;

Ancillary Materials

a) Assessment Strategy;

Annex 3: Brand Licensed Products and Services

Marketing materials relating to T Levels

Suppliers will be expected to adhere to the form of branding as set out in Annex 1 wherever reasonably practicable.

Annex 4: Dispute Resolution Procedure

Definitions[3]

"**Dispute**" means any claim, dispute or difference which arises out of or in connection with these Guidelines or in connection with the existence, legal validity or enforceability of these Guidelines, whether the alleged liability shall arise under English law or under the law of some other country and regardless of whether a particular cause of action may successfully be brought in the English courts.

"**Style**" means any matter set out in or referred to in paragraph 5 of the Guidelines.

"**Dispute Resolution Procedure**" means the dispute resolution procedure set out in paragraphs 1.1 to 1.5.

1 Resolving disputes

1.1 Where a Dispute (not being a Dispute arising solely in respect of Style):

1.1.1 arises solely between IfATE and a Supplier, the dispute resolution procedure set out in clause 37 of the Supplier's Contract shall apply and the provisions of this Dispute Resolution Procedure shall not apply; or

1.1.2 relates to or is in connection with a dispute that is progressing under the Supplier's Contract, the parties agree to be bound by the decision that is reached in accordance with the dispute resolution procedure set out in clause 37 of the Supplier's Contract in respect of the dispute under the Supplier's Contract, provided always that IfATE and/or the Supplier (as the case may be) have taken into account all reasonable comments and/or submissions of any third party who is a party to, or connected with, the Dispute.

1.2 Where the Dispute is one to which the circumstances described in paragraph 1.1 do not apply:

1.2.1 and the Dispute remains unresolved, the relevant parties connected with the Dispute shall procure that nominated senior representatives of each such party who have authority to settle the Dispute will, within 28 days of a written request from another connected party, meet in good faith to resolve the Dispute; and

1.2.2 if the Dispute is not resolved at that meeting, the relevant parties can attempt to settle it by mediation using the Centre for Effective Dispute Resolution ("**CEDR**") Model Mediation Procedure current at the time of the Dispute. If the relevant parties

cannot agree on a mediator, the mediator with experience in trade mark law will be nominated by CEDR. If a relevant party does not wish to use, or continue to use mediation, or mediation does not resolve the Dispute:

(i) the Dispute (other than a Dispute relating to Style) must be resolved using paragraphs 1.3 to 1.5; or

(ii) a Dispute relating to Style must be resolved using paragraph 1.6.

1.3 Unless IfATE refers the Dispute (other than a Dispute relating to Style) to arbitration using paragraph 1.4, the parties irrevocably agree that the courts of England and Wales have the exclusive jurisdiction (other than in relation to a Dispute relating to Style) to:

1.3.1 determine the Dispute; and/or

1.3.2 grant interim remedies, or any other provisional or protective relief.

1.4 The parties agree that IfATE has the exclusive right to refer any Dispute (other than a Dispute relating to Style) to be finally resolved by arbitration under the London Court of International Arbitration Rules current at the time of the Dispute. There will be only one arbitrator. The seat or legal place of the arbitration will be London and the proceedings will be in English.

1.5 IfATE has the right to refer a Dispute (other than a Dispute relating to Style) to arbitration even if a party has started or has attempted to start court proceedings under paragraph 1.3, unless IfATE has agreed to the court proceedings or participated in them. Even if court proceedings have started, the relevant party must do everything necessary to ensure that the court proceedings are stayed in favour of any arbitration proceedings if they are started under paragraph 1.4.

1.6 If the Dispute is one which relates to Style, IfATE's decision will be final.

Schedule 16 Appendix 2

Mark

T Level

Registered trademark(s) and applications[3]

Country	Mark	App or regn no	Date of app or regn	Classes	Specification
UK	T Level (word)	UK00003318112	15 June 2018	9, 16, 41	Class 9: Electronic apparatus and instruments for testing, examination and assessment purposes; computer software, hardware and firmware for the provision of examination and assessments including software for operation over computer networks or by remote computer access; all of the aforesaid for use in the provision of education, teaching, training and/or assessment. Class 16: Examination papers; syllabi; diplomas; education, academic and vocational certificates; printed examination regulations; all of the aforesaid for use in the provision of education, teaching, training and/or assessment.

					Class 41: Issuing of educational awards; awarding of educational certificates; educational assessment services; provision of examination, testing and assessment services; provision of examination, testing and assessment services electronically, by online delivery, by way of the Internet or world wide web; online publication of syllabi, examination papers, assessments; examination services; assessment services; educational certification services; certification in relation to examinations and other forms of assessment; preparation and validation, accreditation, conducting and administration of examinations, assessments and tests; provision of examination papers; information, advisory and consultancy services relating to all of the aforesaid; all of the aforesaid relating to the provision of education, teaching, training and/or assessment.

EU	T Level (word)	017999579	13 December 2018	9, 16, 41	Class 9: Educational, teaching, instruction or research apparatus and instruments; electronic apparatus and instruments for teaching, instruction, training, research, education, testing, examination and assessment purposes; media bearing electronic publications and data; electronic publications; electronic publications (downloadable) provided online from a database or the Internet; downloadable text and information provided electronically, by online delivery, by way of the Internet or world wide web; electronic database; audio visual teaching apparatus; films and video films; computer software, hardware and firmware; computer software, hardware and firmware for the provision of teaching, instruction, training, research, education, testing, examination and assessments including software for operation over computer networks or by remote computer access; educational software; all of the aforesaid for use in the provision of education, teaching, training and/or assessment. Class 16: Printed publications; educational publications; printed matter; educational materials; examination papers; syllabi; diplomas; education, academic and vocational certificates; printed examination regulations; books; magazines; publications; textbooks; exercise books and notebooks; catalogues, handbooks and manuals; study guides; instructional or teaching materials; all of the aforesaid for use in the provision of education, teaching, training and/or assessment.

					Class 41: Education services; teaching services; publication services; educational publication services; publication of printed matter relating to education; issuing of educational awards; awarding of educational certificates; electronic publication; publication of printed matter; educational assessment services; provision of training, teaching, academic, education, instruction, examination, testing and assessment services; provision of training, teaching, academic, education, instruction, examination, testing and assessment services electronically, by online delivery, by way of the Internet or world wide web; online publication of electronic texts, books, textbooks, brochures, syllabi, examination papers, assessments; examination services; assessment services; educational certification services; certification in relation to examinations and other forms of assessment, education, training and awards; preparation and validation, accreditation, conducting and administration of examinations, assessments and tests; provision of examination papers; information, advisory and consultancy services relating to all of the aforesaid services; all of the aforesaid relating to the provision of education, teaching, training and/or assessment services.

Schedule 17

Provider Contract requirements

1 Provider Contract

1.1 This Schedule sets out the requirements that Provider Contracts must meet.

1.2 Provider Contracts must:

1.2.1 be in writing, enforceable, and on terms that are fair and reasonable;

1.2.2 set out all the requirements with which the Approved Provider must comply in order to continue to deliver the TQ;

1.2.3 establish a sanctions policy to be applied in the event that the Approved Provider fails to comply with the requirements in the Provider Contract;

1.2.4 require the Approved Provider to:

(i) take all reasonable steps to ensure that the Supplier is able to comply with its Conditions of Recognition;

(ii) retain a workforce of appropriate size and competence to undertake the delivery of the TQ as required by the Supplier;

(iii) have available sufficient managerial and other resources to enable it effectively and efficiently to undertake the delivery of the TQ as required by the Supplier;

(iv) undertake the delivery of the qualification required by the awarding organisation in accordance with the Equality Act 2010, any Act that was a statutory predecessor to that Act, or any legislation in a jurisdiction other than England which has an equivalent purpose and effect; and

(v) operate a complaints handling procedure or appeals process for the benefit of Students;

1.2.5 where, in accordance with the Approved Assessment Strategy an Approved Provider is permitted to carry out or procure the carrying out

of marking of Student assessment evidence, set out details for carrying out Moderation;

1.2.6 not materially depart from any relevant industry standards and common education sector practices;

1.2.7 be materially consistent across all Approved Providers in respect of the provision of the Provider Services and, in particular, shall not discriminate against any particular types, sizes or geographical locations of Approved Providers in connection with the provision of any Provider Services;

