

Blended learning approach to delivering BTEC International qualifications

September 2021 to August 2022

Applied Science

Guidance for BTEC International Level 2 and 3 qualifications

Teaching, learning and assessment

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Introduction

As COVID-19 may continue to impact upon teaching, learning and assessment through the academic year, affecting those learners who are part-way through their qualifications and those who are commencing this academic year, we have produced this guidance to support the effective delivery of BTEC course content. We are committed to ensuring that learners continue to benefit from the breadth of content of BTEC qualifications through adaptations in teaching and learning.

This document is intended to provide you with guidance for how you might adapt delivery for the sector's BTEC qualifications in the academic year of 2021-2022.

We will continue to work with our regulators and relevant sector bodies on any possible adaptations or accommodations in line with the relevant policy and regulatory considerations. Key aspects such as social distancing, safety, lost teaching time, subject content and practical activities have been considered from a sector

perspective for your reference. However, it should be noted that all of the guidance provided here must be considered within the context of any relevant guidance issued by your own centre, relevant governing and industry bodies, local and national government.

For further advice and guidance, please refer to the Teaching, Learning and Assessment pages on [Pearson's website](#) or contact us via the [Customer Support portal](#).

We look forward to continuing to support you and your learners throughout this challenging time and wish you well for the coming year.

Resources

To help you with the delivery of a blended-learning programme, several resources are available. You can purchase digital *Study Texts* and *Teacher Resource Packs* from our website [here](#) to support you with the delivery of our Level 3 International qualifications (2021).

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Additionally, there are free resources available [here](#), that support the delivery of Level 3 (2010) QCF qualifications in some sectors. Note that to enter this page you will first need to accept the Terms and Conditions.

Units with resources available will be marked according to the following key:

* Study Text

† Teacher Resource Pack

‡ QCF Guides

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Overview: Applied Science

Adaptations to Assessments in 2021/2022

Please refer to the assessment section on the [International BTEC Adaptations page](#) for adaptations to assessments and qualifications for the 2021-2022 Academic Year.

Please note that not all qualifications can or will be adapted, and it is important that you refer to the relevant adaptation guidance for 2021-2022.

Some qualifications will not be adapted for one of the following reasons:

- An adaptation would impact the reliability and validity of the qualification
- The qualification is a licence to practice or primary purpose is progression to the workplace.

Learner eligibility

There are currently no plans to have these adaptations extend to learners who take assessments in 2022/23, regardless of when they are due to certificate.

Adaptations are only available in this academic year, for assessment due to take place between 1 September 2021-31 August 2022.

Social Distance

The delivery and assessment of these programmes does occasionally require group work or close proximity between learners, especially when learners work in pairs/small groups. A small number of assessments do require close proximity (e.g. measuring cardiorespiratory parameters, some elements of performance). Centres will need to have measures in place to enable these to be carried out safely. Where this is not possible, the use of simulations would be acceptable during the present COVID-19 situation. However, where assessment criteria require learners to undertake practical work (e.g. use of assessment command verb 'demonstrate' or 'carry out') a simulation is not acceptable.

Theory can be delivered by distance/blended learning methods and in some contexts (e.g. the Open University) this is the normal way of working.

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Safety

Care is needed if an attempt is made to carry out practical work at home. This will not usually be possible. For example, laboratory work will probably require fewer learners in the lab, which may make the situation safer. However, lone working should not be attempted.

Lost time teaching

Centres must focus on ensuring that learners have an adequate foundation for the units that will be delivered in 2021-22. Learners will probably have missed some teaching during early to mid 2021 and tutors will need to in-fill as they deliver the programmes during 2021-22. This will require careful planning, particularly on programmes in which the learners were in other settings during 2020-21 and are likely to have had varied experiences (e.g. those who start BTEC level 3 in Year 11 in September 2021).

Flexibility of delivery and assessment

There is considerable latitude for the use of diverse delivery models and assessment models. Most assessments can employ written reports, presentations, posters, video or audio recordings and other methods and these can be used in remote delivery. Visits to industries

are valuable but not mandatory and work experience is not required in these programmes.

