BTEC Level 3

Pearson BTEC Level 3 Certificate,
BTEC Level 3 Subsidiary Diploma,
BTEC Level 3 90-credit Diploma,
BTEC Level 3 Diploma and
BTEC Level 3 Extended Diploma in

Applied Science

Specification

For first teaching September 2010
90-credit Diploma – first teaching September 2012
Issue 3

ALWAYS LEARNING

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Edexcel, BTEC and LCCI qualifications

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These qualifications were previously known as:

Edexcel BTEC Level 3 Certificate in Applied Science (QCF)

Edexcel BTEC Level 3 Subsidiary Diploma in Applied Science (QCF)

Edexcel BTEC Level 3 90-credit Diploma in Applied Science (QCF)

Edexcel BTEC Level 3 Diploma in Applied Science (QCF)

Edexcel BTEC Level 3 Extended Diploma in Applied Science (QCF)

The QNs remain unchanged.

This specification is Issue 3. Key changes are sidelined. We will inform centres of any changes to this issue. The latest issue can be found on our website at qualifications.pearson.com

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All information in this specification is correct at time of publication.

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Contents

The units for the BTEC qualifications in this specification are available on our website (qualifications.pearson.com).

BTEC qualification titles covered by this specification

Pearson BTEC Level 3 Certificate in Applied Science

Pearson BTEC Level 3 Subsidiary Diploma in Applied Science

Pearson BTEC Level 3 90-credit Diploma in Applied Science

Pearson BTEC Level 3 Diploma in Applied Science

Pearson BTEC Level 3 Extended Diploma in Applied Science

These qualifications have been accredited to the National Framework.
Your centre should use the Qualification Number (QN) when seeking funding for learners.

The Qualification Number (QN) for the qualifications in this publication are:

Pearson BTEC Level 3 Certificate in Applied Science	500/6726/6
Pearson BTEC Level 3 Subsidiary Diploma in Applied Science	500/6725/4
Pearson BTEC Level 3 90-credit Diploma in Applied Science	600/5849/3
Pearson BTEC Level 3 Diploma in Applied Science	500/6673/0
Pearson BTEC Level 3 Extended Diploma in Applied Science	500/6720/5

The appropriate qualification title, QN and unit reference number (URN) will appear on each learner's certificate. You should tell your learners this when your centre recruits them and registers them with us.

What are BTEC Level 3 qualifications?

The BTEC qualifications in this specification are undertaken in further education, by sixth-form colleges, schools and other training providers, and have been since they were introduced in 1984. Their purpose, approaches to teaching, learning and assessment are established and understood by teaching professionals, employers and learners alike.

The BTEC qualifications in this specification are:

- Pearson BTEC Level 3 Certificate in Applied Science
- Pearson BTEC Level 3 Subsidiary Diploma in Applied Science
- Pearson BTEC Level 3 90-credit Diploma in Applied Science
- Pearson BTEC Level 3 Diploma in Applied Science
- Pearson BTEC Level 3 Extended Diploma in Applied Science.

They maintain the same equivalences, benchmarks and other articulations (for example SCAAT points, UCAS Tariff points) as their predecessor qualifications. The table below identifies the titling conventions and variations between the 'old' (NQF) and 'new' qualifications:

Predecessor BTEC Nationals (accredited 2007)	**BTEC Level 3 qualifications** (for delivery from September 2010)
Not applicable	Pearson BTEC Level 3 Certificate
Edexcel Level 3 BTEC National Award	Pearson BTEC Level 3 Subsidiary Diploma
Not applicable	Pearson BTEC Level 3 90-credit Diploma
Edexcel Level 3 BTEC National Certificate	Pearson BTEC Level 3 Diploma
Edexcel Level 3 BTEC National Diploma	Pearson BTEC Level 3 Extended Diploma

The BTEC qualifications in this specification are designed to provide highly specialist, work-related qualifications in a range of vocational sectors. They give learners the knowledge, understanding and skills that they need to prepare for employment. These qualifications accredit the achievement for courses and programmes of study for full-time or part-time learners in schools, colleges and other training provider organisations. The qualifications provide career development opportunities for those already in work, and progression opportunities to higher education, degree and professional development programmes within the same or related areas of study, within universities and other institutions.

The BTEC qualifications in this specification provide much of the underpinning knowledge and understanding for the National Occupational Standards for the sector, where these are appropriate. They are supported by the relevant Sector Skills Councils (SSCs) and/or Standards Setting Bodies (SSBs). Certain BTEC qualifications are recognised as Technical Certificates and form part of the Apprenticeship Framework. They attract UCAS points that equate to similar-sized general qualifications within education institutions within the UK.

On successful completion of a BTEC level 3 qualification, a learner can progress to or within employment and/or continue their study in the same, or related vocational area.

Total Qualification Time

For all regulated qualifications, Pearson specifies a total number of hours that it is expected the average learner will be required to undertake in order to complete and show achievement for the qualification: this is the Total Qualification Time (TQT).

Within this, Pearson will also identify the number of Guided Learning Hours (GLH) that we expect a centre delivering the qualification will need to provide. Guided learning means activities that directly or immediately involve tutors and assessors in teaching, supervising, and invigilating learners, such as lessons, tutorials, online instruction, supervised study giving feedback on performance.

In addition to guided learning, other required learning directed by tutors or assessors will include private study, preparation for assessment and undertaking assessment when not under supervision, such as preparatory reading, revision and independent research.

These qualifications also have a credit value, which is equal to one tenth of TQT. Pearson consults with users of these qualifications in assigning TQT and credit values.

This suite of BTEC Level 3 qualifications is available in the following sizes:

- Certificate – 300 TQT (30 credits, 180 GLH)
- Subsidiary Diploma – 600 TQT (60 credits, 360 GLH)
- 90-credit Diploma – 900 TQT (90 credits, 540 GLH)
- Diploma – 1200 TQT (120 credits, 720 GLH)
- Extended Diploma – 1800 TQT (180 credits, 1080 GLH).

Pearson BTEC Level 3 Certificate – 30 credits

The 30-credit BTEC Level 3 Certificate offers a specialist qualification that focuses on particular aspects of employment within the appropriate vocational sector. The BTEC Level 3 Certificate is a qualification which can extend a learner's programme of study and give vocational emphasis. The BTEC Level 3 Certificate is broadly equivalent to one GCE AS Level.

The BTEC Level 3 Certificate is also suitable for more mature learners, who wish to follow a vocational programme of study as part of their continued professional development or who want to move to a different area of employment.

Pearson BTEC Level 3 Subsidiary Diploma – 60 credits

The 60-credit BTEC Level 3 Subsidiary Diploma extends the specialist work-related focus of the BTEC Level 3 Certificate qualification and covers the key knowledge and practical skills required in the appropriate vocational sector. The BTEC Level 3 Subsidiary Diploma offers greater flexibility and a choice of emphasis through the optional units. It is broadly equivalent to one GCE A Level.

The BTEC Level 3 Subsidiary Diploma offers an engaging programme for those who are clear about the area of employment that they wish to enter. These learners may wish to extend their programme through the study of a general qualifications such as GCE AS Levels, additional specialist learning (eg through another BTEC qualification) or a complementary NVQ. These learning programmes can be developed to allow learners to study related and complementary qualifications without duplicating of content.

For adult learners, the BTEC Level 3 Subsidiary Diploma can extend their experience of work in a particular sector. It may also be a suitable qualification for those wishing to change career or move into a particular area of employment following a career break.

Pearson BTEC Level 3 90-credit Diploma – 90 credits

This qualification broadens and expands the specialist work-related focus of the BTEC Level 3 Subsidiary Diploma and encompasses the essential skills, knowledge and understanding needed to gain confidence and progression.

There is potential for the qualification to prepare learners for progression within education or into employment in the appropriate vocational sector and it is suitable for those who have decided that they wish to study in detail or work in a particular area of work. It is broadly equivalent to 1.5 GCE A Levels and provides a programme of study manageable in a year so that learners can bank and then build on their achievement. In this way it encourages progression for those learners who wish to undertake a one-year course of study because of individual circumstances.

Some learners may wish to gain the qualification in order to enter a specialist area of employment or to progress to a larger or different level 3 programme. Other learners may want to extend the specialism they studied on the BTEC Level 3 Certificate or the BTEC Level 3 Subsidiary Diploma programme. Learners may also be able to use the BTEC Level 3 90-credit Diploma to gain partial achievement and have the requisite skills, knowledge and understanding needed in the sector.

For adult learners the BTEC Level 3 90-credit Diploma can extend their experience of working in a particular sector. It could also be a suitable qualification for those wishing to change career or move into a particular area of employment following a career break.

Pearson BTEC Level 3 Diploma – 120 credits

The 120-credit BTEC Level 3 Diploma broadens and expands the specialist work-related focus of the BTEC Level 3 Subsidiary Diploma and the BTEC Level 3 90-credit Diploma qualifications. There is potential for the qualification to prepare learners for employment in the appropriate vocational sector and it is suitable for those who have decided that they wish to enter a particular area of work. It is broadly equivalent to two GCE A Levels.

Some learners may wish to gain the qualification in order to enter a specialist area of employment or to progress to a level 4 programme. Other learners may want to extend the specialism they studied on the BTEC Level 3 Certificate, BTEC Level 3 Subsidiary Diploma or the BTEC Level 3 90-credit Diploma programme.

Pearson BTEC Level 3 Extended Diploma – 180 credits

The 180-credit BTEC Level 3 Extended Diploma extends and deepens the specialist work-related focus of the BTEC Level 3 90-credit Diploma and the BTEC Level 3 Diploma qualifications. There is potential for the qualification to prepare learners for appropriate direct employment in the vocational sector and it is suitable for those who have decided that they clearly wish to enter a particular specialist area of work. It is broadly equivalent to three GCE A Levels.

Some learners may wish to gain the qualification in order to enter a specialist area of employment or to progress to a higher education foundation degree, HND or other professional development programme. Other learners may want to extend the specialist nature of the subjects they studied on the BTEC Level 3 Diploma or another programme of study.

Key features of these BTEC qualifications in Applied Science

The BTEC qualifications in this specification have been developed in the science sector to:

- give learners the opportunity to acquire technical and employability skills, knowledge and understanding which are transferable and will enable individuals to meet changing circumstances, whether these arise from a shift in their own status or employment, or general changes in applied science practice, provision or environment
- provide education and training for science employees to develop their underpinning knowledge and scientific skills
- give science employees opportunities to achieve a nationally recognised level 3 vocationally-specific qualification
- give full-time learners the opportunity to enter employment in the science sector or to progress to vocational qualifications such as the Pearson BTEC Higher Nationals in Applied Biology, Applied Chemistry or health-related or other science-related qualifications
- increase understanding of the role of the science technician or assistant practitioner, their relationship with the scientific community and their responsibilities towards the community and the environment
- give learners the opportunity to develop a range of skills and techniques, personal skills and attributes essential for successful performance in working life.