1.2.8 include appropriate GDPR provisions: where the Supplier, in fulfilling its obligations under this Contract, is acting as a Processor on behalf of an Approved Provider, the Provider Contract will include provisions to ensure that any personal data (as defined in the GDPR) that is Processed by the Supplier in relation to the Provider Services is Processed in accordance with Data Protection Legislation;

1.2.9 be consistent with, and to the extent necessary allow for, any information, document and data sharing requirements contained within this Contract (to include any information, documents and data that must be provided by the Supplier to the Authority and/or any third party and any information, documents and data requested by Ofqual);

1.2.10 require the Approved Provider to assist the Supplier in carrying out any reasonable monitoring activities and to assist Ofqual in any investigations made for the purposes of performing its functions;

1.2.11 allow Approved Providers to purchase Provider Services on an “as and when needed” basis without any minimum or maximum volume commitments (including in relation to the number of Students);

1.2.12 require Approved Providers to register all Students on a TQ by the end of November or within such other timescales as are required by the Key Dates Schedule for the relevant Academic Year and pay that part of the Fees referred to in limb (a) of the definition of Fees within 30 days of such registration and provide that, if a Student terminates their study of the TQ before the end of the following January in the same Academic Year, the Supplier must provide a full refund of such Fees (relating to such Student)

to the Approved Provider (for the avoidance of doubt, if the Student terminates their study of the TQ after the end of the following January in the same Academic Year, the Supplier is not obliged to give a refund);

1.2.13 include detailed provisions relating to the Approved Provider's role in quality assurance, such provisions shall give effect to the requirements of the Approved Provider's Quality Assurance Process;

1.2.14 require Approved Providers to provide advice and guidance to Students (including any Student no longer enrolled with the Approved Provider) in relation to making enquiries about results (and any further steps that may be taken following such an enquiry (including those contemplated by the Additional Services)) and where such Student reasonably requests the Approval Provider (whether directly or indirectly) to request the provision of an Additional Service, require the Approved Provider to request the provision of such Additional Service from the Supplier;

1.2.15 require Approved Providers to seek written approval from the Supplier before permitting a third party (for example training providers or satellite centres) to deliver any part of the TQ, including its assessments, and requires the Approved Providers to agree in writing to the Supplier's requirements before the Supplier approves the use of a third party;

1.2.16 place responsibility on the Approved Provider to monitor whether any third party involved with the delivery and assessment of the TQ on its behalf has appropriate capacity and capability; and

1.2.17 specify a process to be followed in any withdrawal of the Approved Provider (whether voluntary or not) from its role in delivering the TQ and require Approved Providers to take all reasonable steps to protect the interests of Students in the case of such a withdrawal.

1.3 Provider Contracts must not:

1.3.1 include terms in connection with Provider Services that are not strictly necessary for the provision of the relevant Provider Services and/or which are materially inconsistent with any of the Supplier's obligations under this Contract;

1.3.2 make the provision of the Provider Services contingent on the take up of any

further qualifications or services by the Approved Provider;

1.3.3 require the Approved Provider to make any payments other than the Fees (e.g. for the avoidance of doubt, Provider Contracts shall not require any fees to be paid by the Approved Provider (or an Eligible Provider) for Provider Approval in relation to a TQ);

1.3.4 offer any discounts to the Fees; and/or

1.3.5 include provisions that are materially more onerous than any comparable provisions in this Contract.

1.4 The Supplier shall not offer to any Approved Provider any rebate, discount or other incentive in relation to services outside the Provider Services (whether or not in the Provider Contract) which is contingent on or linked to the Approved Provider entering into the Provider Contract and/or registering Students for the TQ.

Schedule 18

Commercially Sensitive Information

The content for this Schedule is as below:

GEN2 W2 Science Commercially Sensitive and/or Confidential Information

Schedule 19

Required Insurances

PART A: THIRD PARTY PUBLIC AND PRODUCTS LIABILITY INSURANCE

1 Insured

The Supplier

2 Interest

To indemnify the Insured in respect of all sums which the Insured shall become legally liable to pay as damages, including claimant's costs and expenses, in respect of accidental:

2.1 death or bodily injury to or sickness, illness or disease contracted by any person; and

2.2 loss of or damage to property,

happening during the period of insurance (as specified in paragraph 5) and arising out of or in connection with the provision of the Services under this Contract.

3 Limit of indemnity

Not less than £5,000,000 in respect of any one occurrence, the number of occurrences being unlimited, but £5,000,000 in the aggregate per annum in respect of products and pollution liability.

4 Territorial limits

United Kingdom.

5 Period of insurance

From the Effective Date and renewable on an annual basis unless agreed otherwise by the Authority in writing for the Term.

6 Cover features and extensions

Indemnity to principals clause.

7 Principal exclusions

7.1 War and related perils.

7.2 Nuclear and radioactive risks.

7.3 Liability for death, illness, disease or bodily injury sustained by employees of the Insured during the course of their employment.

7.4 Liability arising out of the use of mechanically propelled vehicles whilst required to be compulsorily insured by applicable Law in respect of such vehicles.

7.5 Liability in respect of predetermined penalties or liquidated damages imposed under any contract entered into by the Insured.

7.6 Liability arising out of technical or professional advice other than in respect of death or bodily injury to persons or damage to third party property.

7.7 Liability arising from the ownership, possession or use of any aircraft or marine vessel.

7.8 Liability arising from seepage and pollution unless caused by a sudden, unintended and unexpected occurrence.

8 Maximum deductible threshold

Not to exceed £10,000 for each and every third party property damage claim (personal injury claims to be paid in full).

PART B: PROFESSIONAL INDEMNITY INSURANCE

1 Insured

The Supplier

2 Interest

To indemnify the Insured for all sums which the Insured shall become legally liable to pay (including claimants' costs and expenses) as a result of claims first made against the Insured during the period of insurance (as specified in paragraph 5) by reason of any negligent act, error and/or omission arising from or in connection with the provision of the Services.

3 Limit of indemnity

Not less than £5,000,000 in respect of any one claim and in the aggregate per annum, exclusive of defence costs which are payable in addition.

4 Territorial Limits

United Kingdom

5 Period of insurance

From the Effective Date and renewable on an annual basis unless agreed otherwise by the Authority in writing (a) for the Term; and (b) for a period of 6 years thereafter.

6 Cover features and extensions

Retroactive cover to apply to any “claims made policy wording” in respect of this Contract or retroactive date to be no later than the Effective Date.

7 Principal exclusions

7.1 War and related perils

7.2 Nuclear and radioactive risks

8 Maximum deductible threshold

Not to exceed £10,000 for each and every claim.

PART C: UNITED KINGDOM COMPULSORY INSURANCES

1 The Supplier shall meet its insurance obligations under applicable Law in full, including, UK employers' liability insurance and motor third party liability insurance.

Schedule 20

Authorised Representatives

The content for this Schedule is as below:

GEN2 W2 Science Authorised Representatives

Schedule 21

Staff Transfer

1. **Definitions**

1.1 In this Schedule, the following definitions shall apply:

"Former Supplier" means the Awarding Organisation that is operating or operated the T Level technical education qualification under the Original Contract;

"Notified Sub-contractor" means a Sub-contractor to whom Transferring Former Supplier Employees will transfer on a Relevant Transfer Date;

"Replacement Sub-contractor" means a sub-contractor of the Replacement Supplier to whom Transferring Supplier Employees will transfer on a Service Transfer Date (or any sub-contractor of any such sub-contractor);

"Relevant Transfer" means a transfer of employment to which TUPE applies;

"Relevant Transfer Date" means in relation to a Relevant Transfer, the date upon which the Relevant Transfer takes place;

"Service Transfer" means any transfer of the Services (or any part of the Services), for whatever reason, from the Supplier or any Sub-contractor to a Replacement Supplier or a Replacement Sub-contractor;

"Service Transfer Date" means the date of a Service Transfer;

"Staffing Information" means in relation to all persons identified on the Supplier's Provisional Supplier Personnel List or Supplier's Final Supplier Personnel List, as the case may be, such information as the Authority may reasonably request (subject to all applicable provisions of the Data Protection Legislation), but including in an anonymised format:

(a) their ages, dates of commencement of employment or engagement, gender and place of work;

(b) details of whether they are employed, self-employed contractors or consultants, agency workers or otherwise;

(c) the identity of the employer or relevant contracting Party;

(d) their relevant contractual notice periods and any other terms relating to termination of employment, including redundancy procedures, and redundancy payments;

(e) their wages, salaries, bonuses and profit sharing arrangements as applicable;

(f) details of other employment-related benefits, including (without limitation) medical insurance, life assurance, pension or other retirement benefit schemes, share option schemes and company car schedules applicable to them;

(g) any outstanding or potential contractual, statutory or other liabilities in respect of such individuals (including in respect of personal injury claims);

(h) details of any such individuals on long term sickness absence, parental leave, maternity leave or other authorised long term absence;

(i) copies of all relevant documents and materials relating to such information, including copies of relevant contracts of employment (or relevant standard contracts if applied generally in respect of such employees); and

(j) any other Employee Liability Information" as such term is defined in regulation 11 of TUPE;

"Supplier's Final Supplier Personnel List" means a list provided by the Supplier of all Supplier Personnel who will transfer under TUPE on the Service Transfer Date;

"Supplier's Provisional Supplier Personnel List" means a list prepared and updated by the Supplier of all Supplier Personnel who are at the date of the list wholly or mainly engaged in or assigned to the provision of the Services or any relevant part of the Services which it is envisaged as at the date of such list will no longer be provided by the Supplier;

"Transferring Former Supplier Employees" means in relation to a Former Supplier, those employees of the Former Supplier to whom TUPE will apply on the Relevant Transfer Date; and

"Transferring Supplier Employees" means those employees of the Supplier and/or the Supplier's Sub-contractors to whom TUPE will apply on the Service Transfer Date.

2. Interpretation

2.1 Where a provision in this Schedule imposes an obligation on the Supplier to provide an indemnity, undertaking or warranty, the Supplier shall procure that each of its Sub-

contractors shall comply with such obligation and provide such indemnity, undertaking or warranty to the Authority, Former Supplier, Replacement Supplier or Replacement Sub-contractor, as the case may be.

Transferring Former Supplier Employees at Commencement of Services

3. Relevant Transfers

3.1 The Authority and the Supplier agree that:

3.1.1 the commencement of the provision of the Services or of any relevant part of the Services will be a Relevant Transfer in relation to the Transferring Former Supplier Employees; and

3.1.2 as a result of the operation of TUPE, the contracts of employment between each Former Supplier and the Transferring Former Supplier Employees (except in relation to any terms disapplied through the operation of regulation 10 of TUPE) shall have effect on and from the Relevant Transfer Date as if originally made between the Supplier and/or Notified Sub-contractor and each such Transferring Former Supplier Employee.

3.2 The Authority shall procure that each Former Supplier shall comply with all its obligations under TUPE and shall perform and discharge all its obligations in respect of all the Transferring Former Supplier Employees in respect of the period up to (but not including) the Relevant Transfer Date (including the payment of all remuneration, benefits, entitlements and outgoings, all wages, accrued but untaken holiday pay, bonuses, commissions, payments of PAYE, national insurance contributions and pension contributions which in any case are attributable in whole or in part in respect of the period up to (but not including) the Relevant Transfer Date) and the Supplier shall make, and the Authority shall procure that each Former Supplier makes, any necessary apportionments in respect of any periodic payments.

4. Former Supplier Indemnities

4.1 Subject to paragraph 4.2, the Authority shall procure that each Former Supplier shall indemnify the Supplier and any Notified Sub-contractor against any Employee Liabilities arising from or as a result of:

4.1.1 any act or omission by the Former Supplier in respect of any Transferring Former Supplier Employee or any appropriate employee representative (as

defined in TUPE) of any Transferring Former Supplier Employee arising before the Relevant Transfer Date;

4.1.2 the breach or non-observance by the Former Supplier arising before the Relevant Transfer Date of:

(a) any collective agreement applicable to the Transferring Former Supplier Employees; and/or

(b) any custom or practice in respect of any Transferring Former Supplier Employees which the Former Supplier is contractually bound to honour;

4.1.3 any proceeding, claim or demand by HMRC or other statutory authority in respect of any financial obligation including, but not limited to, PAYE and primary and secondary national insurance contributions:

(a) in relation to any Transferring Former Supplier Employee, to the extent that the proceeding, claim or demand by HMRC or other statutory authority relates to financial obligations arising before the Relevant Transfer Date; and

(b) in relation to any employee who is not a Transferring Former Supplier Employee and in respect of whom it is later alleged or determined that TUPE applied so as to transfer his/her employment from the Former Supplier to the Supplier and/or any Notified Sub-contractor as appropriate, to the extent that the proceeding, claim or demand by HMRC or other statutory authority relates to financial obligations in respect of the period to (but excluding) the Relevant Transfer Date;

4.1.4 a failure of the Former Supplier to discharge or procure the discharge of all wages, salaries and all other benefits and all PAYE tax deductions and national insurance contributions relating to the Transferring Former Supplier Employees in respect of the period to (but excluding) the Relevant Transfer Date;

4.1.5 any claim made by or in respect of any person employed or formerly employed by the Former Supplier other than a Transferring Former Supplier Employee for whom it is alleged the Supplier and/or any Notified Sub-contractor as appropriate may be liable by virtue of this Contract and/or TUPE; and

4.1.6 any claim made by or in respect of a Transferring Former Supplier Employee or any appropriate employee representative (as defined in TUPE) of any Transferring Former Supplier Employee relating to any act or omission of the Former Supplier in relation to its obligations under regulation 13 of TUPE, except to the extent that the liability arises from the failure by the Supplier or any Sub-contractor to comply with regulation 13(4) of TUPE.

4.2 The indemnities in Paragraph 4.1 shall not apply to the extent that the Employee Liabilities arise or are attributable to an act or omission of the Supplier or any Sub-contractor whether occurring or having its origin before, on or after the Relevant Transfer Date including, without limitation, any Employee Liabilities:

4.2.1 arising out of the resignation of any Transferring Former Supplier Employee before the Relevant Transfer Date on account of substantial detrimental changes to his/her working conditions proposed by the Supplier or any Sub-contractor to occur in the period from (and including) the Relevant Transfer Date; or

4.2.2 arising from the failure by the Supplier and/or any Sub-contractor to comply with its obligations under TUPE.

4.3 If any person who is not identified as a Transferring Former Supplier Employee claims, or it is determined in relation to any person who is not identified as a Transferring Former Supplier Employee, that his/her contract of employment has been transferred from a Former Supplier to the Supplier and/or any Notified Sub-contractor pursuant to TUPE then:

4.3.1 the Supplier shall, or shall procure that the Notified Sub-contractor shall, within 5 Working Days of becoming aware of that fact, give notice in writing to the Authority and, where required by the Authority, to the Former Supplier; and

4.3.2 the Former Supplier may offer (or may procure that a third party may offer) employment to such person within 15 Working Days of the notification by the Supplier and/or the Notified Sub-contractor or take such other reasonable steps as the Former Supplier considers appropriate to deal with the matter provided always that such steps are in compliance with applicable Law.

4.4 If an offer referred to in paragraph 4.3.2 is accepted, or if the situation has otherwise been resolved by the Former Supplier and/or the Authority, the Supplier shall, or shall

procure that the Notified Sub-contractor shall, immediately release the person from his/her employment or alleged employment.

4.5 If by the end of the 15 Working Day period specified in paragraph 4.3.2:

4.5.1 no such offer of employment has been made;

4.5.2 such offer has been made but not accepted; or

4.5.3 the situation has not otherwise been resolved,

the Supplier and/or any Notified Sub-contractor may within 5 Working Days give notice to terminate the employment or alleged employment of such person.

4.6 Subject to the Supplier and/or any Notified Sub-contractor acting in accordance with the provisions of paragraphs 4.3 to 4.5 and in accordance with all applicable proper employment procedures set out in Law, the Authority shall procure that the Former Supplier indemnifies the Supplier and/or any Notified Sub-contractor (as appropriate) against all Employee Liabilities arising out of the termination of employment pursuant to the provisions of paragraph 4.5 provided that the Supplier takes, or shall procure that the Notified Sub-contractor takes, all reasonable steps to minimise any such Employee Liabilities.