What is important to retain the validity of the sector's qualifications?

As contact time between staff and learners may be limited, centres should prioritise contact time for practical work, as theory can be delivered remotely. Centres may decide to deliver optional units which do not require practical work in assessment.

Are there other methodologies that can be used to support the purpose of the qualification?

As long as practical work is employed where required, a wide range of assessment methods can be used in these programmes. However, time-constrained assessments are likely to be a poor substitute for other methods as they present inappropriate barriers to the demonstration of required learning outcomes.

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Teaching, Learning and Assessment: Applied Science

Unit Title	Remote delivery (✓ / X / partially)	Socially distanced (✓ / X)	Delivery Guidance
BTEC International Level 3 (2021) – Applied Science			
†Unit 1: Principles and Applications of Biology I	partially	✓	This unit is largely theoretical and could be taught remotely with videos and simulations used to provide illustration and examples. Learning aim A requires learners to use a microscope in their studies but this could be combined with other units (Units 14 and 19).
†Unit 2: Principles and Applications of Chemistry I	partially	✓	Learning aims A and B deal with subject matter that is theoretical, but Learning aims C and D require practical work to investigate elements and use quantitative techniques, which would require a laboratory. For Learning aim D, learners will need the opportunity to practice techniques before using them in assessment.
†Unit 3: Principles and Applications of Physics I	partially	✓	The unit is largely theoretical, although waves, forces and motion are best demonstrated through practical work. Learning aim A requires practical work for criteria A.P2 and A.M2 which would require laboratory work. Learning aims B is theoretical subject matter and could be taught remotely using simulations.

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†Unit 4: Investigative Project Skills	partially	✓	Much of this unit is theoretical e.g. literature review, hypothesis and planning, health and safety, analysing and presenting results) which could be delivered remotely. However, Learning Aim C requires practical work.
†Unit 5: Principles and Applications of Biology II	✓	✓	This unit is theoretical in content and can be delivered remotely using structured presentations, case studies and discussions.
†Unit 6: Principles and Applications of Chemistry II	✗	✓	Much of this unit requires practical work to support theory, and assessment (Learning aims A, B and D) and will require access to laboratory working for chemicals (e.g. inorganic salts, organic compounds) and equipment (e.g. glassware, Quickfit apparatus). For Learning aim D, learners will need the opportunity to practice techniques before using them in assessment. Learning aim C is entirely theoretical and can be delivered remotely using structured presentations and other e-learning platforms.
Unit 7: Principles and Applications of Physics II	✓	✓	The unit is largely theoretical (thermal physics, materials, fluid motion and radioactivity). Practical work is encouraged in the delivery and assessment of this unit, but it is not a mandatory requirement, and video or other simulations could be used to understand and demonstrate concepts.
Unit 8: Contemporary Issues in Science	✓	✓	This unit is theoretical content and can be delivered remotely by structured presentation, case studies, or independent learner research. In addition to written work, centres should ensure that learners have online class forums to discuss and present arguments surrounding contemporary issues.

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Unit 9: Biomedical Science	partially	✓	This unit is largely theoretical but two criteria (A.P3 and C.P8) require practical laboratory work.
Unit 10: Climate Change	✓	✓	This unit is theoretical in content and can be delivered remotely by structured presentation, case studies, or independent learner research. Video or other simulations could be used to understand and demonstrate concepts.
Unit 11: Functional Physiology of Human Body Systems	partially	✓	This unit is largely theoretical but one criterion (A.P2) requires practical laboratory work. Practicals are useful in delivery but could be substituted by videos or simulations.
Unit 12: Human Regulation and Reproduction	✓	✓	This unit is theoretical in content and can be delivered remotely by structured presentation, case studies, or independent learner research. Assessment does not require a practical work. Practicals are useful in delivery but could be substituted by videos or simulations.