Rationale for these BTEC qualifications in Applied Science

The Pearson BTEC qualifications in this specification are a suite of qualifications that reflect aspects of employment within science organisations or organisations that use science and enable learners to develop practical scientific skills. These qualifications will appeal to learners who prefer portfolio-based assessment covering a variety of scientific investigations.

Units within the qualification cover areas of laboratory science, forensic science, medical science, environmental science and biological, chemical and physical science to provide a route to employment in the science industry or within organisations that use science. These can include roles such as:

- working as a quality control technician/analyst, where the employee works in a production plant laboratory carrying out analytical tests using modern instrumentation, ICT and data interpretation
- working in a hospital as a medical physics technician supporting the use of X-ray and other imaging/scanning equipment
- working in a research laboratory in the development of new drugs. Managing projects that include setting up apparatus, measuring and handling chemical substances, following procedures, carrying out observations and measurements, separating and analysing products
- working in the chemical industry, involved with testing materials
- working with the forensic science service or using their analytical skills in the chemistry industry
- working in chemical companies developing fertilisers and other plant feeds
- working for a scientific magazine or journal, editing and proofreading articles on issues such as applications and implications of new scientific discoveries and developments
- working in a biotechnology laboratory carrying out fermentation and purification processes.

National Occupational Standards

These BTEC qualifications are designed to provide much of the underpinning knowledge and understanding for the National Occupational Standards (NOS), as well as developing practical skills in preparation for work and possible achievement of NVQs. NOS form the basis of National Vocational Qualifications (NVQs). The qualifications in this specification do not purport to deliver occupational competence in the sector, which should be demonstrated in a work context.

Each unit in the specification identifies links to elements of the NOS that are addressed by the outcomes and content of the unit. The BTEC level 3 qualifications in Applied Science provide underpinning knowledge towards the Laboratory and Associated Technical Activities NOS at level 3 and relate to a number of units within the Laboratory Science NOS at level 3.

See *Annexe E* for details of NOS mapping against units.

Rules of combination for Pearson BTEC Level 3 qualifications in this specification

The rules of combination specify the:

- total credit value of the qualification
- the minimum credit to be achieved at, or above, the level of the qualification
- the mandatory unit credit
- the optional unit credit
- the maximum credit that can come from other level 3 BTEC units in this qualification suite.

When combining units for a BTEC qualification, it is the centre's responsibility to ensure that the following rules of combination are adhered to.

Pearson BTEC Level 3 Certificate

1 Qualification credit value: a minimum of 30 credits.

2 Minimum credit to be achieved at, or above, the level of the qualification: 23 credits.

3 Mandatory unit credit: 30 credits.

4 Optional unit credit: 0 credits.

5 This qualification is not designed to include other level 3 BTEC units.

Pearson BTEC Level 3 Subsidiary Diploma

1 Qualification credit value: a minimum of 60 credits.

2 Minimum credit to be achieved at, or above, the level of the qualification: 45 credits.

3 Mandatory unit credit: 30 credits.

4 Optional unit credit: 30.

5 A maximum of 5 optional credits can come from other level 3 BTEC units to meet local needs.

Pearson BTEC Level 3 90-credit Diploma

1 Qualification credit value: a minimum of 90 credits.

2 Minimum credit to be achieved at, or above, the level of the qualification: 85 credits.

3 Mandatory unit credit: 40 credits.

4 Optional unit credit: 50 credits.

5 A maximum of 10 optional credits can come from other level 3 BTEC units to meet local needs.

Pearson BTEC Level 3 Diploma

1 Qualification credit value: a minimum of 120 credits.

2 Minimum credit to be achieved at, or above, the level of the qualification: 90 credits.

3 Mandatory unit credit: 55 credits.

4 Optional unit credit: 65.

5 A maximum of 15 optional credits can come from other level 3 BTEC units to meet local needs.

Pearson BTEC Level 3 Extended Diploma

1 Qualification credit value: a minimum of 180 credits.

2 Minimum credit to be achieved at, or above, the level of the qualification: 135 credits.

3 Mandatory unit credit: 55 credits.

4 Optional unit credit: 125.

5 A maximum of 30 optional credits can come from other level 3 BTEC units to meet local needs.

Pearson BTEC Level 3 Certificate in Applied Science

The Pearson BTEC Level 3 Certificate in Applied Science has 30 credits and has 180 guided learning hours. It consists of **three** mandatory units that provide for a combined total of 30 credits.

The units for the BTEC qualifications in this specification are available on our website (qualifications.pearson.com).

Pearson BTEC Level 3 Certificate in Applied Science			
Unit	**Mandatory units**	**Credit**	**Level**
1	Fundamentals of Science	**10**	**3**
2	Working in the Science Industry	**10**	**3**
4	Scientific Practical Techniques	**10**	**3**

Pearson BTEC Level 3 Subsidiary Diploma in Applied Science

The Pearson BTEC Level 3 Subsidiary Diploma in Applied Science has 60 credits and has 360 guided learning hours. It consists of **three** mandatory units **plus** optional units that provide for a combined total of 60 credits (where at least 45 credits must be at level 3 or above).

The units for the BTEC qualifications in this specification are available on our website (qualifications.pearson.com).

Pearson BTEC Level 3 Subsidiary Diploma in Applied Science			
Unit	**Mandatory units**	**Credit**	**Level**
1	Fundamentals of Science	**10**	**3**
2	Working in the Science Industry	**10**	**3**
4	Scientific Practical Techniques	**10**	**3**
	Optional units		
5	Perceptions of Science	**10**	**3**
6	Using Mathematical Tools in Science	**5**	**2**
7	Mathematical Calculations for Science	**5**	**3**
8	Using Statistics in Science	**5**	**3**
9	Informatics in Science	**5**	**3**
10	Using Science in the Workplace	**10**	**3**
11	Physiology of Human Body Systems	**10**	**3**
12	Physiology of Human Regulation and Reproduction	**10**	**3**
13	Biochemistry and Biochemical Techniques	**10**	**3**
14	Energy Changes, Sources and Applications	**10**	**3**
15	Microbiological Techniques	**10**	**3**
16	Chemistry for Biology Technicians	**10**	**3**
17	Electrical Circuits and their Applications	**10**	**3**
18	Genetics and Genetic Engineering	**10**	**3**
Unit	**Optional units** *(continued)*	**Credit**	**Level**
19	Practical Chemical Analysis	**10**	**3**

Pearson BTEC Level 3 Subsidiary Diploma in Applied Science			
20	Medical Physics Techniques	10	3
22	Chemical Laboratory Techniques	10	3
23	Science for Environmental Technicians	10	3
24	Principles of Plant and Soil Science	10	3
26	Industrial Chemical Reactions	10	3
27	Chemical Periodicity and Its Applications	10	3
28	Industrial Applications of Organic Chemistry	10	3
42	Geology of Natural Resources	10	3
44	Astronomy	10	3
45	Basic Polymer Technology	10	3
46	Plastics Materials	10	3
47	Plastics Processing	10	3
48	Polymer Process Engineering	10	3
49	Rubber Products and Specialist Elastomers	10	3
50	Rubber Technology	10	3
51	Mechanical and Thermal Treatment of Metals	10	3
52	Structure and Properties of Metals	10	3
53	Extraction and Refining of Metals	10	3

Pearson BTEC Level 3 Subsidiary Diploma in Applied Science (Applied Biology)

The Pearson BTEC Level 3 Subsidiary Diploma in Applied Science (Applied Biology) has 60 credits and has 360 guided learning hours. It consists of **two** mandatory units **plus** optional units that provide for a combined total of 60 credits (where at least 45 credits must be at level 3 or above).

The units for the BTEC qualifications in this specification are available on our website (qualifications.pearson.com).

Pearson BTEC Level 3 Subsidiary Diploma in Applied Science (Applied Biology)			
Unit	**Mandatory units**	**Credit**	**Level**
1	Fundamentals of Science	**10**	**3**
4	Scientific Practical Techniques	**10**	**3**
	Optional units		
2	Working in the Science Industry	**10**	**3**
5	Perceptions of Science	**10**	**3**
6	Using Mathematical Tools in Science	**5**	**2**
7	Mathematical Calculations for Science	**5**	**3**
8	Using Statistics in Science	**5**	**3**
9	Informatics in Science	**5**	**3**
10	Using Science in the Workplace	**10**	**3**
11	Physiology of Human Body Systems	**10**	**3**
12	Physiology of Human Regulation and Reproduction	**10**	**3**
13	Biochemistry and Biochemical Techniques	**10**	**3**
15	Microbiological Techniques	**10**	**3**
16	Chemistry for Biology Technicians	**10**	**3**
18	Genetics and Genetic Engineering	**10**	**3**
24	Principles of Plant and Soil Science	**10**	**3**

Pearson BTEC Level 3 Subsidiary Diploma in Applied Science (Applied Chemistry)

The Pearson BTEC Level 3 Subsidiary Diploma in Applied Science (Applied Chemistry) has 60 credits and has 360 guided learning hours. It consists of **two** mandatory units **plus** optional units that provide for a combined total of 60 credits (where at least 45 credits must be at level 3 or above).

The units for the BTEC qualifications in this specification are available on our website (qualifications.pearson.com).

Pearson BTEC Level 3 Subsidiary Diploma in Applied Science (Applied Chemistry)			
Unit	**Mandatory units**	**Credit**	**Level**
1	Fundamentals of Science	**10**	**3**
4	Scientific Practical Techniques	**10**	**3**
	Optional units		
2	Working in the Science Industry	**10**	**3**
5	Perceptions of Science	**10**	**3**
6	Using Mathematical Tools in Science	**5**	**2**
7	Mathematical Calculations for Science	**5**	**3**
8	Using Statistics in Science	**5**	**3**
9	Informatics in Science	**5**	**3**
10	Using Science in the Workplace	**10**	**3**
13	Biochemistry and Biochemical Techniques	**10**	**3**
19	Practical Chemical Analysis	**10**	**3**
22	Chemical Laboratory Techniques	**10**	**3**
26	Industrial Chemical Reactions	**10**	**3**
27	Chemical Periodicity and Its Applications	**10**	**3**
28	Industrial Applications of Organic Chemistry	**10**	**3**

Pearson BTEC Level 3 Subsidiary Diploma in Applied Science (Applied Physics)

The Pearson BTEC Level 3 Subsidiary Diploma in Applied Science (Applied Physics) has 60 credits and has 360 guided learning hours. It consists of **three** mandatory units **plus** optional units that provide for a combined total of 60 credits (where at least 45 credits must be at level 3 or above).

The units for the BTEC qualifications in this specification are available on our website (qualifications.pearson.com).