4.7 The indemnity in paragraph 4.6:

4.7.1 shall not apply to:

(a) any claim for:

(b) discrimination, including on the grounds of sex, race, disability, age, gender reassignment, marriage or civil partnership, pregnancy and maternity or sexual orientation, religion or belief; or

(c) equal pay or compensation for less favourable treatment of part-time workers or fixed-term employees;

(d) in any case in relation to any alleged act or omission of the Supplier and/or any Sub-contractor; or

(e) any claim that the termination of employment was unfair because the Supplier and/or Notified Sub-contractor neglected to follow a fair dismissal procedure; and

4.7.2 shall apply only where the notification referred to in paragraph 4.3.1 is made by the Supplier and/or any Notified Sub-contractor (as appropriate) to the

Authority and, if applicable, the Former Supplier, within 6 months of the Relevant Transfer Date.

4.8 If any such person as is described in paragraph 4.3 is neither re-employed by the Former Supplier nor dismissed by the Supplier and/or any Notified Sub-contractor within the time scales set out in paragraph 4.5, such person shall be treated as having transferred to the Supplier or Notified Sub-contractor and the Supplier shall comply with such obligations as may be imposed upon it under the Law.

5. <u>Supplier Indemnities and Obligations</u>

5.1 Subject to paragraph 5.2, the Supplier shall indemnify the Authority and/or the Former Supplier against any Employee Liabilities arising from or as a result of:

5.1.1 any act or omission by the Supplier or any Sub-contractor in respect of any Transferring Former Supplier Employee or any appropriate employee representative (as defined in TUPE) of any Transferring Former Supplier Employee whether occurring before, on or after the Relevant Transfer Date;

5.1.2 the breach or non-observance by the Supplier or any Sub-contractor on or after the Relevant Transfer Date of:

(a) any collective agreement applicable to the Transferring Former Supplier Employee; and/or

(b) any custom or practice in respect of any Transferring Former Supplier Employees which the Supplier or any Sub-contractor is contractually bound to honour;

5.1.3 any claim by any trade union or other body or person representing any Transferring Former Supplier Employees arising from or connected with any failure by the Supplier or a Sub-contractor to comply with any legal obligation to such trade union, body or person arising on or after the Relevant Transfer Date;

5.1.4 any proposal by the Supplier or a Sub-contractor prior to the Relevant Transfer Date to make changes to the terms and conditions of employment or working conditions of any Transferring Former Supplier Employees to their material detriment on or after their transfer to the Supplier or a Sub-contractor (as the case may be) on the Relevant Transfer Date, or to change the terms and conditions of employment or working conditions of any person who would have been a Transferring Former Supplier Employee but for their resignation

(or decision to treat their employment as terminated under regulation 4(9) of TUPE) before the Relevant Transfer Date as a result of or for a reason connected to such proposed changes;

5.1.5 any statement communicated to or action undertaken by the Supplier or a Sub-contractor to, or in respect of, any Transferring Former Supplier Employee before the Relevant Transfer Date regarding the Relevant Transfer which has not been agreed in advance with the Authority and/or the Former Supplier in writing;

5.1.6 any proceeding, claim or demand by HMRC or other statutory authority in respect of any financial obligation including, but not limited to, PAYE and primary and secondary national insurance contributions:

(a) in relation to any Transferring Former Supplier Employee, to the extent that the proceeding, claim or demand by HMRC or other statutory authority relates to financial obligations arising on or after the Relevant Transfer Date; and

(b) in relation to any employee who is not a Transferring Former Supplier Employee, and in respect of whom it is later alleged or determined that TUPE applied so as to transfer his/her employment from the Former Supplier to the Supplier or a Sub-contractor, to the extent that the proceeding, claim or demand by the HMRC or other statutory authority relates to financial obligations arising on or after the Relevant Transfer Date;

5.1.7 a failure of the Supplier or any Sub-contractor to discharge or procure the discharge of all wages, salaries and all other benefits and all PAYE tax deductions and national insurance contributions relating to the Transferring Former Supplier Employees in respect of the period from (and including) the Relevant Transfer Date;

5.1.8 any claim made by or in respect of a Transferring Former Supplier Employee or any appropriate employee representative (as defined in TUPE) of any Transferring Former Supplier Employee relating to any act or omission of the Supplier or any Sub-contractor in relation to obligations under regulation 13 of TUPE, except to the extent that the liability arises from the Former Supplier's failure to comply with its obligations under regulation 13(4) of TUPE; and

5.1.9 a failure by the Supplier or any Sub-Contractor to comply with its obligations under paragraph 2.8 above.

5.2 The indemnities in Paragraph 5.1 shall not apply to the extent that the Employee Liabilities arise or are attributable to an act or omission of the Former Supplier whether occurring or having its origin before, on or after the Relevant Transfer Date including, without limitation, any Employee Liabilities arising from the Former Supplier's failure to comply with its obligations under TUPE.

5.3 The Supplier shall comply, and shall procure that each Sub-contractor shall comply, with all its obligations under TUPE (including without limitation its obligation to inform and consult in accordance with regulation 13 of TUPE) and shall perform and discharge, and shall procure that each Sub-contractor shall perform and discharge, all its obligations in respect of all the Transferring Former Supplier Employees, on and from the Relevant Transfer Date (including the payment of all remuneration, benefits, entitlements and outgoings, all wages, accrued but untaken holiday pay, bonuses, commissions, payments of PAYE, national insurance contributions and pension contributions and any other sums due under the Admission Agreement which in any case are attributable in whole or in part to the period from (and including) the Relevant Transfer Date) and any necessary apportionments in respect of any periodic payments shall be made between the Supplier and the Former Supplier.

6. Information

6.1 The Supplier shall, and shall procure that each Sub-contractor shall, promptly provide to the Authority and/or at the Authority's direction, the Former Supplier, in writing such information as is necessary to enable the Authority and/or the Former Supplier to carry out their respective duties under regulation 13 of TUPE. The Authority shall procure that the Former Supplier shall promptly provide to the Supplier and each Notified Sub-contractor in writing such information as is necessary to enable the Supplier and each Notified Sub-contractor to carry out their respective duties under regulation 13 of TUPE.

7. Procurement Obligations

7.1 Notwithstanding any other provisions of this Schedule, where in this Schedule the Authority accepts an obligation to procure that a Former Supplier does or does not do something, such obligation shall be limited so that it extends only to the extent that the Authority's contract with the Former Supplier contains a contractual right in that regard which the Authority may enforce, or otherwise so that it requires only that the

Authority must use reasonable endeavours to procure that the Former Supplier does or does not act accordingly.

8. Pensions

8.1 The Supplier shall, and shall procure that each Sub-contractor shall, comply with the requirements of Part 1 of the Pensions Act 2008, section 258 of the Pensions Act 2004 and the Transfer of Employment (Pension Protection) Regulations 2005 for all transferring staff.

DATED

THE INSTITUTE FOR APPRENTICESHIPS AND TECHNICAL EDUCATION

and

PEARSON EDUCATION LIMITED

INTELLECTUAL PROPERTY ASSIGNMENT AND LICENCE IN RELATION TO THE HEALTH AND SCIENCE: SCIENCE T LEVEL TECHNICAL QUALIFICATION

THIS ASSIGNMENT AND LICENCE is made on

BETWEEN:

(1) **THE INSTITUTE FOR APPRENTICESHIPS AND TECHNICAL EDUCATION** of Sanctuary Buildings, 20 Great Smith Street, London SW1P 3BT ("**Authority**"); and

(2) **PEARSON EDUCATION LIMITED** a company registered in England and Wales (company registration number: **00872828**), whose registered office is at 80 Strand, London, WC2R 0RL ("**Supplier**"),

each a "**Party**" and together the "**Parties**".

BACKGROUND TO THIS ASSIGNMENT AND LICENCE

(A) The Authority and the Supplier have entered into a contract on the date of this Assignment and Licence for the design, development and delivery of the technical education qualification element ("**TQ**") for the **Science** T Level ("the **TQ Agreement**").