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Unit 13: Biological Molecules and Metabolic Pathways	partially	✓	<p>The unit has practical work in the assessment although Learning aim A is theoretical.</p> <p>Learning aim B requires an investigation of factors affecting respiration in humans. This can be achieved by rate of oxygen consumption but cannot be carried out at home. It could be possible to use ventilation rate as proxy for oxygen consumption and this could be done at remotely.</p> <p>Learning aim C requires the investigation of factors affecting photosynthesis, which requires practical work and laboratory equipment.</p>
Unit 14: Genetics and Genetic Engineering	✗	✓	<p>This unit requires practical work although Learning aim A is theoretical.</p> <p>Learning aim B involves microscopy and Learning aim C investigates monohybrid and dihybrid crosses laboratory work.</p> <p>Learning aim D requires three practicals (DNA extraction, PCR and gel electrophoresis) and will require laboratory work.</p>
Unit 15: Diseases and Infections	✓	✓	<p>Although largely a theoretical unit in content, practical work is very useful in the delivery and assessment, however it is not a requirement. Videos and simulations could be used.</p>

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Unit 16: Applications of Inorganic Chemistry	x	✓	This unit is underpinned by theoretical principles and practical work. Each learning aim requires practical work and access to laboratory working for chemicals (e.g. transition metal compounds, acids and bases) and equipment (e.g. titrimetric equipment, pH meters, colorimeters, powerpacks). For Learning aims C and D, learners will need the opportunity to practice techniques before using them in assessment.
Unit 17: Electrical Circuits and their Applications	partially	✓	It may be possible to use videos and simulations in teaching, but learners will need practice in building circuits and measuring values before these are assessed for B.P2 and Learning aim D.
Unit 18: Astronomy and Space Science	✓	✓	A largely theoretical unit, but use of videos and simulations is very valuable. The assessment guidance specifies the use of practicals in Learning Aim B (optics) and this learning aim does require observations and measurements from the night sky. This would not normally be done at a school/college. The other practicals specified in the Guidance (light boxes, mirrors, lenses) are not required by the criteria and at this time could be replaced by simulations.
Unit 19: Microbiology and Microbiological Techniques	x	✓	This unit requires a large amount of practical work in the assessment. Learners should be able to practice techniques before being assessed in them.

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Unit 20: Applications of Physical Chemistry	x	✓	Much of this unit requires practical work to support theory and assessment (Learning aims A, B and C) and will require access to laboratory working for chemicals and equipment (e.g. glassware, thermometers, titrimetric equipment, colorimeters). For Learning aims B and C, learners will need the opportunity to practice techniques before using them in assessment. Learning aim D is entirely theoretical and can be delivered remotely using structured presentations and other e-learning platforms.
Unit 21: Applications of Organic Chemistry	partially	✓	Although practical work is very useful in the delivery of this unit, it is not an essential requirement, and Learning aims A, B and D can be delivered remotely using structured presentations, case studies, or independent learner research. Video or other simulations could also be used to understand and demonstrate concepts (e.g. mechanisms). Practical work is essential for Learning aim C criteria and learners will require access to laboratory working for chemicals (e.g. organic compounds and other reagents) and equipment (e.g. Quickfit apparatus, fume cupboard). Learners will need the opportunity to practice techniques before using them in assessment.
Unit 22: Medical Physics Applications	✓	✓	This is a theoretical unit and practical work is not required. Delivery can be done remotely and could be improved by using videos and simulations as learners often have difficulty with the concepts explored.