Pearson BTEC Level 3 Subsidiary Diploma in Applied Science (Applied Physics)			
Unit	**Mandatory units**	**Credit**	**Level**
1	Fundamentals of Science	**10**	**3**
3	Scientific Investigations	**10**	**3**
4	Scientific Practical Techniques	**10**	**3**
	Optional units		
2	Working in the Science Industry	**10**	**3**
5	Perceptions of Science	**10**	**3**
6	Using Mathematical Tools in Science	**5**	**2**
7	Mathematical Calculations for Science	**5**	**3**
8	Using Statistics in Science	**5**	**3**
9	Informatics in Science	**5**	**3**
10	Using Science in the Workplace	**10**	**3**
14	Energy Changes, Sources and Applications	**10**	**3**
17	Electrical Circuits and their Applications	**10**	**3**
20	Medical Physics Techniques	**10**	**3**
44	Astronomy	**10**	**3**

Pearson BTEC Level 3 Subsidiary Diploma in Applied Science (Medical Science)

The Pearson BTEC Level 3 Subsidiary Diploma in Applied Science (Medical Science) has 60 credits and has 360 guided learning hours. It consists of **three** mandatory units **plus** optional units that provide for a combined total of 60 credits (where at least 45 credits must be at Level 3 or above).

The units for the BTEC qualifications in this specification are available on our website (qualifications.pearson.com).

Pearson BTEC Level 3 Subsidiary Diploma in Applied Science (Medical Science)			
Unit	**Mandatory units**	**Credit**	**Level**
1	Fundamentals of Science	**10**	**3**
2	Working in the Science Industry	**10**	**3**
4	Scientific Practical Techniques	**10**	**3**
	Optional units		
5	Perceptions of Science	**10**	**3**
6	Using Mathematical Tools in Science	**5**	**2**
7	Mathematical Calculations for Science	**5**	**3**
8	Using Statistics in Science	**5**	**3**
9	Informatics in Science	**5**	**3**
10	Using Science in the Workplace	**10**	**3**
11	Physiology of Human Body Systems	**10**	**3**
12	Physiology of Human Regulation and Reproduction	**10**	**3**
13	Biochemistry and Biochemical Techniques	**10**	**3**
15	Microbiological Techniques	**10**	**3**
18	Genetics and Genetic Engineering	**10**	**3**
20	Medical Physics Techniques	**10**	**3**
21	Biomedical Science Techniques	**10**	**3**
41	Clinical Psychology	**10**	**3**
43	Diseases and Infections	**10**	**3**

Pearson BTEC Level 3 Subsidiary Diploma in Applied Science (Forensic Science)

The Pearson BTEC Level 3 Subsidiary Diploma in Applied Science (Forensic Science) has 60 credits and has 360 guided learning hours. It consists of **three** mandatory units **plus** optional units that provide for a combined total of 60 credits (where at least 45 credits must be at Level 3 or above).

The units for the BTEC qualifications in this specification are available on our website (qualifications.pearson.com).

Pearson BTEC Level 3 Subsidiary Diploma in Applied Science (Forensic Science)			
Unit	**Mandatory units**	**Credit**	**Level**
1	Fundamentals of Science	**10**	**3**
2	Working in the Science Industry	**10**	**3**
4	Scientific Practical Techniques	**10**	**3**
	Optional units		
5	Perceptions of Science	**10**	**3**
6	Using Mathematical Tools in Science	**5**	**2**
7	Mathematical Calculations for Science	**5**	**3**
8	Using Statistics in Science	**5**	**3**
9	Informatics in Science	**5**	**3**
10	Using Science in the Workplace	**10**	**3**
18	Genetics and Genetic Engineering	**10**	**3**
20	Medical Physics Techniques	**10**	**3**
22	Chemical Laboratory Techniques	**10**	**3**
31	Criminology	**10**	**3**
32	Forensic Evidence Collection and Analysis	**10**	**3**
33	Forensic Photography	**10**	**3**
34	Criminal Psychology	**10**	**3**

Pearson BTEC Level 3 90-credit Diploma in Applied Science

The Pearson BTEC Level 3 90-credit Diploma in Applied Science has 90 credits and has 540 guided learning hours. It consists of **four** mandatory units **plus** optional units that provide for a combined total of 90 credits (where at least 85 credits must be at Level 3 or above).

The units for the BTEC qualifications in this specification are available on our website (qualifications.pearson.com).

Pearson BTEC Level 3 90-credit Diploma in Applied Science			
Unit	**Mandatory units**	**Credit**	**Level**
1	Fundamentals of Science	**10**	**3**
2	Working in the Science Industry	**10**	**3**
3	Scientific Investigations	**10**	**3**
4	Scientific Practical Techniques	**10**	**3**
	Optional units		
5	Perceptions of Science	**10**	**3**
6	Using Mathematical Tools in Science	**5**	**2**
7	Mathematical Calculations for Science	**5**	**3**
8	Using Statistics in Science	**5**	**3**
9	Informatics in Science	**5**	**3**
10	Using Science in the Workplace	**10**	**3**
11	Physiology of Human Body Systems	**10**	**3**
12	Physiology of Human Regulation and Reproduction	**10**	**3**
13	Biochemistry and Biochemical Techniques	**10**	**3**
14	Energy Changes, Sources and Applications	**10**	**3**
15	Microbiological Techniques	**10**	**3**
16	Chemistry for Biology Technicians	**10**	**3**
17	Electrical Circuits and their Applications	**10**	**3**
18	Genetics and Genetic Engineering	**10**	**3**
19	Practical Chemical Analysis	**10**	**3**
20	Medical Physics Techniques	**10**	**3**
21	Biomedical Science Techniques	**10**	**3**
22	Chemical Laboratory Techniques	**10**	**3**
23	Science for Environmental Technicians	**10**	**3**
24	Principles of Plant and Soil Science	**10**	**3**
25	Electronics for Science Technicians	**10**	**3**
26	Industrial Chemical Reactions	**10**	**3**
27	Chemical Periodicity and Its Applications	**10**	**3**
28	Industrial Applications of Organic Chemistry	**10**	**3**
41	Clinical Psychology	**10**	**3**
42	Geology of Natural Resources	**10**	**3**
43	Diseases and Infections	**10**	**3**
44	Astronomy	**10**	**3**
45	Basic Polymer Technology	**10**	**3**

Pearson BTEC Level 3 90-credit Diploma in Applied Science			
Unit	**Optional units** *(continued)*	**Credit**	**Level**
46	Plastics Materials	**10**	**3**
47	Plastics Processing	**10**	**3**
48	Polymer Process Engineering	**10**	**3**
49	Rubber Products and Specialist Elastomers	**10**	**3**
50	Rubber Technology	**10**	**3**
51	Mechanical and Thermal Treatment of Metals	**10**	**3**
52	Structure and Properties of Metals	**10**	**3**
53	Extraction and Refining of Metals	**10**	**3**

Pearson BTEC Level 3 90-credit Diploma in Applied Science (Applied Biology)

The Pearson BTEC Level 3 90-credit Diploma in Applied Science (Applied Biology) has 90 credits and has 540 guided learning hours. It consists of **four** mandatory units **plus** optional units that provide for a combined total of 90 credits (where at least 85 credits must be at level 3 or above).

The units for the BTEC qualifications in this specification are available on our website (qualifications.pearson.com).

Pearson BTEC Level 3 90-credit Diploma in Applied Science (Applied Biology)			
Unit	**Mandatory units**	**Credit**	**Level**
1	Fundamentals of Science	**10**	**3**
2	Working in the Science Industry	**10**	**3**
3	Scientific Investigations	**10**	**3**
4	Scientific Practical Techniques	**10**	**3**
	Optional units		
5	Perceptions of Science	**10**	**3**
6	Using Mathematical Tools in Science	**5**	**2**
7	Mathematical Calculations for Science	**5**	**3**
8	Using Statistics in Science	**5**	**3**
9	Informatics in Science	**5**	**3**
10	Using Science in the Workplace	**10**	**3**
11	Physiology of Human Body Systems	**10**	**3**
12	Physiology of Human Regulation and Reproduction	**10**	**3**
13	Biochemistry and Biochemical Techniques	**10**	**3**
15	Microbiological Techniques	**10**	**3**
16	Chemistry for Biology Technicians	**10**	**3**
18	Genetics and Genetic Engineering	**10**	**3**
24	Principles of Plant and Soil Science	**10**	**3**
29	Physiological Investigations	**10**	**3**
30	Medical Instrumentation	**10**	**3**
43	Diseases and Infections	**10**	**3**

Pearson BTEC Level 3 90-credit Diploma in Applied Science (Applied Chemistry)

The Pearson BTEC Level 3 90-credit Diploma in Applied Science (Applied Chemistry) has 90 credits and has 540 guided learning hours. It consists of **four** mandatory units **plus** optional units that provide for a combined total of 90 credits (where at least 85 credits must be at level 3 or above).

The units for the BTEC qualifications in this specification are available on our website (qualifications.pearson.com).

Pearson BTEC Level 3 90-credit Diploma in Applied Science (Applied Chemistry)			
Unit	**Mandatory units**	**Credit**	**Level**
1	Fundamentals of Science	**10**	**3**
2	Working in the Science Industry	**10**	**3**
3	Scientific Investigations	**10**	**3**
4	Scientific Practical Techniques	**10**	**3**
	Optional units		
5	Perceptions of Science	**10**	**3**
6	Using Mathematical Tools in Science	**5**	**2**
7	Mathematical Calculations for Science	**5**	**3**
8	Using Statistics in Science	**5**	**3**
9	Informatics in Science	**5**	**3**
10	Using Science in the Workplace	**10**	**3**
13	Biochemistry and Biochemical Techniques	**10**	**3**
19	Practical Chemical Analysis	**10**	**3**
22	Chemical Laboratory Techniques	**10**	**3**
26	Industrial Chemical Reactions	**10**	**3**
27	Chemical Periodicity and Its Applications	**10**	**3**
28	Industrial Applications of Organic Chemistry	**10**	**3**

Pearson BTEC Level 3 90-credit Diploma in Applied Science (Applied Physics)

The Pearson BTEC Level 3 90-credit Diploma in Applied Science (Applied Physics) has 90 credits and has 540 guided learning hours. It consists of **four** mandatory units **plus** optional units that provide for a combined total of 90 credits (where at least 85 credits must be at level 3 or above).

The units for the BTEC qualifications in this specification are available on our website (qualifications.pearson.com).