(B) The Supplier has agreed to assign certain intellectual property rights to the Authority, and to licence certain intellectual property rights to the Authority in connection with the TQ. The Authority has agreed to grant a licence back to the Supplier in relation to certain assigned intellectual property rights.

(C) This Assignment and Licence, together with the TQ Agreement sets out the agreed terms of such assignment and licences.

1 Assignment and Licence start, formation and interpretation

1.1 This Assignment and Licence is legally binding from the Effective Date until it ends in accordance with its terms.

1.2 In this Assignment and Licence, unless the context otherwise requires, capitalised expressions shall have the meanings set out in this clause 1 or, where no definition is given in this clause 1, Schedule 1 to the TQ Agreement.

1.3 If a capitalised expression does not have an interpretation in this clause 1 or Schedule 1 to the TQ Agreement, it shall, in the first instance, be interpreted in accordance with the common interpretation within the relevant market sector where appropriate. Otherwise, it shall be interpreted in accordance with the dictionary meaning.

1.4 In this Assignment and Licence, unless the context otherwise requires:

1.4.1 the singular includes the plural and vice versa;

1.4.2 reference to a gender includes the other gender and the neuter;

1.4.3 references to a person include an individual, company, body corporate, Corporation, unincorporated association, firm, partnership or other legal entity or Crown Body;

1.4.4 references to a legal entity (other than the Supplier) shall include unless otherwise expressly stated any statutory successor to such entity and/or the relevant functions of such entity, and references to the Department shall include, where relevant, the ESFA;

1.4.5 a reference to any Law includes a reference to that Law as amended, extended, consolidated or re-enacted from time to time;

1.4.6 the words "**including**", "**other**", "**in particular**", "**for example**" and similar words shall not limit the generality of the preceding words and shall be construed as if they were immediately followed by the words "**without limitation**";

1.4.7 references to **"writing"** include typing, printing, lithography, photography, display on a screen, electronic and facsimile transmission and other modes of representing or reproducing words in a visible form, and expressions referring to writing shall be construed accordingly;

1.4.8 references to **"clauses"** and **"Schedules"** are, unless otherwise provided, references to the clauses and schedules of the Assignment and Licence and references in any Schedule to parts, paragraphs, annexes and tables are, unless otherwise provided, references to the parts, paragraphs, annexes and tables of the Schedule in which these references appear;

1.4.9 references to **"paragraphs"** are, unless otherwise provided, references to the paragraph of the appropriate Schedule unless otherwise provided; and

1.4.10 the headings in the Assignment and Licence are for ease of reference only and shall not affect the interpretation or construction of this Agreement and Licence.

1.5 In this Assignment and Licence, unless the context otherwise requires, the following words shall have the following meanings:

"**Ancillary Materials**" means all information and materials (other than Key Materials) to which the Authority and/or a Future Supplier would require access for the Portability Purposes, and any other materials which would be required on or to facilitate succession to a Future Supplier in a seamless manner in relation to the TQ offered or Operated by the Supplier.

Ancillary Materials shall include, without limitation:

(a) Student results including grades;

(b) statistical analysis for grading (excludes the systems supporting the analysis);

(c) lists of Providers;

(d) marked Student evidence (with moderation outcomes);

(e) documentation which provides an overview or analysis of Student performance (including chief examiner and chief moderator reports), which include but are not limited to, examples of student responses to assessment questions and/or tasks as well as narrative explaining why students did well/ less well on individual items/ components/ subcomponents);

(f) data on Student credits;

(g) data on Student appeals;

(h) data on special considerations for Students;

(i) the Assessment Strategy;

(j) Student registrations;

(k) draft materials in preparation for forthcoming assessments;

(l) the Key Dates Schedule (in respect of forthcoming assessments);

(m) lists, with contact details, of people contracted by the Supplier to perform or oversee activities which are necessary for the conduct and quality assurance of assessments for the TQ;

(n) materials from completed assessments, such as completed Students' examination answer booklets; and

(o) TQ Live Assessment Materials

"**Approval**" has the same meaning as in the TQ Agreement;

"**Assigned Rights**" means the Intellectual Property Rights in the Key Materials;

"**Authority Authorised Representative**" has the same meaning as in the TQ Agreement;

"**Background IPR**" means any IPR owned by a Party prior to the Effective Date or created or developed by a Party otherwise than in the provision of the Services or under or in connection with the TQ Agreement, but does not include IPR in Key Materials;

"**Beneficiary**" means a Party having (or claiming to have) the benefit of an indemnity under this Assignment and Licence;

"**Claim**" means any claim for which it appears that a Beneficiary is, or may become, entitled to indemnification under this Assignment and Licence;

"**Continuing Activities**" means activities of the Supplier under the TQ Agreement which continue following the end of the second Academic Year for the final Exclusive Cohort (each as defined in the TQ Agreement) in relation to the TQ as offered by the Supplier, such as retakes, appeals, and any ongoing records management contracted to the Supplier;

"**Default**" means any breach of the obligations of the Supplier (including abandonment of the Assignment and Licence in breach of its terms) or any other default (including material default), act, omission, negligence or statement of the Supplier, of its Subcontractors or any Supplier Staff howsoever arising in connection with or in relation to the subject-matter of this Assignment and Licence and in respect of which the Supplier is liable to the Authority;

"**Deliverables**" means all information and data the Supplier creates, identifies for use, or uses as part of or for the Operation of the TQ, including Products and Management Information;

"**Dispute**" means any claim, dispute or difference which arises out of or in connection with this Assignment and Licence or in connection with the negotiation, existence, legal validity, enforceability or termination of this Assignment and Licence, whether the alleged liability shall arise under English law or under the law of some other country and regardless of whether a particular cause of action may successfully be brought in the English courts;

"**Effective Date**" means the date on which the last Party to sign has signed this Assignment and Licence;

"**Final Approval Milestone**" has the meaning given in the TQ Agreement;

"**Future Supplier**" means any Awarding Organisation appointed, at any point in the future and including any Replacement Supplier, to operate one or more T Level technical education qualifications by or at the direction of the Authority from time to time, and where the Authority is operating a T Level technical education qualification, shall also include the Authority;

"**Indemnifier**" means a Party from whom an indemnity is sought under this Assignment and Licence;

"**Insolvency Event**" means:

(a) in respect of a company:

(i) a proposal is made for a voluntary arrangement within Part I of the Insolvency Act 1986 or of any other composition scheme or arrangement with, or assignment for the benefit of, its creditors; or

(ii) a shareholders' meeting is convened for the purpose of considering a resolution that it be wound up or a resolution for its winding-up is passed (other than as part of, and exclusively for the purpose of, a bona fide reconstruction or amalgamation); or

(iii) a petition is presented for its winding up (which is not dismissed within fourteen (14) Working Days of its service) or an application is made for the appointment of a provisional liquidator or a creditors' meeting is convened pursuant to section 98 of the Insolvency Act 1986; or

(iv) a receiver, administrative receiver or similar officer is appointed over the whole or any part of its business or assets; or

(v) an application order is made either for the appointment of an administrator or for an administration order, an administrator is appointed, or notice of intention to appoint an administrator is given; or

(vi) it is or becomes insolvent within the meaning of section 123 of the Insolvency Act 1986; or

(vii) being a "**small company**" within the meaning of section 382(3) of the Companies Act 2006, a moratorium comes into force pursuant to Schedule A1 of the Insolvency Act 1986; or

(b) where the person is an individual or partnership, any event analogous to those listed in limbs (a) (i) to (vii) (inclusive) occurs in relation to that individual or partnership; or

(c) any event analogous to those listed in limbs (a) (i) to (vii) (inclusive) occurs under the law of any other jurisdiction;

"**Intellectual Property Rights**" or "**IPR**" means:

(a) copyright, rights related to or affording protection similar to copyright, rights in databases, patents and rights in inventions, semi-conductor topography rights, trade marks, rights in internet domain names and website addresses and other rights in trade or business names, goodwill, designs, Know-How, trade secrets and other rights in Confidential Information;

(b) applications for registration, and the right to apply for registration, for any of the rights listed at (a) that are capable of being registered in any country or jurisdiction; and

(c) all other rights having equivalent or similar effect in any country or jurisdiction;

"**IPR Claim**" means any claim of infringement or alleged infringement (including the defence of such infringement or alleged infringement) of any IPR used to provide the Services and/or supply the Products or otherwise provided and/or licensed by the Supplier (or to which the Supplier has provided access) to the Authority in the fulfilment of its obligations under the TQ Agreement or this Assignment and Licence;

"**Key Materials**" means materials the IPR in which the Authority reasonably requires ownership of for the Portability Purposes. Examples of where the Authority may reasonably require ownership include because the Authority or a Future Supplier (or, where relevant, a potential Future Supplier) may need to copy or otherwise reproduce such materials (in whole or in part), to supply or communicate the same, or to be able to control the use (in whole or in part) of such materials by third parties, or to authorise others to do so.