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Unit 23: Materials Science	partially	✓	The unit is largely theoretical so structured presentations, case studies, and independent learner research are appropriate for remote delivery. However, some hands-on practical experience of materials referenced in the unit is expected to take place in context. Some of the properties of various materials could be shown using video clips and simulation. Learning aim A / criterion A.P1 requires that some physical testing of materials is carried out by learners, which would need to be done in a laboratory (e.g. melting point determination, electrical conductivity).
Unit 24: Pollution and Waste Management	✓	✓	This unit consists of theoretical content and can be delivered remotely by structured presentation, video, case studies, or independent learner research. Assessment does not require practical work.
Unit 25: Water Quality	✓	✓	This unit is largely theoretical so can be delivered mostly remotely by structured presentation, video, case studies, or independent learner research. However, one criterion (C.P6) requires a practical investigation and other criteria under Learning aim C rely upon this. However, the investigation (water quality of an aquatic environment) would not necessarily be done in a school/college.
Unit 26: Animal Conservation	✓	✓	The unit is largely theoretical so can be delivered remotely and structured presentations, case studies, video, or independent learner research are appropriate. However, some access to animal conservation environments is expected to take place to support delivery of this unit and supply context.

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Unit 27: Ecosystems	✓	✓	This unit is largely theoretical so can be delivered mostly remotely by structured presentation, video, case studies, or independent learner research. However, Learning aim C requires learners to carry out surveys of species. However, the investigation would not typically be carried out in a school/college.
Unit 28: Sustainable Energy	✓	✓	This unit consists of theoretical content and can be delivered remotely by structured presentation, video, case studies, or independent learner research. Assessment does not require practical work.

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Unit Title	Remote delivery (✓ / X / partially)	Socially distanced (✓ / X)	Delivery Guidance
BTEC International Level 3 (2010) – Applied Science			
Unit 1: Fundamentals of Science	✘	✓	This unit requires practicals including making-up standard solutions, titration, light microscopy, calorific value of fuels and energy interconversions. These must all be carried out in centre laboratories.
Unit 2: Working in the Science Industry	✓	✓	This unit could be delivered without any additional practical work. Criterion P5 does require laboratory work in order to demonstrate safe working but this can be obtained from practical work carried out for other units, including work carried out before the lockdown.
Unit 3: Scientific Investigation	partially	✓	This unit requires the use of practical work in delivery and assessment. The learners are required to demonstrate the ability to carry out practical work and attaining the required standard is likely to require some practice. It is essential for this unit that the learners plan, and carry out, their own practical investigation.
Unit 4: Scientific Practical Techniques	✘	✓	Laboratory practical work is a fundamental feature of this unit including various quantitative, qualitative and separative techniques. Quantitative could be limited to titration.

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Unit 5: Perceptions of Science	✓	✓	This unit is theoretical in content and can be delivered remotely by structured presentation, case studies, or independent learner research. Learners should have a good understanding of scientific theories and reporting from other units (e.g. Units 1 and 10).
Unit 6: Using Mathematical Tools for Science	✗	✓	This unit requires the learners to collect and record scientific data. However, this should be based on practical work for one of the other units.
Unit 7: Mathematical Calculations of Science	✓	✓	This unit is theoretical and can be delivered by distance learning. Care is needed to use suitable contexts and to emphasise the relevance of the mathematical techniques to science.
Unit 8: Using Statistics for Science	✓	✓	This unit is theoretical and can be delivered by distance learning. It should use data collected by the learners from their own investigations and, as there will be practical work in other units, this should be the approach used. Alternatively, data collected by the learners before lockdown, or given data, could be used in the assessment.
Unit 9: Informatics for Science	✓	✓	This unit is theoretical and can be delivered by distance learning. Learners need to collect data for their database, but from scientific data sites rather than their own investigations.

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Unit 10: Using Science in the Workplace	partially	✓	Although access to a scientific work-place is very useful in the delivery and assessment of this unit, it is not a requirement and could be substituted with a detailed case study, or learner research (with appropriate guidance). Criterion P5 does require laboratory work in order to represent an industrial process at the organisation. Potentially, if the organisation and its product are chosen carefully, the investigation could be combined with relevant practical work in other units (e.g. Units 1, 3 or 4).
Unit 11: Physiology of Human Body Systems	partially	✓	This subject could be taught remotely with videos and simulations used to provide illustrations and examples. However, practical work is needed for P3, P4 and P5.
Unit 12: Physiology of Human Regulation and Reproduction	✓	✓	This unit does not require practical work in either the delivery or assessment. However, practical demonstrations are valuable in delivery (e.g. of homeostasis) but video or simulations could substitute at the present time.
Unit 13: Biochemistry and Biochemical Techniques	partially	✓	Most of this unit is theoretical, but there are two important practical components. These are the use of separative techniques (for P2) and the investigation of factors affecting enzyme action (for P5).