Pearson BTEC Level 3 90-credit Diploma in Applied Science (Applied Physics)			
Unit	**Mandatory units**	**Credit**	**Level**
1	Fundamentals of Science	**10**	**3**
2	Working in the Science Industry	**10**	**3**
3	Scientific Investigations	**10**	**3**
4	Scientific Practical Techniques	**10**	**3**
	Optional units		
5	Perceptions of Science	**10**	**3**
6	Using Mathematical Tools in Science	**5**	**2**
7	Mathematical Calculations for Science	**5**	**3**
8	Using Statistics in Science	**5**	**3**
9	Informatics in Science	**5**	**3**
10	Using Science in the Workplace	**10**	**3**
14	Energy Changes, Sources and Applications	**10**	**3**
17	Electrical Circuits and their Applications	**10**	**3**
20	Medical Physics Techniques	**10**	**3**
25	Electronics for Science Technicians	**10**	**3**
44	Astronomy	**10**	**3**

Pearson BTEC Level 3 90-credit Diploma in Applied Science (Medical Science)

The Pearson BTEC Level 3 90-credit Diploma in Applied Science (Medical Science) has 90 credits and has 540 guided learning hours. It consists of **four** mandatory units **plus** optional units that provide for a combined total of 90 credits (where at least 85 credits must be at level 3 or above).

The units for the BTEC qualifications in this specification are available on our website (qualifications.pearson.com).

Pearson BTEC Level 3 90-credit Diploma in Applied Science (Medical Science)			
Unit	**Mandatory units**	**Credit**	**Level**
1	Fundamentals of Science	**10**	**3**
2	Working in the Science Industry	**10**	**3**
3	Scientific Investigations	**10**	**3**
4	Scientific Practical Techniques	**10**	**3**
	Optional units		
5	Perceptions of Science	**10**	**3**
6	Using Mathematical Tools in Science	**5**	**2**
7	Mathematical Calculations for Science	**5**	**3**
8	Using Statistics in Science	**5**	**3**
9	Informatics in Science	**5**	**3**
10	Using Science in the Workplace	**10**	**3**
11	Physiology of Human Body Systems	**10**	**3**
12	Physiology of Human Regulation and Reproduction	**10**	**3**
13	Biochemistry and Biochemical Techniques	**10**	**3**
14	Energy Changes, Sources and Applications	**10**	**3**
15	Microbiological Techniques	**10**	**3**
16	Chemistry for Biology Technicians	**10**	**3**
17	Electrical Circuits and their Applications	**10**	**3**
18	Genetics and Genetic Engineering	**10**	**3**
19	Practical Chemical Analysis	**10**	**3**
20	Medical Physics Techniques	**10**	**3**
21	Biomedical Science Techniques	**10**	**3**
22	Chemical Laboratory Techniques	**10**	**3**
25	Electronics for Science Technicians	**10**	**3**
29	Physiological Investigations	**10**	**3**
30	Medical Instrumentation	**10**	**3**
41	Clinical Psychology	**10**	**3**
43	Diseases and Infections	**10**	**3**

Pearson BTEC Level 3 90-credit Diploma in Applied Science (Forensic Science)

The Pearson BTEC Level 3 90-credit Diploma in Applied Science (Forensic Science) has 90 credits and has 540 guided learning hours. It consists of **four** mandatory units **plus** optional units that provide for a combined total of 90 credits (where at least 85 credits must be at level 3 or above).

The units for the BTEC qualifications in this specification are available on our website (qualifications.pearson.com).

Pearson BTEC Level 3 90-credit Diploma in Applied Science (Forensic Science)			
Unit	**Mandatory units**	**Credit**	**Level**
1	Fundamentals of Science	**10**	**3**
2	Working in the Science Industry	**10**	**3**
3	Scientific Investigations	**10**	**3**
4	Scientific Practical Techniques	**10**	**3**
	Optional units		
5	Perceptions of Science	**10**	**3**
6	Using Mathematical Tools in Science	**5**	**2**
7	Mathematical Calculations for Science	**5**	**3**
8	Using Statistics in Science	**5**	**3**
9	Informatics in Science	**5**	**3**
10	Using Science in the Workplace	**10**	**3**
11	Physiology of Human Body Systems	**10**	**3**
12	Physiology of Human Regulation and Reproduction	**10**	**3**
15	Microbiological Techniques	**10**	**3**
16	Chemistry for Biology Technicians	**10**	**3**
18	Genetics and Genetic Engineering	**10**	**3**
19	Practical Chemical Analysis	**10**	**3**
20	Medical Physics Techniques	**10**	**3**
22	Chemical Laboratory Techniques	**10**	**3**
31	Criminology	**10**	**3**
32	Forensic Evidence Collection and Analysis	**10**	**3**
33	Forensic Photography	**10**	**3**
34	Criminal Psychology	**10**	**3**
35	Applications of Forensic Psychology	**10**	**3**
36	Forensic Fire Investigation	**10**	**3**
37	Forensic Science Informatics	**10**	**3**
38	Traffic Accident Investigation	**10**	**3**
39	Criminal Investigation Procedures	**10**	**3**
40	Criminal Investigation in Practice	**10**	**3**

Pearson BTEC Level 3 Diploma in Applied Science

The Pearson BTEC Level 3 Diploma in Applied Science has 120 credits and has 720 guided learning hours. It consists of **six** mandatory units **plus** optional units that provide for a combined total of 120 credits (where at least 90 credits must be at level 3 or above).

The units for the BTEC qualifications in this specification are available on our website (qualifications.pearson.com).

Pearson BTEC Level 3 Diploma in Applied Science			
Unit	**Mandatory units**	**Credit**	**Level**
1	Fundamentals of Science	**10**	**3**
2	Working in the Science Industry	**10**	**3**
3	Scientific Investigations	**10**	**3**
4	Scientific Practical Techniques	**10**	**3**
5	Perceptions of Science	**10**	**3**
6	Using Mathematical Tools in Science	**5**	**2**
	Optional units		
7	Mathematical Calculations for Science	**5**	**3**
8	Using Statistics in Science	**5**	**3**
9	Informatics in Science	**5**	**3**
10	Using Science in the Workplace	**10**	**3**
11	Physiology of Human Body Systems	**10**	**3**
12	Physiology of Human Regulation and Reproduction	**10**	**3**
13	Biochemistry and Biochemical Techniques	**10**	**3**
14	Energy Changes, Sources and Applications	**10**	**3**
15	Microbiological Techniques	**10**	**3**
16	Chemistry for Biology Technicians	**10**	**3**
17	Electrical Circuits and their Applications	**10**	**3**
18	Genetics and Genetic Engineering	**10**	**3**
19	Practical Chemical Analysis	**10**	**3**
20	Medical Physics Techniques	**10**	**3**
22	Chemical Laboratory Techniques	**10**	**3**
23	Science for Environmental Technicians	**10**	**3**
24	Principles of Plant and Soil Science	**10**	**3**
26	Industrial Applications of Chemical Reactions	**10**	**3**
27	Chemical Periodicity and Its Applications	**10**	**3**
28	Industrial Applications of Organic Chemistry	**10**	**3**
41	Clinical Psychology	**10**	**3**
42	Geology of Natural Resources	**10**	**3**
43	Diseases and Infections	**10**	**3**
44	Astronomy	**10**	**3**
45	Basic Polymer Technology	**10**	**3**
46	Plastics Materials	**10**	**3**
47	Plastics Processing	**10**	**3**

Pearson BTEC Level 3 Diploma in Applied Science			
Unit	**Optional units** *(continued)*	**Credit**	**Level**
48	Polymer Process Engineering	**10**	**3**
49	Rubber Products and Specialist Elastomers	**10**	**3**
50	Rubber Technology	**10**	**3**
51	Mechanical and Thermal Treatment of Metals	**10**	**3**
52	Structure and Properties of Metals	**10**	**3**
53	Extraction and Refining of Metals	**10**	**3**

Pearson BTEC Level 3 Diploma in Applied Science (Medical Science)

The Pearson BTEC Level 3 Diploma in Applied Science (Medical Science) has 120 credits and has 720 guided learning hours. It consists of **six** mandatory units **plus** optional units that provide for a combined total of 120 credits (where at least 90 credits must be at level 3 or above).

The units for the BTEC qualifications in this specification are available on our website (qualifications.pearson.com).

Pearson BTEC Level 3 Diploma in Applied Science (Medical Science)			
Unit	**Mandatory units**	**Credit**	**Level**
1	Fundamentals of Science	**10**	**3**
2	Working in the Science Industry	**10**	**3**
3	Scientific Investigations	**10**	**3**
4	Scientific Practical Techniques	**10**	**3**
5	Perceptions of Science	**10**	**3**
6	Using Mathematical Tools in Science	**5**	**2**
	Optional units		
7	Mathematical Calculations for Science	**5**	**3**
8	Using Statistics in Science	**5**	**3**
9	Informatics in Science	**5**	**3**
10	Using Science in the Workplace	**10**	**3**
11	Physiology of Human Body Systems	**10**	**3**
12	Physiology of Human Regulation and Reproduction	**10**	**3**
13	Biochemistry and Biochemical Techniques	**10**	**3**
15	Microbiological Techniques	**10**	**3**
17	Electrical Circuits and their Applications	**10**	**3**
18	Genetics and Genetic Engineering	**10**	**3**
20	Medical Physics Techniques	**10**	**3**
21	Biomedical Science Techniques	**10**	**3**
25	Electronics for Science Technicians	**10**	**3**
29	Physiological Investigations	**10**	**3**
30	Medical Instrumentation	**10**	**3**
41	Clinical Psychology	**10**	**3**
43	Diseases and Infections	**10**	**3**

Pearson BTEC Level 3 Diploma in Applied Science (Forensic Science)

The Pearson BTEC Level 3 Diploma in Applied Science (Forensic Science) has 120 credits and has 720 guided learning hours. It consists of **six** mandatory units **plus** optional units that provide for a combined total of 120 credits (where at least 90 credits must be at level 3 or above).

The units for the BTEC qualifications in this specification are available on our website (qualifications.pearson.com).

Pearson BTEC Level 3 Diploma in Applied Science (Forensic Science)			
Unit	**Mandatory units**	**Credit**	**Level**
1	Fundamentals of Science	**10**	**3**
2	Working in the Science Industry	**10**	**3**
3	Scientific Investigations	**10**	**3**
4	Scientific Practical Techniques	**10**	**3**
5	Perceptions of Science	**10**	**3**
6	Using Mathematical Tools in Science	**5**	**2**
	Optional units		
7	Mathematical Calculations for Science	**5**	**3**
10	Using Science in the Workplace	**10**	**3**
18	Genetics and Genetic Engineering	**10**	**3**
20	Medical Physics Techniques	**10**	**3**
22	Chemical Laboratory Techniques	**10**	**3**
31	Criminology	**10**	**3**
32	Forensic Evidence Collection and Analysis	**10**	**3**
33	Forensic Photography	**10**	**3**
34	Criminal Psychology	**10**	**3**
35	Applications of Forensic Psychology	**10**	**3**
36	Forensic Fire Investigation	**10**	**3**
37	Forensic Science Informatics	**10**	**3**
38	Traffic Accident Investigation	**10**	**3**
31	Criminal Investigation Procedures	**10**	**3**
40	Traffic Investigation in Practice	**10**	**3**

Pearson BTEC Level 3 Extended Diploma in Applied Science

The Pearson BTEC Level 3 Extended Diploma in Applied Science has 180 credits and has 1080 guided learning hours. It consists of **six** mandatory units **plus** optional units that provide for a combined total of 180 credits (where at least 135 credits must be at level 3 or above).