Key Materials shall include:

(a) specifications of content for each TQ including core and all specialist components;

(b) assessment guidelines (for Providers);

(c) quality assurance requirements (for Providers);

(d) specimen assessment materials;

(e) standards exemplification materials;

(f) supplementary specimen assessment materials

(g) employer set project guide exemplar responses

(h) employer set project grade exemplar responses

(i) updates or redevelopments of specifications of content;

(j) updates and redevelopments of any Key Materials; and

(k) any materials equivalent to the above to which a Skilled Future Supplier would reasonably require access for the Portability Purposes.

Key Materials shall not include:

(1) Support Materials, insofar as they are not part of any of the expressly included items listed above;

(2) question banks insofar as they are not part of any of the included items listed above and are not developed for the TQ; and

(3) any systems and platforms used to support the delivery of the TQ, provided that the relevant TQ content or data held in or processed by such systems and/or platforms can be extracted without requiring further processing post-extraction (and the Supplier can demonstrate that they can be so extracted) to enable use of the relevant content and/or data by a Skilled Future Supplier in conjunction with a non-proprietary or generally commercially available system or platform;

"**Know-How**" means all ideas, concepts, schemes, information, knowledge, techniques, methodology, and anything else in the nature of know-how relating to the Services;

"**Law**" means any law, subordinate legislation within the meaning of Section 21(1) of the Interpretation Act 1978, bye-law, enforceable right within the meaning of Section 2 of the European Communities Act 1972, regulation, order, regulatory policy, mandatory guidance or code of practice, judgment of a relevant court of law, or directives or requirements with which the Supplier is bound to comply;

"**Losses**" means all losses, liabilities, damages, costs, expenses (including legal fees), disbursements, costs of investigation, litigation, settlement, judgment, interest and penalties whether arising in contract, tort (including negligence), breach of statutory duty, misrepresentation or otherwise and "**Loss**" shall be interpreted accordingly;

"**New IPR**" means :

(c) IPR in items created by the Supplier (or by a third party on behalf of the Supplier) specifically for the purposes of the TQ Agreement and updates and amendments of these items including (but not limited to) database schema; and/or
(d) IPR in or arising as a result of the performance of the Supplier's obligations under the TQ Agreement and all updates and amendments to the same,

but shall not include any IPR owned by the Supplier prior to the Effective Date;

"**Operate**" in relation to a qualification means to provide the Services or a material part of the Services, or services replacing the Services or a material part of the Services, or of an equivalent character to the Services or a material part of the Services in relation to any other qualification (whether a T Level technical education qualification or not); and "**Operation**" and other cognate terms shall have a corresponding meaning;

"**Party**" means the Authority or the Supplier and "**Parties**" means both of them where the context permits;

"**Product**" has the meaning given in the TQ Agreement;

"**Provider**" means an organisation that has a grant agreement and/or a contract in place with the ESFA to provide qualifications to Students;

"**Replacement Services**" means any services which are substantially similar to any of the Services (including the supply of any Products) and which the Authority receives in substitution

for any of the Services, whether those services are provided by the Authority internally and/or by any third party;

"**Replacement Supplier**" has the meaning given in the TQ Agreement;

"**Required Insurances**" has the meaning given in the TQ Agreement;

"**Services**" means the services as described in Schedule 2 to the TQ Agreement (*Service Requirements*) including any Additional Services as defined in the TQ Agreement;

"**Termination Notice**" means a written notice of termination given by one Party to the other, notifying the Party receiving the notice of the intention of the Party giving the notice to terminate this Assignment and Licence on a specified date and setting out the grounds for termination;

"**Third Party IPR**" means Intellectual Property Rights owned by a third party which is or will be used by the Supplier for the purpose of providing the Services and/or supplying the Products;

"**TQ Agreement**" has the meaning given in recital A (above);

"**Transparent**" means that students and employers will regard the TQ delivered by a Future Supplier as materially the same as the TQ delivered and operated by the (existing) Supplier;

"**Working Day**" means any day other than a Saturday or Sunday or public holiday in England and Wales.

2 Assignment

2.1 Pursuant to and for the consideration set out in the TQ Agreement, the Supplier assigns to the Authority, absolutely with full title guarantee all its right, title and interest in and to all of the Intellectual Property Rights in the Key Materials (which, for the avoidance of doubt, includes the Guide Standard Exemplification Materials) including the right to bring, make, oppose, defend, appeal proceedings, claims or actions and obtain relief (and to retain any damages recovered) in respect of any infringement, or any other cause of action arising from ownership, of any of the Assigned Rights on or after the date of this Assignment and Licence. Such assignment shall take place on the earlier of:

2.1.1 the creation of any relevant materials known to be Key Materials;

2.1.2 the identification by the Supplier of the use of the relevant materials as part of the TQ; and

2.1.3 delivery of the relevant Key Materials to the Authority, or Operation of the TQ by the Supplier.

2.2 With the exception of Guide Standard Exemplification Materials, all Key Materials are relevant course documents for the purposes of section A2D3(4) of the Apprenticeships, Skills, Children and Learning Act 2009, and on approval of the TQ at the Final Approval Milestone and on any subsequent Approval, to the extent that any copyright or any rights in copyright forming part of the Assigned Rights have not then been assigned to and vested absolutely in the Authority, they shall be transferred to the Authority by operation of statute in accordance with section A2IA of the Apprenticeships, Skills, Children and Learning Act 2009. Intellectual Property Rights in the Guide Standard Exemplification Materials is assigned to the Authority by virtue of 2.1 above.

3 Licences to the Authority

3.1 The Supplier hereby grants to the Authority (and the Authority shall have, in addition to any retained rights under clause 13.8 of the TQ Agreement) a non-exclusive, perpetual, royalty-free, irrevocable, transferable worldwide licence to use, exploit and sub-license the IPR in the Ancillary Materials and the Supplier's Background IPR and, in respect of any IPR in Key Materials, in each case to the extent that the same are not at the relevant time vested absolutely in the Authority, as necessary to enable the Authority (and its sub-licensees) to:

3.1.1 use the Key Materials and Ancillary Materials in its administration, approval and oversight of the TQ and other T Level technical education qualifications and to make the same available to others (such as Ofqual) to do the same; and

3.1.2 to use the Key Materials and the Ancillary Materials, and for any Future Supplier or potential Future Supplier to use the Key Materials and the Ancillary Materials:

(iv) for competing or tendering for the delivery and Operation of the TQ and/or any Replacement TQ, during any Transition

Period and following expiry or termination of the TQ Agreement; and

(v) to deliver and Operate the TQ and any Replacement TQ, during any Transition Period and following expiry or termination of the TQ Agreement; and

3.1.3 otherwise to receive and use the Services and the Deliverables and allow any Future Supplier to use the Deliverables; and

3.1.4 to sub-license others to exercise the rights set out in this clause 3.1.

3.2 The Authority agrees that it shall use any Ancillary Materials which fall solely within element (l) of the definition of Ancillary Materials (being "*lists, with contact details, of people contracted by the Supplier to perform or oversee activities which are necessary for the conduct and quality assurance of assessments for the TQ*") only for the purposes of planning for or executing an Emergency Exit.

4 Licence to the Supplier

4.1 The Authority hereby grants to the Supplier, in respect of the Assigned Rights, a worldwide, royalty free, perpetual and irrevocable non-exclusive licence, with the right to sublicense, to use and exploit the IPR in the Key Materials during and after the Term, but not, save as provided in the TQ Agreement, to use the same as part of a T Level, such licence being subject to clauses 13.13 and 13.14 of the TQ Agreement (which for these purposes shall survive any termination or expiry of the TQ Agreement).