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Unit 14: Energy Changes Sources and Applications	partially	✓	This unit has a limited requirement for practical work although it is certainly valuable in delivery to enable learners to understand the concepts. Only P2 requires practical in assessment.
Unit 15: Microbiological Techniques	x	✓	Practical work is needed in this unit. The assessment of criteria P1, P3 and P4 specify the use of practical. P3 and P4 can be assessed in one practical assignment.
Unit 16: Chemistry for Biology Technicians	x	✓	This unit requires practical work in the assessment and should have practical work in the teaching (delivery). If necessary, videos or simulations could be used in the teaching. Each learner must carry out the required practical work for P1, P2, P3 and P5.
Unit 17: Electrical Circuits and their Applications	partially	✓	Learners must assemble electrical circuits and take measurements from those circuits. Otherwise the unit can be delivered and assessed remotely. Each learner must use parallel and series circuits, and must use circuits containing parallel and series elements.
Unit 18: Genetics and Genetic Engineering	partially	✓	Much of this unit can be delivered remotely, making use of videos or simulations. However practical work is required in the assessment (P3, P6).

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Unit 19: Practical Chemical Analysis	x	✓	Although the unit suggests extensive practical work, much of this unit is underpinned by theoretical principles and analysis, which can be done remotely. In some instances, learners can be supplied with data to analyse in place of practical work to generate data (i.e. spectroscopy in P2 and instrumental chromatography in P5). Criteria P1, P3 and P4 require titration, colorimetry and chromatography practical work, but could be linked with work in Units 1 and 4.
Unit 20: Medical Physics Techniques	✓	✓	This is a theoretical unit and practical work is not required. Delivery can be done remotely and could be improved by using videos and simulations as learners often have difficulty with the concepts explored.
Unit 21: Biomedical Science Techniques	partially	✓	The guidance for the unit advises that learners should see an industrial laboratory for context, but mostly the content is theoretical. Practical work that is relevant to the unit should be carried out, and criterion P2 does require preparative work.
Unit 22: Chemical Laboratory Techniques	x	✓	This unit requires practical work for every pass criterion. Some practical work could be holistic, covering several criteria (i.e. preparation of a substance should also allow for % yield and % purity by quantitative analysis to cover P1, P2 and P5). Practical work could also be linked particularly with work in Unit 4, but also Units 1 and 19.

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Unit 23: Science for Environmental Technicians	partially	✓	Most of this unit is theoretical but there are practical investigations in P3 (identification of soil types and composition) and P4 (identification of rock types).
Unit 24: Principles of Plant and Soil Science	partially	✓	Practical work would support the delivery of this unit, but it is mostly theoretical and so can be delivered remotely using structured presentations, videos and independent learner research. Only P4 specifically requires practical work in order to investigate characteristics of soil. This could be linked with practical work required for Unit 23.
Unit 25: Electronics for Science Technicians	✗	✓	This unit requires practical work in the assessment and should have practical work in the teaching (delivery). Learners must assemble, test and rectify faults in electrical circuits across the majority of criteria.
Unit 26: Industrial Chemical Reactions	partially	✓	The guidance for the unit recommends as much practical work as possible so that concepts are in context and will be understood fully by learners. If necessary, videos or simulations could be used in the teaching, but could also be linked with Unit 16. Only criteria P1 (enthalpy change) and P2 (rate) specifically require practical work to be assessed.
Unit 27: Chemical Periodicity and Its Applications	partially	✓	The guidance for the unit recommends the use of practical work to illustrate and understand concepts. If necessary, videos or simulations could be used in the teaching. Many criteria can be supported with the provision of data or with independent research by learners. Two criteria specifically require

