BTEC International Level 3 Extended Diploma (1080 GLH) in Applied Science: Sample Delivery Plan

Audience

This document is aimed at supporting tutors and those delivering BTEC International Level 3 qualifications from April 2020.

Introduction

Clear unit planning and understanding of key deadlines are essential for a successful delivery programme. We have produced a Sample Delivery Plan showing how the BTEC Extended Diploma in Applied Science could be delivered over two years, highlighting assessment milestones and indicating where you can teach units holistically.

Key sections

The document focuses on key dates to plan around and an example of how the Extended Diploma can be structured, set out in the three sections below:

Section 1: Guide to key dates
Setting out the key activities and requirements for course delivery, alongside dates and links to further information.

Section 2: Sample two-year plan – delivery chart
A chart setting out the key deliverables against chosen units.

Section 3: Sample two-year plan – detailed rationale
An in-depth rationale and explanation as to how the suggested plan was structured.

Further support can be found within the relevant specification on Pearson's website (https://qualifications.pearson.com/en/qualifications/btec-international-level-3/applied-science.html).

Below is an overview of how wider support also links to this document.

Support	Purpose
Delivery Guides	A companion to your BTEC International Level 3 specification, Authorised Assignment Briefs (AABs) and Sample Pearson Set Assignments. They contain ideas for teaching and learning, including practical activities, realistic scenarios, ways of involving employers in delivery, ways of managing independent learning and how to approach assessments. The aim of these guides is to show how the specification content might work in practice, and to inspire you to start thinking about different ways to deliver your course.
Authorised Assignment Briefs	Give scenarios and teaching plans for each unit, to be used either as they are set out, or to inform your own planning.
Schemes of Work	Demonstrate how the unit content can be covered in the GLH, while giving lesson ideas and highlighting links to other units to help you plan your teaching.

Section 1: Guide to key dates

Setting out the key activities order and requirements for course delivery alongside links to further information.

Action	Description	Resource/reference
Assessment plan(s)	An assessment plan(s) must be in place to demonstrate that sufficient time is available to deliver and assess all the required units in a timely manner. More than one plan may be required if there are different groups working at different speeds.	Assessment plans are available on the Pearson website. Please note that all units are internally assessed. For a small proportion of units, Pearson sets the assignment and these are also internally assessed. Pearson Set Assignments will be available from October of the year of assessment and can be taken at any point in that year.
Assignment briefs	Assignment briefs should be internally verified to ensure they are fit for purpose and the equipment, resources and staff expertise will be available. This is not required for Pearson Set Assignment units.	Authorised assignment briefs are available here.
Learner induction	A short period of induction is strongly recommended to ensure learners are familiar with the programme and its requirements. Plagiarism, referencing, time management skills, the importance of meeting deadlines and centre policies should be covered.	
Register your learners	Learner registrations need to be made by the deadlines on our website. This will trigger the allocation of a Standards Verifier and support for your centre.	Edexcel Online
Allocation of Standards Verifier	The Standards Verifier needs to see the assessment plan(s) and will agree a sampling schedule with the centre. They are available to give support and guidance.	The details of the Standards Verifier will be emailed to the Quality Nominee at the centre. Please ensure the Quality Nominee details registered with Pearson are accurate.
Internally assessed unit completed	The internally assessed unit(s) needs to have been sampled and reported prior to the end of teaching for the year.	A guide to internal assessments is available here.
Second sampling completed	Second sampling of internally assessed units that were not released for certification must be complete by the end of the teaching for the year.	

Section 2: Sample two-year plan – delivery chart

This plan is intended to be used as guidance.