5 Warranties and representations

5.1 The Supplier warrants and represents (on the Effective Date and on any relevant assignment or grant of licence taking effect) that:

5.1.1 it is or will be the sole legal and beneficial owner of, and that it owns all the rights and interests in the Assigned Rights no later than the time for assignment specified in clause 2.1 or when they are assigned in accordance with clause 13.2.1 of the TQ Agreement, save for Assigned Rights other than New IPR, in respect of which it has previously notified the Authority and the Authority has agreed in writing that this warranty shall not apply;

5.1.2 where it is not the sole legal and beneficial owner of the Assigned Rights, including the Assigned Rights which are to be used or embodied in any Key Materials, it has established that all owners of such rights consent to their assignment and transfer absolutely to the Authority;

5.1.3 it has all the necessary right and title to grant all the licences granted to the Authority under this Assignment and Licence and the TQ Agreement;

5.1.4 it has not licensed or assigned and of the Assigned Rights other than pursuant to this Assignment and Licence or the TQ Agreement;

5.1.5 the Assigned Rights are free from any security interest, option, mortgage, change or lien;

5.1.6 it is unaware of any infringement or likely infringement of any of the Assigned Rights;

5.1.7 as far as it is aware, all the Assigned Rights are valid and subsisting and there are and have been no claims, challenges, disputes or proceedings, pending or threatened, in relation to the ownership, validity or use of any of the Assigned Rights;

5.1.8 the use of the Key Materials and Ancillary Materials, and exploitation of the Assigned Rights by the Supplier in the provision of the Services and Deliverables or by the Authority in receiving and using the Services and Deliverables or procuring any Replacement Services or by aby Future Supplier in Operating any Replacement Services, will not infringe the rights of any third party; and

5.1.9 the Key Materials are its original work and have not been copied wholly or substantially from any other source.

6 Indemnity

6.1 Subject to clause 19, if there is an IPR Claim, the Supplier indemnifies the Authority against all losses, damages, costs or expenses (including professional fees and fines) incurred as a result.

6.2 If an IPR Claim is made or anticipated, the Supplier must at its own expense and the Authority's sole option, either:

6.2.1 obtain for the Authority the rights in clause 2.1 and 3.1 without infringing any Third Party IPR; or

6.2.2 replace or modify the relevant item with substitutes that do not infringe IPR without adversely affecting the functionality or performance of the Deliverables.

7 Moral rights

7.1 The Supplier shall procure written absolute waivers from all authors of the Key Materials and Ancillary Materials in relation to all their moral rights arising under the Copyright, Designs and Patents Act 1988 in relation to the Key Materials and Ancillary Materials and, as far as is legally possible, any broadly equivalent rights such authors may have in any territory of the world.

8 Ending or extending the Assignment and Licence

8.1 This Assignment and Licence ends if terminated by the Authority for any reason set out in this Assignment and Licence.

8.2 If any of the following events happen, the Authority has the right to immediately Terminate this Assignment and Licence or any of the licences granted under this Assignment and Licence by issuing a Termination Notice to the Supplier (in the latter case specifying the relevant licences):

8.2.1 a Default incapable of remedy;

8.2.2 a Default capable of remedy that us not corrected within 30 days; and

8.2.3 anything occurs which entitles the Authority to terminate the TQ Agreement.

9 Claims against third parties

9.1 The Supplier may take any action it considers appropriate or necessary, subject to the Authority's prior written consent, not to be unreasonably withheld or delayed, if there is a breach, other than in connection with the TQ, by a third party of the Authority's rights in any IPR licensed to the Supplier under clause 4, and the Authority agrees to provide all such assistance as the Supplier may reasonably require (subject to meeting the Authority's reasonably agreed costs and expenses and the Supplier hereby indemnifying the Authority in respect of any loss, damage or liability the Authority incurs by reason of any such action).

10 Further assurance

10.1 At the Authority's expense the Supplier shall, and shall use all reasonable endeavours to procure that any necessary third party shall, promptly execute and deliver such

documents and perform such acts as may reasonably be required for the purpose of giving full effect to this Assignment and Licence and the TQ Agreement, including:

10.1.1 registration of the Authority as applicant or (as applicable) proprietor of the Assigned Rights; and

10.1.2 assisting the Authority in obtaining, defending and enforcing the Assigned Rights, and assisting with any other proceedings which may be brought by or against the Authority against or by any third party relating to the Assigned Rights.

10.2 The Supplier appoints the Authority to be its attorney in its name and on its behalf to execute documents, use the Supplier's name and do all things which are necessary or desirable for the Authority to obtain for itself or its nominee the full benefit of this Assignment and Licence.

10.3 This power of attorney is irrevocable and is given by way of security to secure the performance of the Supplier's obligations under this Assignment and Licence and the proprietary interest of the Authority in the Assigned Rights and so long as such obligations of the Supplier remain undischarged, or the Authority has such interest, the power may not be revoked by the Supplier, save with the consent of the Authority.

10.4 Without prejudice to clause 10.2, the Authority may, in any way it thinks fit and in the name and on behalf of the Supplier:

10.4.1 take any action that this Assignment and Licence requires the Supplier to take;

10.4.2 exercise any rights which this Assignment and Licence gives to the Supplier; and

10.4.3 appoint one or more persons to act as substitute attorney(s) for the Supplier and to exercise such of the powers conferred by this power of attorney as the Authority thinks fit and revoke such appointment.

10.5 The Supplier undertakes to ratify and confirm everything that the Authority and any substitute attorney does or arranges or purports to do or arrange in good faith in exercise of any power granted under this clause 10.

11 <u>How much each Party can be held responsible for</u>

11.1 Each Party's total aggregate liability under this Assignment and Licence (whether in tort, contract or otherwise) for each claim or series of connected claims is no more than £1 million.

11.2 No party is liable to the other for:

11.2.1 any indirect Losses; or

11.2.2 loss if profits, turnover, savings, business opportunities or damage to goodwill (in each case whether direct or indirect)

11.3 The limitation of liability set out in clause 11.1 does not apply to either Party in relation to the following:

11.3.1 its liability for death or personal injury caused by its negligence, or that of its employees, against or subcontractors;

11.3.2 bribery or fraud or fraudulent misrepresentation by it or its employees; or

11.3.3 any liability that cannot be excluded or permitted by Law.

11.4 Each Party must use all reasonable endeavours to mitigate any Losses which it suffers under or in connection with this Assignment and Licence, including where any such Losses are covered by an indemnity.

11.5 When calculating the Supplier's liability under clause 11.1, Losses covered by Required Insurances will not be taken into consideration.

12 Invalid parts of this Assignment and Licence

12.1 If any part of this Assignment and Licence is prohibited by Law or judged by a court to be unlawful, void or unenforceable, it must be removed from this Assignment and Licence as much as required and rendered ineffective as far as possible without affecting the rest of the Assignment and Licence, or whether it is valid or enforceable.

13 No other terms apply

13.1 Except as otherwise expressly provided in this Assignment and Licence or in the TQ Agreement, the provisions incorporated into this Assignment and Licence are the entire agreement between the Parties. The Assignment and Licence replaces all previous statements and agreements whether written or oral. No other provisions apply.

13.2 Variation of this Assignment and Licence is only effective if agreed in writing and signed by both Parties.

14 Other people's rights in this Assignment and Licence

14.1 No third parties may use the Contracts (Rights of Third Parties) Act ("**CRTPA**") to enforce any term of this Assignment and Licence unless stated (referring to CRTPA) in this Assignment and Licence. This does not affect third party rights and remedies that exist independently from CRTPA.

15 Relationships created by this Assignment and Licence

15.1 This Assignment and Licence does not create a partnership, joint venture or employment relationship. The Supplier must represent themselves accordingly and ensure others do so.

16 Giving up contract rights

16.1 A partial or full waiver or relaxation of the terms of this Assignment and Licence is only valid if it is stated to be a waiver in writing to the other Party.

17 Transferring responsibilities

17.1 The Supplier must not assign this Assignment and Licence without Approval.

17.2 The Authority can assign, novate or transfer this Assignment and Licence or any part of it to any Crown Body, public or private sector body which performs the functions of the Authority.