The units for the BTEC qualifications in this specification are available on our website (qualifications.pearson.com).

Pearson BTEC Level 3 Extended Diploma in Applied Science			
Unit	**Mandatory units**	**Credit**	**Level**
1	Fundamentals of Science	**10**	**3**
2	Working in the Science Industry	**10**	**3**
3	Scientific Investigations	**10**	**3**
4	Scientific Practical Techniques	**10**	**3**
5	Perceptions of Science	**10**	**3**
6	Using Mathematical Tools in Science	**5**	**2**
	Optional units		
7	Mathematical Calculations for Science	**5**	**3**
8	Using Statistics in Science	**5**	**3**
9	Informatics in Science	**5**	**3**
10	Using Science in the Workplace	**10**	**3**
11	Physiology of Human Body Systems	**10**	**3**
12	Physiology of Human Regulation and Reproduction	**10**	**3**
13	Biochemistry and Biochemical Techniques	**10**	**3**
14	Energy Changes, Sources and Applications	**10**	**3**
15	Microbiological Techniques	**10**	**3**
16	Chemistry for Biology Technicians	**10**	**3**
17	Electrical Circuits and their Applications	**10**	**3**
18	Genetics and Genetic Engineering	**10**	**3**
19	Practical Chemical Analysis	**10**	**3**
20	Medical Physics Techniques	**10**	**3**
21	Biomedical Science Techniques	**10**	**3**
22	Chemical Laboratory Techniques	**10**	**3**
23	Science for Environmental Technicians	**10**	**3**
24	Principles of Plant and Soil Science	**10**	**3**
25	Electronics for Science Technicians	**10**	**3**
26	Industrial Chemical Reactions	**10**	**3**
27	Chemical Periodicity and Its Applications	**10**	**3**
28	Industrial Applications of Organic Chemistry	**10**	**3**
41	Clinical Psychology	**10**	**3**
42	Geology of Natural Resources	**10**	**3**
43	Diseases and Infections	**10**	**3**
44	Astronomy	**10**	**3**
45	Basic Polymer Technology	**10**	**3**

Pearson BTEC Level 3 Extended Diploma in Applied Science			
Unit	**Optional units** *(continued)*	**Credit**	**Level**
46	Plastics Materials	**10**	**3**
47	Plastics Processing	**10**	**3**
48	Polymer Process Engineering	**10**	**3**
49	Rubber Products and Specialist Elastomers	**10**	**3**
50	Rubber Technology	**10**	**3**
51	Mechanical and Thermal Treatment of Metals	**10**	**3**
52	Structure and Properties of Metals	**10**	**3**
53	Extraction and Refining of Metals	**10**	**3**

Pearson BTEC Level 3 Extended Diploma in Applied Science (Medical Science)

The Pearson BTEC Level 3 Extended Diploma in Applied Science (Medical Science) has 80 credits and 1080 guided learning hours. It consists of **six** mandatory units **plus** optional units that provide for a combined total of 180 credits (where at least 135 credits must be at level 3 or above).

The units for the BTEC qualifications in this specification are available on our website (qualifications.pearson.com).

Pearson BTEC Level 3 Extended Diploma in Applied Science (Medical Science)			
Unit	**Mandatory units**	**Credit**	**Level**
1	Fundamentals of Science	**10**	**3**
2	Working in the Science Industry	**10**	**3**
3	Scientific Investigations	**10**	**3**
4	Scientific Practical Techniques	**10**	**3**
5	Perceptions of Science	**10**	**3**
6	Using Mathematical Tools in Science	**5**	**2**
	Optional units		
7	Mathematical Calculations for Science	**5**	**3**
8	Using Statistics in Science	**5**	**3**
9	Informatics in Science	**5**	**3**
10	Using Science in the Workplace	**10**	**3**
11	Physiology of Human Body Systems	**10**	**3**
12	Physiology of Human Regulation and Reproduction	**10**	**3**
13	Biochemistry and Biochemical Techniques	**10**	**3**
14	Energy Changes, Sources and Applications	**10**	**3**
15	Microbiological Techniques	**10**	**3**
16	Chemistry for Biology Technicians	**10**	**3**
17	Electrical Circuits and their Applications	**10**	**3**
18	Genetics and Genetic Engineering	**10**	**3**
19	Practical Chemical Analysis	**10**	**3**
20	Medical Physics Techniques	**10**	**3**
21	Biomedical Science Techniques	**10**	**3**
22	Chemical Laboratory Techniques	**10**	**3**
25	Electronics for Science Technicians	**10**	**3**
29	Physiological Investigations	**10**	**3**
30	Medical Instrumentation	**10**	**3**
41	Clinical Psychology	**10**	**3**
43	Diseases and Infections	**10**	**3**

Note: Unit 44: Astronomy was previously included in published qualification structures. Centres that have included this unit prior to June 2016 should advise Pearson.

Pearson BTEC Level 3 Extended Diploma in Applied Science (Forensic Science)

The Pearson BTEC Level 3 Extended Diploma in Applied Science (Forensic Science) has 180 credits and has 1080 guided learning hours. It consists of **six** mandatory units **plus** optional units that provide for a combined total of 180 credits (where at least 135 credits must be at level 3 or above).

The units for the BTEC qualifications in this specification are available on our website (qualifications.pearson.com).

Pearson BTEC Level 3 Extended Diploma in Applied Science (Forensic Science)			
Unit	**Mandatory units**	**Credit**	**Level**
1	Fundamentals of Science	**10**	**3**
2	Working in the Science Industry	**10**	**3**
3	Scientific Investigations	**10**	**3**
4	Scientific Practical Techniques	**10**	**3**
5	Perceptions of Science	**10**	**3**
6	Using Mathematical Tools in Science	**5**	**2**
	Optional units		
7	Mathematical Calculations for Science	**5**	**3**
8	Using Statistics in Science	**5**	**3**
9	Informatics in Science	**5**	**3**
10	Using Science in the Workplace	**10**	**3**
11	Physiology of Human Body Systems	**10**	**3**
12	Physiology of Human Regulation and Reproduction	**10**	**3**
15	Microbiological Techniques	**10**	**3**
16	Chemistry for Biology Technicians	**10**	**3**
18	Genetics and Genetic Engineering	**10**	**3**
19	Practical Chemical Analysis	**10**	**3**
20	Medical Physics Techniques	**10**	**3**
22	Chemical Laboratory Techniques	**10**	**3**
31	Criminology	**10**	**3**
32	Forensic Evidence Collection and Analysis	**10**	**3**
33	Forensic Photography	**10**	**3**
34	Criminal Psychology	**10**	**3**
35	Applications of Forensic Psychology	**10**	**3**
36	Forensic Fire Investigation	**10**	**3**
37	Forensic Science Informatics	**10**	**3**
38	Traffic Accident Investigation	**10**	**3**
39	Criminal Investigation Procedures	**10**	**3**
40	Criminal Investigation in Practice	**10**	**3**

Assessment and grading

All units are internally assessed in the BTEC qualifications in this specification.

All assessment for the BTEC qualifications in this specification is criterion referenced, based on the achievement of specified learning outcomes. Each unit within the qualification has specified assessment and grading criteria which are to be used for grading purposes. A summative unit grade can be awarded at pass, merit or distinction:

- to achieve a 'pass' a learner must have satisfied **all** the pass assessment criteria
- to achieve a 'merit' a learner must additionally have satisfied **all** the merit grading criteria
- to achieve a 'distinction' a learner must additionally have satisfied **all** the distinction grading criteria.

Learners who complete the unit but who do not meet all the pass criteria are graded 'unclassified'.

Grading domains

The grading criteria are developed in relation to grading domains which are exemplified by a number of indicative characteristics at the level of the qualification.

There are four BTEC grading domains:

- application of knowledge and understanding
- development of practical and technical skills
- personal development for occupational roles
- application of generic skills.

Please refer to *Annexe B* which shows the merit and distinction indicative characteristics.

Guidance

The purpose of assessment is to ensure that effective learning has taken place to give learners the opportunity to:

- meet the assessment and grading criteria and
- achieve the learning outcomes within the units.

All the assignments created by centres should be reliable and fit for purpose, and should build on the assessment and grading criteria. Assessment tasks and activities should enable learners to produce valid, sufficient and reliable evidence that relates directly to the specified criteria. Centres should enable learners to produce evidence in a variety of different forms and including, written reports, graphs and posters, along with projects, performance observation and time-constrained assessments.

Centres are encouraged to emphasise the practical application of the assessment and grading criteria, providing a realistic scenario for learners to adopt, and making maximum use of practical activities and work experience. The creation of assignments that are fit for purpose is vital to achievement and their importance cannot be over-emphasised.

The assessment and grading criteria must be clearly indicated in the fit-for-purpose assignments. This gives learners focus and helps with internal verification and standardisation processes. It will also help to ensure that learner feedback is specific to the assessment and grading criteria.

When looking at the assessment and grading grids and designing assignments, centres are encouraged to identify common topics and themes.

The units include guidance on appropriate assessment methodology. A central feature of vocational assessment is that it allows for assessment to be:

- current, ie to reflect the most recent developments and issues
- local, ie to reflect the employment context of the delivering centre
- flexible to reflect learner needs, ie at a time and in a way that matches the learner's requirements so that they can demonstrate achievement.

Calculation of the qualification grade

Pass qualification grade

Learners who achieve the minimum eligible credit value specified by the rule of combination will achieve the qualification at pass grade (see *Rules of combination for Pearson BTEC Level 3 qualifications in this specification*).

Qualification grades above pass grade

Learners will be awarded a merit or distinction or distinction* qualification grade (or combination of these grades appropriate to the qualification) by the aggregation of points gained through the successful achievement of individual units. The number of points available is dependent on the unit level and grade achieved, and the credit size of the unit (as shown in the *points available for credits achieved at different levels and unit grades* below).

Points available for credits achieved at different Levels and unit grades

The table below shows the **number of points scored per credit** at the unit level and grade.

Unit level	Points per credit		
	Pass	Merit	Distinction
Level 2	5	6	7
Level 3	**7**	**8**	**9**
Level 4	9	10	11

Learners who achieve the correct number of points within the ranges shown in the 'qualification grade' table will achieve the qualification merit or distinction or distinction* grade (or combinations of these grades appropriate to the qualification).