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			practical work. The guidance for criterion P6 indicates that analytical redox titrations must be performed by learners as part of their work. Criterion P7 indicates that learners carry out practical investigations of aqueous transition metal ions in solution (which are indicated in the Unit content).
Unit 28: Industrial Applications of Organic Chemistry	x	✓	The guidance for the unit recommends as much practical work as possible so that concepts are in context and will be understood fully by learners. For assessment, only criterion P6 requires practical work which is drawn from the learner's practical work across the delivery of this unit. Learners will therefore require access to laboratory working for chemicals and equipment.
Unit 32: Forensic Evidence Collection and Analysis	partially	✓	Much of the unit content can be delivered remotely using video material to introduce some of the practical techniques. Practical work is essential for the assessment P1, P3, P5 and P7. The simulated crime scene could be designed to be left in place for several days to allow individual learners, or small groups of 1 or 2 learners, to maintain social-distancing whilst examining the scene and taking measurements, collecting samples, etc. If a "body" is to be used in the crime scene, then this should be a manikin as opposed to a live person. Care should be taken to devise a scene not using unstable or perishable materials if the scene is to be used over a prolonged period. Some materials may need to be decontaminated or replaced between examinations. For the analysis of evidence, small groups of learners could be timetabled in the laboratory to carry out their practical work, thus maintaining social-distancing.

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Unit 33: Forensic Photography	partially	✓	<p>Much of the unit content can be delivered remotely. Practical work is essential for the portfolio that must be created for P5. The simulated crime scene used for Unit 32 could also be used for this unit. The scene could be designed to be left in place for several days to allow individual learners, or small groups of 1 or 2 learners, to maintain social-distancing whilst examining the scene and taking the necessary photographs. If a “body” is to be used in the crime scene, then this should be a manikin as opposed to a live person. Care should be taken to devise a scene using unstable or perishable materials if the scene is to be used over a prolonged period. Some materials may need to be decontaminated or replaced between examinations. The additional time taken to carry out practical work this way could come from the time savings from remote delivery of many of the theoretical aspects of this unit.</p>
Unit 36: Forensic Fire Investigation	partially	✓	<p>Much of the unit content can be delivered remotely. Practical work is essential for M1 (investigate combustion and extinction) and P3 (investigate a simulated fire scene). Small groups of learners could be timetabled in the laboratory to carry out their practical investigations, thus maintaining social-distancing. Some equipment or materials may need to be decontaminated or replaced between sessions. The additional time taken to carry out practical work this way could come from the time savings from remote delivery of many of the theoretical aspects of this unit.</p>

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Unit 38: Traffic Accident Investigation	partially	✓	<p>Much of the unit content can be delivered remotely. Video material, either already available on the internet, or centre-produced practical demonstrations, can be used to introduce some of the practical techniques that learners may be new to. Practical work is essential for P3 in order to carry out an investigation of a simulated crash scene. Small groups of learners could be timetabled in the laboratory to carry out their practical analyses, while maintaining social-distancing. Some equipment or materials may need to be decontaminated or replaced between practical sessions. The simulated collision scene could be designed to be left in place for several days to allow individual learners, or small groups of 1 or 2 learners, to maintain social-distancing while examining the scene and taking measurements, producing diagrams, etc. Alternatively, video material and case study data could be used (as outlined in the unit specification). The additional time taken to carry out practical work this way could come from the time savings from remote delivery of many of the theoretical aspects of this unit.</p>
Unit 40: Criminal Investigations in Practice	✓	✓	<p>Much of this unit can be delivered remotely. For Learning Outcome 1, a case study can be used in place of a simulated crime scene (as outlined in the unit specification). For Learning Outcome 3, where learners must participate in mock interviews, these can be carried out remotely using video conferencing or in a classroom with social-distancing.</p>