Key
LA = learning aim
INT = internal assessment
RS = revision session
PSA = Pearson Set Assignment

				YEAR 1 TERM 1												
Unit	**Unit title**	**Guided learning hours**	**Assessment method**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
1	**Principles and Applications of Biology I**	**60**	**Pearson Set Assignment**	**LA A**	**LA A**	**LA B**	**LA B**	**LA C**	**LA C**	**LA C**	**RS/PSA**	**PSA**	**PSA**			
		6 hours per week 1–10, including 15 hours required for assessment														
2	**Principles and Applications of Chemistry I**	**60**	**Pearson Set Assignment**	**LA A**	**LA A**	**LA B**	**LA B**	**LA C**	**LA C**	**LA D**	**LA D**	**LA D**	**RS/PSA**	**PSA**	**PSA**	**PSA**
		4 hours per week 1–15, including 22 hours required for assessment														
3	**Principles and Applications of Physics I**	**60**	**Pearson Set Assignment**											**LA A**	**LA A**	**LA A**
		6 hours per week 11–20, including 16 hours required for assessment														
4	**Investigative Project Skills**	**120**	**Internal Assessment**	**LA A**	**LA A**	**LA A**	**LA A**	**INT**	**INT**	**LA B**	**LA B**	**LA B**	**LA B**	**LA B**	**INT**	**INT**
		4 hours per week 1–30														

				YEAR 1 TERM 2												
Unit	**Unit title**	**Guided learning hours**	**Assessment method**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**
2	**Principles and Applications of Chemistry I**	**60**	**Pearson Set Assignment**	**PSA**	**PSA**											
		4 hours per week 1–15, including 22 hours required for assessment														
3	**Principles and Applications of Physics I**	**60**	**Pearson Set Assignment**	**LA B**	**LA B**	**LA B**	**LA B**	**RS/PSA**	**PSA**	**PSA**						
		6 hours per week, 11–20, including 16 hours required for assessment														
4	**Investigative Project Skills**	**120**	**Internal Assessment**	**INT**	**LA C/D**	**LA C/D**	**LA C/D**	**LA C/D**	**LA C/D**	**LA C/D**	**LA C/D**	**INT**	**INT**	**INT**	**INT**	**INT**
		4 hours per week 1–30														
5	**Principles and Applications of Biology II**	**60**	**Internal Assessment**			**LA A**	**LA A**	**LA A**	**INT**	**INT**	**LA B**	**LA B**	**LA B**	**INT**	**INT**	**LA C**
		4 hours per week 16–30														
6	**Principles and Applications of Chemistry II**	**60**	**Internal Assessment**								**LA A**	**LA A/ INT**	**INT/ LA B**	**LA B**	**LA B/ INT**	**INT/ LA C**
		6 hours per week 21–30														

				YEAR 1 TERM 3												
Unit	**Unit title**	**Guided learning hours**	**Assessment method**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**
4	**Investigative Project Skills**	**120**	**Internal Assessment**	**LA D**	**INT**	**INT**	**INT**									
		4 hours per week 1–30														
5	**Principles and Applications of Biology II**	**60**	**Internal Assessment**	**LA C**	**LA C**	**INT**	**INT**									
		4 hours per week 16–30														
6	**Principles and Applications of Chemistry II**	**60**	**Internal Assessment**	**LA C/ INT**	**LA D**	**LA D/ INT**	**INT**									
		6 hours per week 21–30														
7	**Principles and Applications of Physics II**	**60**	**Internal Assessment**					**LA A**	**LA A**	**LA A/ INT**	**INT**	**LA B**	**LAB**	**LA B/ INT**	**INT**	**INT**
		7 hours per week 31–38, then 4 hours in week 39														
11	**Functional Physiology of Human Body Systems**	**60**	**Internal Assessment**					**LA A**	**LA A**	**INT**	**LA B**	**LA B**	**INT**	**LA C**	**LA C**	**INT**
		7 hours per week 31–38, then 4 hours in week 39														

				YEAR 2 TERM 1												
Unit	**Unit title**	**Guided learning hours**	**Assessment method**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
8	Contemporary Issues in Science	120	Pearson Set Assignment	LA A	LA A	LA A	LA A	LA A	LA A	LA B	LA B	LA B	LA B	LA B	LA B	LA C
		4 hours per week 1–30, including 20 hours required for assessment														
14	Genetics and Genetic Engineering	60	Internal Assessment	LA A	LA A/ INT	INT/ LA B	LA B	INT/ LA C	LA C	INT/ LA D	LA D	LA D/ INT	INT			
		6 hours per week 1–10														
15	Diseases and Infections	60	Internal Assessment	LA A	LA A/ INT	INT	LA B	LA B	INT	INT/ LA C	LA C	LA C/ INT	INT	LA D	LA D	LA D
		4 hours per week 1–15														
16	Applications of Inorganic Chemistry	60	Internal Assessment											LA A	LA A/ INT	INT/ LA B
		6 hours per week 11–20														