Qualification grade

BTEC Level 3 Certificate

Points range above pass grade	Grade	
230-249	Merit	M
250-259	Distinction	D
260 and above	Distinction*	D*

BTEC Level 3 Subsidiary Diploma

Points range above pass grade	Grade	
460-499	Merit	M
500-519	Distinction	D
520 and above	Distinction*	D*

BTEC Level 3 90-credit Diploma

Points range above pass grade	Grade
660-689	MP
690–719	MM
720-749	DM
750–769	DD
770-789	D*D
790 and above	D*D*

BTEC Level 3 Diploma

Points range above pass grade	Grade
880-919	MP
920-959	MM
960-999	DM
1000-1029	DD
1030-1059	D*D
1060 and above	D*D*

BTEC Level 3 Extended Diploma

Points range above pass grade	Grade
1300-1339	MPP
1340-1379	MMP
1380-1419	MMM
1420-1459	DMM
1460-1499	DDM
1500-1529	DDD
1530-1559	D*DD
1560-1589	D*D*D
1590 and above	D*D*D*

Please refer to *Annexe G* for examples of calculation of qualification grade above pass grade.

Quality assurance of centres

Pearson's qualification specifications set out the standard to be achieved by each learner in order for them to gain the qualification. This is done throughout the learning outcomes, and assessment and grading criteria in each unit. Further guidance on delivery and assessment is given in the *Essential guidance for tutors* section in each unit. This section is designed to provide guidance related to the unit to support tutors, deliverers and assessors and to provide coherence of understanding and consistency of delivery and assessment.

Approval

Centres that have not previously offered BTEC qualifications will first need to apply for, and be granted, centre approval before they can apply for approval to offer the programme.

When a centre applies for approval to offer a BTEC qualification they are required to enter into an approvals agreement.

The approvals agreement is a formal commitment by the head or principal of a centre to meet all the requirements of the specification and any linked codes or regulations. Sanctions and tariffs may be applied if centres do not comply with the agreement. Ultimately, this could result in the suspension of certification or withdrawal of approval.

Centres will be allowed 'accelerated approval' for a new programme where the centre already has approval for a programme that is being replaced by the new programme.

The key principles of quality assurance are that:

- a centre delivering BTEC programmes must be an approved centre and must have approval for programmes, or groups of programmes, that it is operating
- the centre agrees, as part of gaining approval, to abide by specific terms and conditions around the effective delivery and quality assurance of assessment; it must abide by these conditions throughout the period of delivery
- Pearson makes available to approved centres a range of materials and opportunities intended to exemplify the processes required for effective assessment and examples of effective standards. Approved centres must use the materials and services to ensure that all staff delivering BTEC qualifications keep up to date with the guidance on assessment
- an approved centre must follow agreed protocols for standardisation of assessors and verifiers; planning, monitoring and recording of assessment processes; and for dealing with special circumstances, appeals and malpractice.

The approach of quality assured assessment is made through a partnership between an approved centre and Pearson. Pearson is committed to ensuring that it follows best practice and employs appropriate technology to support quality assurance processes where practicable. Therefore, the specific arrangements for working with centres will vary. Pearson seeks to ensure that the quality assurance processes that it uses do not place undue bureaucratic processes on centres and works to support centres in providing robust quality assurance processes.

Pearson monitors and supports centres in the effective operation of assessment and quality assurance. The methods which it uses to do this for BTEC programmes include these:

- ensuring that all centres have completed appropriate declarations at the time of approval, undertaking approval visits to centres where necessary
- requiring all centres to appoint a Lead Internal Verifier for designated groups of programmes and to ensure that this person is trained and supported in carrying out that role
- requiring that the Lead Internal Verifier completes compulsory online standardisation related to assessment and verification decisions for the designated programme
- assessment sampling and verification, through requested samples of assessments, completed assessed learner work and associated documentation
- overarching review and assessment of a centre's strategy for assessing and quality assuring its BTEC programmes.

Edexcel Quality Assurance Handbook

Centres should refer to the *UK BTEC Quality Assurance Handbook*, issued annually, for detailed guidance.

An approved centre must make certification claims only when authorised by Pearson and strictly in accordance with requirements for reporting.

Centres that do not fully address and maintain rigorous approaches to quality assurance will be prevented from seeking certification for individual programmes or for all BTEC programmes. Centres that do not comply with remedial action plans may have their approval to deliver qualifications removed.

Programme design and delivery

The BTEC qualifications in this specification consist of mandatory units and optional units. Optional units are designed to provide a focus to the qualification and more specialist opportunities in the sector.

In BTEC qualifications each unit has a number of guided learning hours and centres are advised to take this into account when planning the programme of study associated with this specification.

Mode of delivery

Pearson does not define the mode of study for the BTEC qualifications in this specification. Centres are free to offer the qualifications using any mode of delivery (such as full time, part time, evening only, distance learning) that meets their learners' needs. Whichever mode of delivery is used, centres must ensure that learners have appropriate access to the resources identified in the specification and to the subject specialists delivering the units. This is particularly important for learners studying for the qualification through open or distance learning.

Learners studying for the qualification on a part-time basis bring with them a wealth of experience that should be utilised to maximum effect by tutors and assessors. The use of assessment evidence drawn from learners' work environments should be encouraged. Those planning the programme should aim to enhance the vocational nature of the qualification by:

- liaising with employers to ensure a course relevant to learners' specific needs
- accessing and using non-confidential data and documents from learners' workplaces
- including sponsoring employers in the delivery of the programme and, where appropriate, in the assessment
- linking with company-based/workplace training programmes
- making full use of the variety of experience of work and life that learners bring to the programme.

Resources

The BTEC qualifications in this specification are designed to prepare learners for employment in specific occupational sectors. Physical resources need to support the delivery of the programme and the proper assessment of the learning outcomes and should, therefore, normally be of industry standard. Staff delivering programmes and conducting the assessments should be familiar with current practice and standards in the sector concerned. Centres will need to meet any specific resource requirements to gain approval from Pearson.

Where specific resources are required these have been indicated in individual units in the *Essential resources* sections.

Delivery approach

It is important that centres develop an approach to teaching and learning that supports the specialist vocational nature of BTEC qualifications and the mode of delivery. Specifications give a balance of practical skill development and knowledge requirements, some of which can be theoretical in nature. Tutors and assessors need to ensure that appropriate links are made between theory and practical application and that the knowledge base is applied to the sector. This requires the development of relevant and up-to-date teaching materials that allow learners to apply their learning to actual events and activity within the sector. Maximum use should be made of the learner's experience.

An outline learning plan is included in every unit as guidance to demonstrate one way of planning the delivery and assessment of the unit. The outline learning plan can be used in conjunction with the programme of suggested assignments.

Where the qualification has been designated and approved as a Technical Certificate and forms part of an Apprenticeship scheme, particular care needs to be taken to build strong links between the learning and assessment for the BTEC qualification and the related NVQs and Functional Skills that also contribute to the scheme.

Meeting local needs

Centres should note that the qualifications set out in this specification have been developed in consultation with centres and employers and the Sector Skills Councils or the Standards Setting Bodies for the relevant sector. Centres should make maximum use of the choice available to them within the optional units to meet the needs of their learners, and local skills and training needs.

In certain circumstances, units in this specification might not allow centres to meet a local need. In this situation, Pearson will ensure that the rule of combination allows centres to make use of units from other BTEC specifications in this suite. Centres are required to ensure that the coherence and purpose of the qualification is retained and to ensure that the vocational focus is not diluted.

For information about limitations on variations from standard specifications, see *Rules of combination for Pearson BTEC Level 3 qualifications in this specification*.

These units cannot be used at the expense of the mandatory units in any qualification.

Additional and specialist learning

Additional and specialist learning (ASL) consists of accredited qualifications. The ASL may include BTEC qualifications which are also available to learners not following a Diploma course of study.

Qualifications that are valid against different lines of principal learning can be identified on the Register of Regulated Qualifications.

Functional skills

The BTEC qualifications in this specification give learners opportunities to develop and apply Functional Skills.

Functional Skills are offered as stand-alone qualifications at level 2. See individual units for opportunities to cover ICT, Mathematics and English Functional Skills.

Personal, learning and thinking skills

Opportunities are available to develop personal, learning and thinking skills (PLTS) within sector-related context. PLTS are identified in brackets after the unit pass criteria to which they are associated and they are also mapped in *Annexe C*. Further opportunities for learners to demonstrate these skills may arise as learners progress throughout their learning.

Access and recruitment

Edexcel's policy regarding access to its qualifications is that:

- they should be available to everyone who is capable of reaching the required standards
- they should be free from any barriers that restrict access and progression
- there should be equal opportunities for all wishing to access the qualifications.

Centres are required to recruit learners to BTEC qualifications with integrity. This will include ensuring that applicants have appropriate information and advice about the qualification and that the qualification will meet their needs. Centres should take appropriate steps to assess each applicant's potential and make a professional judgement about their ability to successfully complete the programme of study and achieve the qualification. This assessment will need to take account of the support available to the learner within the centre during their programme of study and any specific support that might be necessary to allow the learner to access the assessment for the qualification. Centres should consult Pearson's policy on learners with particular requirements.

Centres will need to review the entry profile of qualifications and/or experience held by applicants, considering whether this profile shows an ability to progress to a level 3 qualification. For learners who have recently been in education, the profile is likely to include one of the following:

- a BTEC level 2 qualification in Applied Science or a related vocational area
- a standard of literacy and numeracy supported by a general education equivalent to four GCSEs at grade A*-C
- other related level 2 qualifications
- related work experience.

More mature learners may present a more varied profile of achievement that is likely to include experience of paid and/or unpaid employment.

Restrictions on learner entry

Most BTEC qualifications are for learners aged 16 years and over.

In particular sectors the restrictions on learner entry might also relate to any physical or legal barriers, for example people working in health, care or education are likely to be subject to Criminal Records Bureau (CRB) checks.

Access arrangements for learners with disabilities and specific needs

Equality and fairness are central to our work. Pearson's Equality Policy requires that all learners should have equal opportunity to access our qualifications and assessments, and that our qualifications should be awarded in a way that is fair to every learner.

We are committed to ensuring that:

- learners with a protected characteristic (as defined by the Equality Act 2010) are not, when they are undertaking one of our qualifications, disadvantaged in comparison to learners who do not share that characteristic

- all learners achieve the recognition they deserve from undertaking a qualification and that this achievement can be fairly compared to the achievement of their peers.

Details on how to make adjustments for learners with protected characteristics are given in the policy document *Reasonable Adjustment and Special Considerations for BTEC and Edexcel NVQ Qualifications*, which can be found on the Edexcel website.