17.3 The Supplier must enter into a novation agreement in the form that the Authority specifies in order to use its rights under clause 17.2.

17.4 The Supplier can terminate this Assignment and Licence if it is novated under clause 17.2 to a private sector body that is experiencing an Insolvency Event.

18 How to communicate about this Assignment and Licence

18.1 All notices under this Assignment and Licence must be in writing and are considered effective on the Working Day of delivery as long as delivered before 5:00 pm on a Working Day. Otherwise the notice is effective on the next Working Day. An email is effective when sent unless an error message is received.

18.2 Notices to the Authority must be sent to the Authority Authorised Representative's address and email address, and all notices must be copied to the Authority's Head of Commercial Delivery Management [redacted] and the Authority's General Counsel [redacted]

18.3 This clause does not apply to the service of legal proceedings or any documents in any legal action, arbitration or dispute resolution.

19 Dealing with claims

19.1 If a Beneficiary is notified or otherwise becomes aware of a Claim then it must notify the Indemnifier as soon as reasonably practical and no later than 10 Working Days after such notification or date of first awareness.

19.2 At the Indemnifier's cost the Beneficiary must both:

19.2.1 allow the Indemnifier to conduct all negotiations and proceedings to do with a Claim; and

19.2.2 give the Indemnifier reasonable assistance with the Claim if requested.

19.3 The Beneficiary must not make admissions about the Claim without the prior written consent of the Indemnifier which cannot be unreasonably withheld or delayed.

19.4 The Indemnifier must consider and defend the Claim diligently using competent legal advisors and in a way that does not damage the Beneficiary's reputation.

19.5 The Indemnifier must not settle or compromise any Claim without the Beneficiary's prior written consent which it must not unreasonably withhold or delay.

19.6 Each Beneficiary must take all reasonable steps to minimise and mitigate any losses that it suffers because of the Claim.

19.7 If the Indemnifier pays the Beneficiary money under an indemnity and the Beneficiary later recovers money which is directly related to the Claim, the Beneficiary must immediately repay the Indemnifier the lesser of either:

19.7.1 the sum recovered minus any legitimate amount spent by the Beneficiary when recovering this money; or

19.7.2 the amount the Indemnifier paid the Beneficiary for the Claim.

20 Resolving disputes

20.1 If there is a Dispute, the senior representatives of the Parties who have authority to settle the Dispute will, within 28 days of a written request from the other Party, meet in good faith to resolve the Dispute.

20.2 If the Dispute is not resolved at that meeting, the Parties can attempt to settle it by mediation using the Centre for Effective Dispute Resolution ("**CEDR**") Model Mediation Procedure current at the time of the Dispute. If the Parties cannot agree on a mediator, the mediator will be nominated by CEDR. If either Party does not wish to use, or continue to use mediation, or mediation does not resolve the Dispute, the Dispute must be resolved using clauses 20.3 to 20.5.

20.3 Unless the Authority refers the Dispute to arbitration using clause 20.4, the Parties irrevocably agree that the courts of England and Wales have the exclusive jurisdiction to:

20.3.1 determine the Dispute;

20.3.2 grant interim remedies, or any other provisional or protective relief.

20.4 The Supplier agrees that the Authority has the exclusive right to refer any Dispute to be finally resolved by arbitration under the London Court of International Arbitration Rules current at the time of the Dispute. There will be only one arbitrator. The seat or legal place of the arbitration will be London and the proceedings will be in English.

20.5 The Authority has the right to refer a Dispute to arbitration even if the Supplier has started or has attempted to start court proceedings under clause 20.4, unless the Authority has agreed to the court proceedings or participated in them. Even if court proceedings have started, the Parties must do everything necessary to ensure that the court proceedings are stayed in favour of any arbitration proceedings if they are started under clause 20.4.

20.6 The Supplier cannot suspend the performance of this Assignment and Licence during any Dispute.

21 Which law applies

21.1 This Assignment and Licence and any issues arising out of, or connected to it, are governed by English law.

ANNEX

IPR Assurance Certificate

This certificate is given pursuant to clause 13.9 of the agreement ("**Contract**") between the Institute for Apprenticeships and Technical Education ("**Authority**") and the supplier named below ("**Supplier**"), and the Intellectual Property Assignment and Licence between the Authority and the Supplier (which also forms Schedule 14 of the Contract) ("**Assignment and Licence**").[1]

Guidance:

When to complete this certificate: This certificate should be completed in respect of each Deliverable (as defined in the Contract) which is made available to the Authority under the Contract, and a completed certificate should be supplied to the Authority with that Deliverable. This includes updates to existing Deliverables.

Purpose of this certificate: This certificate is intended to confirm that the specific Deliverable fully complies with the intellectual property provisions of the Contract. A copy of the certificate will be retained by the Authority as evidence of the intellectual property position.

Supplier Declaration:

We (being the Supplier named below) confirm that the Deliverable(s) supplied together with (or shortly before or after) this certificate, all elements of which are listed in either Table 1 or Table 2 below[2], comply with the intellectual property provisions in the Contract, in particular the applicable warranties set out in clause 5 of the Assignment and Licence.

We confirm that the Deliverable(s) either:
(i) contain no third party intellectual property rights, or
(ii) contain third party intellectual property rights and we have obtained the consent of the applicable third party:

- in the case of Key Materials, to their assignment and transfer to the Authority; and/or
- in the case of Ancillary Materials, to their licence to the Authority,

in each case on the terms and conditions of the Contract and Assignment and Licence.

We confirm that this certificate overrides any statement or copyright notice forming part of the Deliverable(s) which is in any way inconsistent with this certificate. We agree that this certificate does not detract in any way from the rights granted to the Authority in the Contract.

Key Materials

We confirm that the Deliverable(s) set out in Table 1 below, or the elements of the Deliverable(s) set out in Table 1 below, are Key Materials, as defined in the Contract:

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[1] The parties have agreed to replace the certificate in the form set out in the Annex to Schedule 14 of the Contract with this completed version, which lists Deliverables that are being made available to the Authority. For the avoidance of doubt, an additional completed version of this certificate may be produced for a Deliverable in the event that the Deliverable is updated and made available to the Authority. No Deliverable(s) listed on this and any other certificate shall be removed or replaced unless otherwise specified by the Authority.

[2] If, by exception, the Supplier asserts that the Deliverable includes elements which are neither Key Materials nor Ancillary Materials, this should be notified in writing to the Authority prior to the relevant Deliverable being made available to the Authority.

Table 1

TQ Deliverable	Component	Filename/Title	Version	Date submitted	Key Material Applicable Rights
Set out the Product / Deliverable name (e.g. “TQ Specification”, “Specimen Assessment Materials”, “Guide Standard Exemplification Materials”	E.g. “Core”, Occupational Specialism “title/name”,	Filename as saved / visible to end users who will download the file	Version number as submitted and recorded on the Deliverable	Date the final version was submitted to the Authority	Set out elements which are Key Materials, or confirm “entire Deliverable”

All intellectual property rights in the Deliverable(s), or elements of the Deliverable(s) listed above in Table 1 as Key Materials, have vested or hereby vest in the Authority pursuant to the Assignment and Licence.

Ancillary Materials

We confirm that the Deliverable(s) set out in Table 2 below, or the elements of the Deliverable set out in Table 2 below are Ancillary Materials, as defined in the Contract:

Table 2

TQ Deliverable	Component	Filename/Title	Version	Date submitted	Ancillary Material Applicable Rights
Set out the Product / Deliverable name (e.g. “Assessment Strategy”	Record “N/A” if not applicable	Filename as saved / visible to end users who will download the file	Version number as submitted and recorded on the Deliverable	Date the final version was submitted to the Authority	Set out elements which are Ancillary Materials, or confirm “entire Deliverable”

All intellectual property rights in the Deliverable(s), or elements of the Deliverable(s) listed above in Table 2 as Ancillary Materials, are licensed to the Authority on the terms and conditions of and pursuant to the Assignment and Licence.

Signed for and on behalf of the Supplier:

Signed by

PEARSON EDUCATION LIMITED

Signed by

THE INSTITUTE FOR APPRENTICESHIPS AND TECHNICAL EDUCATION