				YEAR 2 TERM 2												
Unit	**Unit title**	**Guided learning hours**	**Assessment method**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**
8	Contemporary Issues in Science	120	Pearson Set Assignment	LA C	LA C	LA C	LA C	LA C	LA D	LA D	LA D	LA D	LA D	LA D	LA D	PSA
		4 hours per week 1–30, including 20 hours required for assessment														
15	Diseases and Infections	60	Internal Assessment	INT	INT											
		4 hours per week 1–15														
16	Applications of Inorganic Chemistry	60	Internal Assessment	LA B/ INT	LA C	LA C/ INT	LA D	LA D	LA D/ INT	INT						
		6 hours per week 11–20														
17	Electrical Circuits and their Applications	60	Internal Assessment			LA A/B	LA A/B	LA A/B	LA A/B	INT	INT	INT	LA C	LA C	INT	INT
		4 hours per week 16–30														
19	Microbiology and Microbiological Techniques	60	Internal Assessment								LA A/B	LA A/B	LA A/B	INT	INT	LA C/D
		6 hours per week 21–30														

				YEAR 2 TERM 3												
Unit	**Unit title**	**Guided learning hours**	**Assessment method**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**
8	**Contemporary Issues in Science**	**120**	**Pearson Set Assignment**	**PSA**	**PSA**	**PSA**	**PSA**									
		4 hours per week 1–30, including 20 hours required for assessment														
17	**Electrical Circuits and their Applications**	**60**	**Internal Assessment**	**LA D**	**LA D**	**INT**	**INT**									
		4 hours per week 16–30														
19	**Microbiology and Microbiological Techniques**	**60**	**Internal Assessment**	**LA C/D**	**LA C/D**	**INT**	**INT**									
		6 hours per week 21–30														
22	**Medical Physics Applications**	**60**	**Internal Assessment**					**LA A/B**	**LA A/B**	**LA A/B**	**INT**	**INT**	**LA C**	**LA C**	**INT**	**INT**
		7 hours per week 31–38, then 4 hours in week 39														
28	**Sustainable Energy**	**60**	**Internal Assessment**					**LA A**	**LA A/ INT**	**INT/ LA B**	**LA B**	**INT**	**INT/ LA C**	**LA C**	**INT**	**INT**
		7 hours per week 31–38, then 4 hours in week 39														

Section 3: Sample two-year plan – detailed rationale

Overview

The Level 3 Extended Diploma in Applied Science suggests 1080 guided learning hours (GLH) and comprises eight mandatory units and eight optional units. Four of the mandatory units are internally assessed, using a Pearson Set Assignment. The four remaining mandatory units and all eight optional units are assessed using a centre-designed assignment or the Authorised Assignment Briefs for the unit.

The qualification structure identifies the mandatory and optional units, and this information is also listed in the qualification specification. To achieve any qualification grade, learners must complete and have an outcome (D, M, P or U) for all units within a valid combination for the size of the award. For the Extended Diploma in Applied Science, learners must pass all mandatory units, along with five units worth 300 GLH from the optional units. This means that learners could attain a U grade in up to three the optional units and still achieve a passing grade overall, depending on their other results. Please see pages 395–412 of the specification for more details about compensation and grading.

The Sample Delivery Plan is based on the qualification being delivered over two years, with lesson times totalling 14 hours per week.