Recognition of Prior Learning

Recognition of Prior Learning (RPL) is a method of assessment (leading to the award of credit) that considers whether a learner can demonstrate that they can meet the assessment requirements for a unit through knowledge, understanding or skills they already possess and so do not need to develop through a course of learning.

Pearson encourages centres to recognise learners' previous achievements and experiences whether at work, home or at leisure, as well as in the classroom. RPL provides a route for the recognition of the achievements resulting from continuous learning.

RPL enables recognition of achievement from a range of activities using any valid assessment methodology. Provided that the assessment requirements of a given unit or qualification have been met, the use of RPL is acceptable for accrediting a unit, units or a whole qualification. Evidence of learning must be valid and reliable.

Unit format

All units in BTEC level 3 qualifications have a standard format. The unit format is designed to give guidance on the requirements of the qualification for learners, tutors, assessors and those responsible for monitoring national standards.

Each unit has the following sections.

Unit title

The unit title will appear on the learner's Notification of Performance (NOP).

Level

All units and qualifications have a level assigned to them, which represents the level of achievement. There are nine levels of achievement, from Entry level to level 8. The level of the unit has been informed by the level descriptors and, where appropriate, the National Occupational Standards (NOS) and/or other sector/professional benchmarks.

Credit value

Each unit in BTEC qualifications has a credit value; learners will be awarded credits for the successful completion of whole units.

A credit value specifies the number of credits that will be awarded to a learner who has met all the learning outcomes of the unit.

Guided learning hours

Guided learning hours for the unit are defined on page 3.

Aim and purpose

The aim is a succinct statement that summarises the learning outcomes of the unit.

Unit introduction

The unit introduction gives the reader an appreciation of the unit in the vocational setting of the qualification, as well as highlighting the focus of the unit. It gives the reader a snapshot of the unit and the key knowledge, skills and understanding gained while studying the unit. The unit introduction also highlights any links to the appropriate vocational sector by describing how the unit relates to that sector.

Learning outcomes

Learning outcomes state exactly what a learner should 'know, understand or be able to do' as a result of completing the unit.

Unit content

The unit content identifies the breadth of knowledge, skills and understanding needed to design and deliver a programme of learning to achieve each of the learning outcomes. This is informed by the underpinning knowledge and understanding requirements of the related NOS. The content provides the range of subject material for the programme of learning and specifies the skills, knowledge and understanding required for achievement of the pass, merit and distinction grading criteria.

Each learning outcome is stated in full and then the key phrases or concepts related to that learning outcome are listed in italics followed by the subsequent range of related topics.

Relationship between content and assessment criteria

The learner must have the opportunity within delivery of the unit to cover all the unit content.

It is not a requirement of the unit specification that all content is assessed. However, the indicative content will need to be covered in a programme of learning in order for learners to be able to meet the standard determined in the assessment and grading criteria. The merit and distinction grading criteria enable the learner to achieve higher levels of performance in acquisition of knowledge, understanding and skills.

Content structure and terminology

The information below shows how unit content is structured and gives the terminology used to explain the different components within the content.

- Learning outcome: this is given in bold at the beginning of each section of content.
- Italicised sub-heading: it contains a key phrase or concept. This is content which must be covered in the delivery of the unit. Colons mark the end of an italicised sub-heading.
- Elements of content: the elements are in plain text and amplify the sub-heading. The elements must also be covered in the delivery of the unit. Semi-colons mark the end of an element.
- Brackets contain amplification of elements of content which must be covered in the delivery of the unit.
- 'eg' is a list of examples used for indicative amplification of an element (that is, the content specified in this amplification that could be covered or that could be replaced by other, similar material).

Assessment and grading grid

Each grading grid gives the assessment and grading criteria used to determine the evidence that each learner must produce in order to receive a pass, merit or distinction grade. It is important to note that the merit and distinction grading criteria require a qualitative improvement in a learner's evidence and not simply the production of more evidence at the same level.

Essential guidance for tutors

This section gives tutors additional guidance and amplification to aid understanding and a consistent level of delivery and assessment. It is divided into the following sections.

- *Delivery* – explains the content's relationship with the learning outcomes and offers guidance about possible approaches to delivery. This section is based on the more usual delivery modes but is not intended to rule out alternative approaches.
- *Outline learning plan* – the outline learning plan has been included in every unit as guidance and demonstrates one way in planning the delivery and assessment of a unit. The outline learning plan can be used in conjunction with the programme of suggested assignments.
- *Assessment* – gives amplification about the nature and type of evidence that learners need to produce in order to pass the unit or achieve the higher grades. This section should be read in conjunction with the grading criteria.
- *Suggested programme of assignments* – the table shows how the suggested assignments match and cover the assessment grading criteria.
- *Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications* – sets out links with other units within the qualification. These links can be used to ensure that learners make connections between units, resulting in a coherent programme of learning. The links show opportunities for integration of learning, delivery and assessment.
- *Essential resources* – identifies any specialist resources needed to allow learners to generate the evidence required for each unit. The centre will be asked to ensure that any requirements are in place when it seeks approval from Pearson to offer the qualification.
- *Employer engagement and vocational contexts* – provides a short list of agencies, networks and other useful contacts for employer engagement and for sources of vocational contexts.
- *Indicative reading for learners* – gives a list of resource materials for learners that benchmark the level of study.

Further information

For further information please call Customer Services on 020 7010 2188(calls may be recorded for quality and training purposes) or email TeachingScience@pearson.com.

Useful publications

Further copies of this document and related publications can be obtained from:

Telephone: 0845 172 0205

Email: publication.orders@pearson.com

Related information and publications include:

- Functional Skills publications – specifications, tutor support materials and question papers
- the current publications catalogue and update catalogue.

Pearson publications concerning the Quality Assurance System and the internal and external verification of vocationally related programmes can be found on the Pearson website and in the Pearson publications catalogue.

NB: Most of our publications are priced. There is also a charge for postage and packing. Please check the cost when you order.

How to obtain National Occupational Standards

Please contact:

Science, Engineering, Manufacturing Technologies Alliance (SEMTA)
14 Upton Road
Watford WD18 0JT

Telephone: 01923 238441
Fax: 01923 256086

Professional development and training

Pearson supports UK and international customers with training related to BTEC qualifications. This support is available through a choice of training options offered in our published training directory or through customised training at your centre.

The support we offer focuses on a range of issues including:

- planning for the delivery of a new programme
- planning for assessment and grading
- developing effective assignments
- building your team and teamwork skills
- developing student-centred learning and teaching approaches
- building Functional Skills into your programme
- building in effective and efficient quality assurance systems.

The national programme of training we offer can be viewed on our website (www.pearson.com/training). You can request customised training through the website or by contacting one of our advisers in the Training from Pearson UK to discuss your training needs.

Our customer service numbers are:

The training we provide:

- is active – ideas are developed and applied
- is designed to be supportive and thought provoking
- builds on best practice.

Annexe A

The Pearson BTEC qualification framework for the applied science sector

Progression opportunities within the framework.

<table>
<tr><th>Level</th><th colspan="2">General qualifications</th><th>BTEC full vocationally-related qualifications</th><th>BTEC Short Courses</th><th>NVQ/occupational</th></tr>
<tr><td>8</td><td colspan="2"></td><td></td><td></td><td></td></tr>
<tr><td>7</td><td colspan="2"></td><td></td><td></td><td></td></tr>
<tr><td>6</td><td colspan="2"></td><td></td><td></td><td></td></tr>
<tr><td>5</td><td colspan="2"></td><td rowspan="2">BTEC Higher Nationals in Applied Biology

BTEC Higher Nationals in Applied Chemistry</td><td></td><td></td></tr>
<tr><td>4</td><td colspan="2"></td><td></td><td>NVQ Laboratory and Associated Technical Activities</td></tr>
<tr><td>3</td><td colspan="2">GCE Sciences: Chemistry, Physics, Biology/Human Perspectives on Science; Psychology</td><td>Pearson BTEC Level 3 Certificate, Subsidiary Diploma, 90-credit Diploma, Diploma and Extended Diploma in Applied Science (including Forensic Science and Medical Science pathways)</td><td></td><td>NVQ Laboratory and Associated Technical Activities</td></tr>
<tr><td>2</td><td>GCSE Science; Additional Science; Astronomy; Chemistry; Physics; Biology; Psychology</td><td>GCSE Science</td><td>Pearson BTEC Level 2 Certificate, Extended Certificate and Diploma in Applied Science</td><td></td><td>NVQ Laboratory and Associated Technical Activities</td></tr>
<tr><td>1</td><td colspan="2"></td><td>Pearson BTEC Foundation Learning (Applied Science)</td><td></td><td></td></tr>
<tr><td>Entry</td><td colspan="2"></td><td>Pearson BTEC Foundation Learning (Applied Science)</td><td></td><td></td></tr>
</table>

Annexe B

Grading domains: BTEC level 3 generic grading domains

Grading domain 1	Indicative characteristics – merit	Indicative characteristics – distinction
Application of knowledge and understanding (Learning outcome stem *understand* or *know*)	• Shows depth of knowledge and development of understanding in familiar and unfamiliar situations (for example explain why, makes judgements based on analysis). • Applies and/or selects concepts showing comprehension of often complex theories. • Applies knowledge in often familiar and unfamiliar contexts. • Applies knowledge to non-routine contexts (eg assessor selection). • Makes reasoned analytical judgements. • Shows relationships between pass criteria.	• Synthesises knowledge and understanding across pass/merit criteria. • Evaluates complex concepts/ideas/ actions and makes reasoned and confident judgements. • Uses analysis, research and evaluation to make recommendations and influence proposals. • Analyses implications of application of knowledge/understanding. • Accesses and evaluates knowledge and understanding to advance complex activities/contexts. • Shows relationships with p/m criteria. • Responds positively to evaluation.
Grading domain 2	**Indicative characteristics – merit**	**Indicative characteristics – distinction**
Development of practical and technical skills (Learning outcome stem *be able to*)	• Deploys appropriate advanced techniques/processes/skills. • Applies technical skill to advance non-routine activities. • Advances practical activities within resource constraints. • Produces varied solutions (including non-routine). • Modifies techniques/processes to situations. • Shows relationship between p criteria.	• Demonstrates creativity/originality/own ideas. • Applies skill(s) to achieve higher order outcome. • Selects and uses successfully from a range of advanced techniques/ processes/skills. • Reflects on skill acquisition and application. • Justifies application of skills/methods. • Makes judgements about risks and limitations of techniques/processes. • Innovates or generates new techniques/ processes for new situations. • Shows relationship with p and m criteria.