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Unit 43: Diseases and Infections	✓	✓	Opportunities for practical work are limited, which makes this unit mainly theoretical and research based. Case studies are very useful in the delivery and assessment of this unit which can be done remotely.
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Unit Title	Remote delivery (✓ / X / partially)	Socially distanced (✓ / X)	Delivery Guidance
BTEC International Level 2 (2021) – Applied Science			
Unit 1: Principles of Science	✓	✓	Use of practical in delivery is advised to illustrate concepts (i.e. use of microscopy, chemical reactions and energy transfers), but could be replaced by videos or simulations. However, some practical work will need to be undertaken in preparation for practical work that is present in the Pearson Set Assignment.
Unit 2: Chemistry and our Earth	✓	✓	In normal circumstances practical work should be used in delivery and assessment to illustrate concepts and develop bench skills. However, where this is impossible, in the short-term, videos and simulations could be used.
Unit 3: Energy and our Universe	partially	✓	A largely theoretical unit although Learning aim B (electricity) requires the learners to build simple electrical circuits and measure current and potential difference.
Unit 4: Biology and our Environment	✓	✓	This unit is often delivered with practical work, which is best practice. For example, the dichotomous keys should ideally be developed to identify organisms that they have collected (e.g. grasses, leaves, insects). However, practical work is not required in the delivery or assessment of this unit.

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Unit 5: Applications of Chemical Substances	x	✓	<p>This unit does require practical work.</p> <p>In Learning aim A, the learners must measure temperature changes associated with exothermic and endothermic reactions. In Learning aim B, they must identify various organic compounds.</p> <p>Learning aims A and B require learners to carry out the investigations, and tutor demonstration would not meet these criteria.</p>
Unit 6: Applications of Physical Science	x	✓	<p>All learning aims require practical work.</p> <p>Learning aims A (motion) and B (forces) could be achieved at home or in a classroom whereas Learning aims C (optics) and D (electricity) require practical work in the laboratory.</p>
Unit 7: Health Applications of Life Science	✓	✓	<p>This unit is theoretical and practical work is not needed in delivery or assessment.</p>
Unit 8: Scientific Skills	partially	✓	<p>Much of this unit is theoretical e.g. literature review, hypothesis and planning, health and safety, analysing and presenting results), which could be delivered remotely. However Learning Aim B requires practical assessment and learners should have a good understanding of practical work from other units (particularly units 1, 2, 3 and 4).</p> <p>Delivery is likely to be more effective if it takes place in the laboratory with planning, carrying out and evaluation of practical investigations. Without this support, the assessment may be too abstract for learners.</p>

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Unit 9: Practical Scientific Project	partially	✓	Much of this unit is theoretical e.g. literature review, hypothesis and planning, health and safety, analysing and presenting results), which could be delivered remotely. However, Learning Aim B requires practical work as part of the investigation.
Unit 10: World Energy	✓	✓	This unit is theoretical in content and can be delivered remotely by structured presentation, case studies, or independent learner research. Videos or other simulations could be used to demonstrate concepts.
Unit 11: How Scientific Theories are Formulated	✓	✓	This unit is theoretical in content, and can be delivered remotely by structured presentation, case studies, or independent learner research. Learners should have a good understanding of scientific theories from other units (particularly units 1, 2, 3, 4, 5, 6 and 7).
Unit 12: The Living Body	✓	✓	This unit is theoretical in content, and can be delivered remotely using structured presentations, videos and simulations, to provide illustration and examples.
Unit 13: Monitoring the Environment	✓	✓	Much of this unit is theoretical and can be delivered remotely by structured presentation, video, case studies, or independent learner research. However, criterion B.P2 requires learners to carry out monitoring techniques to investigate an ecosystem. The investigation would not be carried out in a school/college but learners will need to be observed as part of their evidence.