If your centre is subject to Standards Verification, your Standards Verifier will confirm sampling arrangements with you in order to meet the first sampling deadline of the end of May. The Sample Delivery Plan ensures that three Pearson Set Assignments (*Units 1, 2* and *3: Principles and Applications of Biology I*, *Chemistry I* and *Physics I* respectively) are completed in year 1. *Unit 8: Contemporary Issues in Science* is also assessed using a Pearson Set Assignment. This is a 120 GLH unit and will be delivered and assessed in year 2 of the programme. Apart from Unit 8, all other mandatory units will be completed and available for standards verification to meet the sampling deadline in the first year of delivery. Time must be available before the end of the academic year for second sampling and/or a re-sit for the set assignments, should this be required. It is important that you have at least one completed unit ready for Standards Verification to take place as early as possible.

Involving employers in the assessment/delivery

There is no compulsory requirement for a work experience placement within the qualification. All units lend themselves to a range of employer involvement, for example, in the form of an educational visit, guest speaker, focus group or case study.

Which units are assessed by Pearson Set Assignments?

Units 1, 2, 3 and 8 will be assessed by Pearson Set Assignments. The assignments will be available from September. The assignments can be taken at any time in the year. There is no opportunity for a resubmission of evidence. A new Pearson Set Assignment must be used by any learner(s) who need to improve their grade. Two set assignments – one for the first attempt and one for a re-sit, if required – are available for each one-year period.

Mandatory units

Unit 1: Principles and Applications of Biology I. Learners will study key concepts in cellular biology, human anatomy and physiology. The Pearson Set Assignment requires a supervised assessment period of 15 hours. Two are available for each one-year period.

Unit 2: Principles and Applications of Chemistry I. This unit covers some of the key concepts in chemistry: atomic structure, bonding, the Periodic Table and reacting quantities. The Pearson Set Assignment requires a supervised assessment period of 22 hours. Two are available for each one-year period.

Unit 3: Principles and Applications of Physics I. Some of the key concepts in physics are the focus of this unit: electromagnetic waves in communication, and fundamental aspects of forces and motion in transportation. The Pearson Set Assignment requires a supervised assessment period of 16 hours. Two are available for each one-year period.

Unit 4: Investigative Project Skills. This unit enables learners to gain and demonstrate the skills required to research, plan, carry out, communicate and evaluate the findings of an investigative project. The unit has 120 GLH and an in-depth extensive investigation, designed by each learner individually, in collaboration with the tutor, is required. The unit is internally assessed via centre-designed assignments or the Authorised Assignment Briefs.

Unit 5: Principles and Applications of Biology II. Learners will explore biological molecules and pathways, and their relevance to diseases, disorders, treatments and therapies. Physiological and psychological disorders will be studied. Development of treatments and associated ethical, moral and legal issues will be examined. This 60 GLH unit is internally assessed via centre-designed assignments or the Authorised Assignment Briefs.

Unit 6: Principles and Applications of Chemistry II. This unit builds on and extends the range of key science concepts in chemistry that were covered in *Unit 2: Principles and Applications of Chemistry I*. Topics include energetics, rate of reaction and equilibrium, structures, names, reactions and properties of commercially important organic compounds. It requires a lot of practical work to be carried out for assessment. This 60 GLH unit is internally assessed via centre-designed assignments or the Authorised Assignment Briefs.

Unit 7: Principles and Applications of Physics II. This unit covers two important areas of physics: thermal physics, materials and fluids, and the essential aspects of radioactivity. This 60 GLH unit is internally assessed via centre-designed assignments or the Authorised Assignment Briefs.

Unit 8: Contemporary Issues in Science. This unit will enable learners to develop their skills and understanding in evaluating the impact of contemporary scientific issues, and how they are discussed in publications. Assessment will cover environmental, ethical, moral, social, political and/or financial impact of issues from advances in medical treatments, including stem cell therapy and genetic engineering, to developments in nanotechnology and food technology. The Pearson Set Assignment requires a supervised assessment period of 20 hours.

Suggestions for which units to teach in year 1

Units 1, 2 and 3 are mandatory units, assessed internally via a Pearson Set Assignment. Learners must achieve a pass in these units to achieve an overall grade for the Applied Science Extended Diploma programme (or as a 'fallback' for the smaller Applied Science programmes) to be awarded. Four other internally assessed mandatory units (Units 4–7), along with one optional unit, need to be delivered in year 1.

Staff availability, expertise and resources will influence how units are delivered. Units can be delivered 'long and thin' or 'short and fat', as determined by the centre. Both approaches have advantages and disadvantages. 'Long and thin' delivery usually allows a 'specialist' to deliver the unit over the course of the year; this methodology means that learners have to wait a long time before they have completed an assignment and can receive feedback on their actual achievement. It also means that assessment tends to be concentrated at the end of the academic year. 'Short and fat' delivery and assessment means that units are completed in a short time frame, allowing learners to be aware of their actual achievement unit by unit during the year. This methodology may mean that staff have to deliver a unit which is 'outside their comfort zone'. This can be mitigated by selecting optional units to complement staff expertise, and which can be delivered once the mandatory units have been completed.

The delivery chart above suggests Units 1, 2 and 3 should be taught as early as possible in the programme, as they cover fundamental principles of the three main science disciplines which other units incorporate and extend. This would also allow the mandatory assessment time to be made available should a re-sit be required. All three Pearson Set Assignments can be assessed by the middle of term 2; this will allow all stakeholders to know that standards are being met. In the unlikely event that this is not the case, there is plenty of time for a re-sit. While the Delivery Plan shows *Unit 1: Principles and Applications of Biology I* being delivered first, followed by Unit 2 and then Unit 3, the units can, of course, be delivered in any order to suit the needs of the centre. There are no authorised assignment briefs for Units 1, 2 and 3. Learners need to be aware of the assessment criteria and understand how they can be met; the Pearson Set Assignment will then be used for formal assessment.

The mandatory internally assessed Units 5 and 6 are also being delivered early in the year. Unit 7 is shown as being delivered at the end of the year; however, the order can be changed. These three units build on and introduce other key concepts for the three science disciplines, biology, chemistry and physics, that will support delivery of the optional units in year 2.

Unit 4: Investigative Project Skills. There is a maximum of three assessment opportunities, and learning aims C and D are funnelled. This unit enables learners to gain and demonstrate the skills required to research, plan, carry out, communicate and evaluate the findings of an investigative project. The unit has 120 GLH and an in-depth extensive investigation, designed by each learner individually, in collaboration with the tutor, is required. The unit is being delivered 4 hours a week over 30 weeks. Best practice in this unit has assessors offering a list of potential projects from which the learners can choose and then develop a workable project plan. They will then need to carry out the plan and repeat experiments, if required, to gain valid and reliable data that can be analysed and evaluated. The findings must be evaluated and communicated in a coherent report which demonstrates correct reporting protocols and scientific terminology.

Unit 11: Functional Physiology of Human Body Systems is an optional 60 GLH unit. Learners will focus on the physiological make-up of three human body systems (digestive, endocrine and nervous systems), how the systems function and what occurs during dysfunction. Learners will also explore the role of homeostasis in controlling and coordinating the body systems. This unit has been included for delivery in year 1. Delivery and assessment will be over nine weeks and time will need to be shared between staff when Units 1–6 have been completed; this is also the case for Unit 7. Nine weeks of 7 hours will give 63 hours of teaching time for each of Units 7 and 11. It may also be possible to begin teaching and learning for an optional unit from year 2.

Suggestions for which units to teach in year 2

The remaining mandatory Unit 8 and seven optional units will need to be delivered and internally assessed during this year. The units selected in the delivery chart above cover a range of science disciplines and topics. The selection of units will be determined by staff expertise and the needs of learners and, as they are all 60 GLH, they can be substituted as required.

Unit 8: Contemporary Issues in Science requires 120 GLH and is assessed by a Pearson Set Assignment. Learners will need a lot of support and guidance to understand issues that may be assessed in this unit. Delivering it long and thin will allow learners to discuss environmental, ethical, moral, social, political and/or financial impact of issues from advances in medical treatments, including stem cell therapy and genetic engineering, to developments in nanotechnology and food technology, as they arise in other units and in daily news reports.