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Unit 14: Growing Plants for Food	✓	✓	Much of this unit is theoretical and can be delivered remotely by structured presentation, video, case studies, or independent learner research. However, criterion A.P1 and associated Learning aim A criteria require a practical investigation into plant growth. The investigation would not necessarily need to be carried out in a school/college, and could be conducted remotely by the learner on a small scale with a plant and environment of their choice over a period of time.
Unit 15: Investigating a Crime Scene	partially	✓	Much of the unit content can be delivered remotely using video material to introduce some of the practical techniques. Practical work is essential for Learning aims B and C. The simulated crime scene could be designed to be left in place for several days to allow individual learners, or small groups of 1 or 2 learners, to maintain social-distancing whilst examining the scene and taking measurements, collecting samples, etc. If a “body” is to be used in the crime scene, then this should be a manikin as opposed to a live person. Care should be taken to devise a scene not using unstable or perishable materials if the scene is to be used over a prolonged period. Some materials may need to be decontaminated or replaced between examinations. For C.P6, small groups of learners could be timetabled in the laboratory to carry out their practical analyses, thus maintaining social-distancing.
Unit 16: Science in Medicine	✓	✓	This is a theoretical unit and practical work is not required. It can be delivered remotely by structured presentation, case studies, or independent learner research. The delivery could be improved by using videos and simulations as learners often have difficulty with the concepts explored.

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Unit 17: Understanding Human Behaviour	✓	✓	This is a theoretical unit and practical work is not required. It can be delivered remotely by structured presentation, video, case studies, or independent learner research.
Unit 18: Designing and Making Useful Devices in Science	partially	✓	This unit has a high theoretical and practical content. Theory can be delivered remotely by structured presentation, video or independent learner research. All learning aims of this unit require practical work as learners will need to make and use their devices. Depending upon their designs and the materials required, it is possible for learners to build (and possibly test) their devices remotely (e.g. for Learning aims A and B, a basic, home-made hydrometer from a straw or polarimeter from polaroid sunglass lenses could be built and tested in different concentrations of sugar solution). However, learners may also require access to specialised equipment to verify findings if it is part of their planning (e.g. a polarimeter for Learning aim B, a voltmeter for Learning aim C, a commercial balance for Learning aim D), which would only be available to them in a laboratory.
Unit 19: Chemical Analysis and Detection	✗	✓	This unit is underpinned by theoretical principles and practical work. Each learning aim of this unit requires practical work and will require access to laboratory working for chemicals (e.g. acids and bases, bench reagents, solvents) and equipment (e.g. titrimetric equipment, pH meters, thin layer chromatograms). Learners will need the opportunity to practice techniques before using them in assessment.

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Unit 20: Exploring our Universe	✓	✓	This is a theoretical unit and practical work is not required. It can be delivered remotely by structured presentation, case studies, or independent learner research. The use of videos or simulations is particularly valuable.
Unit 21: Electronics in Action	partially	✓	It may be possible to use video/simulation in teaching but learners will need practice in building circuits and measuring values before these are assessed for Learning aims B and C. Learners will require access to specialist electronic equipment and will need to carry this out in a laboratory. Additionally, guidance for both learning aims indicates that learners must be observed carrying out the experiments.
Unit 22: Biotechnology Procedures and Applications	✓	✓	This is a theoretical unit and practical work is not required. Delivery can be done remotely using structured presentation, case studies, or independent learner research. Certain aspects such as genetic modification could be improved by using videos and simulations as learners often have difficulty with the concepts explored.
Unit 23: Further Chemistry	partially	✓	The unit is theoretical so structured presentations, case studies and independent learner research are appropriate for remote delivery. However, some hands-on practical experience of the concepts referenced in the unit is expected to place in context (i.e. electrolysis of compounds, collecting volumes of gases, preparation and reactions of alcohols). Some of these concepts could be shown using video clips and simulation, but where possible centres should look to prioritise laboratory work within contact time.

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Unit 24: Further Physics	✓	✓	The unit is largely theoretical (X-rays, radioactivity, particle motion and kinetic theory). Practical work is encouraged, where possible, in the delivery and assessment of this unit, but it is not a mandatory requirement, and videos or other simulations could be used to understand and demonstrate concepts.
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