Unit 14: Genetics and Genetic Engineering. Learning aims A and B require learners to understand the structure and function of nucleic acids, the process of cell division and its role in genetic variation. Practical work is required for assessment for learning aim B, and practice and guidance will be required during teaching and learning to allow learners to develop the necessary microscopy skills. There is an opportunity to link with *Unit 19: Microbiology and Microbiological Techniques*, which also requires microscopy skills. Learning aim C requires practical work to carry out investigations to collect and record data for mono and dihybrid ratios. While the Delivery Plan shows a linear progression through the learning aims, it may be necessary to allow time during learning aim A or B for learners to start breeding programmes using, for example, *Drosophila*. The centre could consider running leaning aim C long and thin alongside A and B to facilitate this. The ordering of equipment and livestock will need to be considered.

Unit 15: Diseases and Infections. Learning aims A and B require learners to investigate infectious and non-infectious diseases, their causes, effects on the body and how transmission of infectious diseases can be prevented. Learning aim C concentrates on environmental pollution, its causes, effects on human health and methods of reducing pollution. Learning aim D requires an understanding of the defence mechanisms of the human body. There is no requirement for assessment of practical work for this unit, but learners will undoubtedly benefit from opportunities to carry out practical work – for example, modelling the transmission of disease – and links can be made with *Unit 19: Microbiology and Microbiological Techniques*.

Unit 16: Applications of Inorganic Chemistry. This unit covers four important inorganic chemistry topics: inorganic compounds and transition metal complexes, solubility and energetics of ionic compounds, acid-base equilibria and buffer action, and redox reactions. Practical work is required for assessment for all four learning aims and time will need to be available for learners to acquire the necessary skills for assessment prior to the tasks in the assignment briefs being undertaken for assessment.

Unit 17: Electrical Circuits and their Applications. There is a maximum of three assessment opportunities. Learning aims A and B are funnelled. This unit covers the principles of electricity, including measurements of electrical values and health and safety, the construction of circuits and their use in society today. Learners will explore what electricity is and how to use measuring devices and construct circuits, as well as gain an understanding of the many varied applications of electricity in our everyday lives. Practical investigations and reports on aspects of electrical measurement, using mathematical relationships to explain readings while developing an understanding of the importance of correct calculations to determine how circuits behave, are required.

For *Unit 19: Microbiology and Microbiological Techniques*, there is a maximum of two assessment opportunities for this unit. Learning aims A and B are funnelled, as are learning aims C and D. Practical work on microscopy is required for learning aim B, which must be assessed with learning aim A, the importance of microbial structure and classification. There are opportunities to link microscopy work for this unit with *Unit 15: Diseases and Infections*. Learning aim C requires learners to undertake aseptic techniques to culture microorganisms. For learning aim D, learners must carry out investigations to explore factors controlling microbial growth. Laboratory time and equipment for assessment, as well as teaching and learning, will need to be available to learners. Careful time management will be required and holidays must be considered when the unit is being timetabled.

For *Unit 22: Medical Physics Applications*, there is a maximum of two assessment opportunities. Learning aims A and B are funnelled. This unit gives learners an understanding of the principles and production of ionising and non-ionising radiation, applications of medical physics, and their uses in the diagnosis and treatment of the human body. An understanding of health and safety, associated risks, side effects and limitations of ionising and non-ionising instrumentation techniques in medical applications is required. No practical work is required for assessment but learners would benefit from input from visiting a medical physics department or a visit from a practitioner.

Unit 28: Sustainable Energy covers the issues surrounding the global use of fossil fuels and the need to find alternative, clean and sustainable energy sources. The impact of fossil fuels and the generation of alternative fuel sources will be explored in terms of social, environmental and financial significance. No fieldwork is required so the unit could be delivered at any time of the year.

All unit content must be delivered. The assessor should decide when the learner is suitably prepared to undertake the assessment. Learners need to understand their responsibilities for assessment and the centre's arrangements. It is important that learners understand how assignments are used, the importance of meeting assignment deadlines and that all the work submitted for assessment must be their own.

NB: internally assessed units can be sampled only when all learners have completed the unit, and when resubmissions have occurred, been assessed and internally verified. All units must be available for first sampling and reporting to have occurred by the appropriate deadline in the year of certification.