Grading domain 3	Indicative characteristics – merit	Indicative characteristics – distinction
Personal development for occupational roles (Any learning outcome stem)	• Takes responsibility in planning and undertaking activities. • Reviews own development needs. • Finds and uses relevant information sources. • Acts within a given work-related context showing understanding of responsibilities. • Identifies responsibilities of employers to the community and the environment. • Applies qualities related to the vocational sector. • Internalises skills/attributes (creating confidence).	• Manages self to achieve outcomes successfully. • Plans for own learning and development through the activities. • Analyses and manipulates information to draw conclusions. • Applies initiative appropriately. • Assesses how different work-related contexts or constraints would change performance. • Reacts positively to changing work-related contexts • Operates ethically in work-related environments. • Takes decisions related to work contexts. • Applies divergent and lateral thinking in work-related contexts. • Understands interdependence.
Grading domain 4	**Indicative characteristics – merit**	**Indicative characteristics – distinction**
Application of generic skills (Any learning outcome stem)	• Communicates effectively using appropriate behavioural and language registers. • Communicates with clarity and influence. • Makes judgements in contexts with explanations. • Explains how to contribute within a team. • Demonstrates positive contribution to team(s). • Makes adjustments to meet the needs/ expectations of others (negotiation skills). • Selects and justifies solutions for specified problems.	• Presents self and communicates information to meet the needs of a variety of audience. • Identifies strategies for communication. • Shows innovative approaches to dealing with individuals and groups. • Takes decisions in contexts with justifications. • Produces outputs subject to time/ resource constraints. • Reflects on own contribution to working within a team. • Generates new or alternative solutions to specified problems. • Explores entrepreneurial attributes.

Annexe C

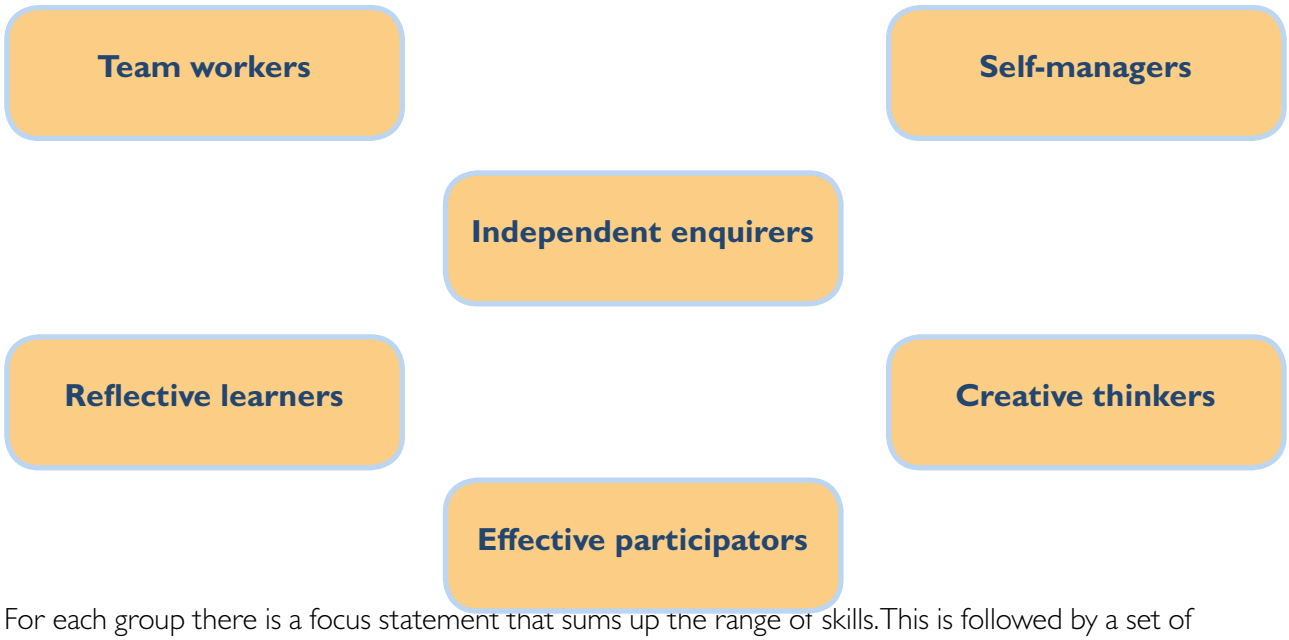
Personal, learning and thinking skills

A FRAMEWORK OF PERSONAL, LEARNING AND THINKING SKILLS 11–19 IN ENGLAND

Source – QCDA

The framework comprises six groups of skills that, together with the Functional Skills of English, Mathematics and ICT, are essential to success in learning, life and work. In essence the framework captures the essential skills of: managing self; managing relationships with others; and managing own learning, performance and work. It is these skills that will enable young people to enter work and adult life confident and capable.

The titles of the six groups of skills are set out below.



For each group there is a focus statement that sums up the range of skills. This is followed by a set of outcome statements that are indicative of the skills, behaviours and personal qualities associated with each group.

Each group is distinctive and coherent. The groups are also inter-connected. Young people are likely to encounter skills from several groups in any one learning experience. For example an independent enquirer would set goals for their research with clear success criteria (reflective learner) and organise and manage their time and resources effectively to achieve these (self-manager). In order to acquire and develop fundamental concepts such as organising oneself, managing change, taking responsibility and perseverance, learners will need to apply skills from all six groups in a wide range of learning contexts 11-19.

The Skills

Independent enquirers

Focus:

Young people process and evaluate information in their investigations, planning what to do and how to go about it. They take informed and well-reasoned decisions, recognising that others have different beliefs and attitudes.

Young people:

- identify questions to answer and problems to resolve
- plan and carry out research, appreciating the consequences of decisions
- explore issues, events or problems from different perspectives
- analyse and evaluate information, judging its relevance and value
- consider the influence of circumstances, beliefs and feelings on decisions and events
- support conclusions, using reasoned arguments and evidence.

Creative thinkers

Focus:

Young people think creatively by generating and exploring ideas, making original connections. They try different ways to tackle a problem, working with others to find imaginative solutions and outcomes that are of value.

Young people:

- generate ideas and explore possibilities
- ask questions to extend their thinking
- connect their own and others' ideas and experiences in inventive ways
- question their own and others' assumptions
- try out alternatives or new solutions and follow ideas through
- adapt ideas as circumstances change.

Reflective learners

Focus:

Young people evaluate their strengths and limitations, setting themselves realistic goals with criteria for success. They monitor their own performance and progress, inviting feedback from others and making changes to further their learning.

Young people:

- assess themselves and others, identifying opportunities and achievements
- set goals with success criteria for their development and work
- review progress, acting on the outcomes
- invite feedback and deal positively with praise, setbacks and criticism
- evaluate experiences and learning to inform future progress
- communicate their learning in relevant ways for different audiences.

Team workers

Focus:

Young people work confidently with others, adapting to different contexts and taking responsibility for their own part. They listen to and take account of different views. They form collaborative relationships, resolving issues to reach agreed outcomes.

Young people:

- collaborate with others to work towards common goals
- reach agreements, managing discussions to achieve results
- adapt behaviour to suit different roles and situations, including leadership role
- show fairness and consideration to others
- take responsibility, showing confidence in themselves and their contribution
- provide constructive support and feedback to others.

Self-managers

Focus:

Young people organise themselves, showing personal responsibility, initiative, creativity and enterprise with a commitment to learning and self-improvement. They actively embrace change, responding positively to new priorities, coping with challenges and looking for opportunities.

Young people:

- seek out challenges or new responsibilities and show flexibility when priorities change
- work towards goals, showing initiative, commitment and perseverance
- organise time and resources, prioritising actions
- anticipate, take and manage risks
- deal with competing pressures, including personal and work-related demands
- respond positively to change, seeking advice and support when needed.

Effective participators

Focus:

Young people actively engage with issues that affect them and those around them. They play a full part in the life of their school, college, workplace or wider community by taking responsible action to bring improvements for others as well as themselves.

Young people:

- discuss issues of concern, seeking resolution where needed
- present a persuasive case for action
- propose practical ways forward, breaking these down into manageable steps
- identify improvements that would benefit others as well as themselves
- try to influence others, negotiating and balancing diverse views to reach workable solutions
- act as an advocate for views and beliefs that may differ from their own.

PLTS performance indicator (suggested recording sheet)

Name:	Date:				
	Level of success 1 = low, 5 = high				
Independent enquirers					
Identify questions to answer and problems to resolve	1	2	3	4	5
Plan and carry out research, appreciating the consequences of decisions	1	2	3	4	5
Explore issues, events or problems from different perspectives	1	2	3	4	5
Analyse and evaluate information, judging its relevance and value	1	2	3	4	5
Consider the influence of circumstances, beliefs and feelings on decisions and events	1	2	3	4	5
Support conclusions, using reasoned arguments and evidence	1	2	3	4	5
Creative thinkers					
Generate ideas and explore possibilities	1	2	3	4	5
Ask questions to extend their thinking	1	2	3	4	5
Connect their own and others' ideas and experiences in inventive ways	1	2	3	4	5
Question their own and others' assumptions	1	2	3	4	5
Try out alternatives or new solutions and follow ideas through	1	2	3	4	5
Adapt ideas as circumstances change	1	2	3	4	5
Reflective learners					
Assess themselves and others, identifying opportunities and achievements	1	2	3	4	5
Set goals with success criteria for their development and work	1	2	3	4	5
Review progress, acting on the outcomes	1	2	3	4	5
Invite feedback and deal positively with praise, setbacks and criticism	1	2	3	4	5
Evaluate experiences and learning to inform future progress	1	2	3	4	5
Communicate their learning in relevant ways for different audiences	1	2	3	4	5

Team workers					
Collaborate with others to work towards common goals	1	2	3	4	5
Reach agreements, managing discussions to achieve results	1	2	3	4	5
Adapt behaviour to suit different roles and situations, including leadership roles	1	2	3	4	5
Show fairness and consideration to others	1	2	3	4	5
Take responsibility, showing confidence in themselves and their contribution	1	2	3	4	5
Provide constructive support and feedback to others	1	2	3	4	5
Self-managers					
Seek out challenges or new responsibilities and show flexibility when priorities change	1	2	3	4	5
Work towards goals, showing initiative, commitment and perseverance	1	2	3	4	5
Organise time and resources, prioritising actions	1	2	3	4	5
Anticipate, take and manage risks	1	2	3	4	5
Deal with competing pressures, including personal and work-related demands	1	2	3	4	5
Respond positively to change, seeking advice and support when needed	1	2	3	4	5
Effective participators					
Discuss issues of concern, seeking resolution where needed	1	2	3	4	5
Present a persuasive case for action	1	2	3	4	5
Propose practical ways forward, breaking these down into manageable steps	1	2	3	4	5
Identify improvements that would benefit others as well as themselves	1	2	3	4	5
Try to influence others, negotiating and balancing diverse views to reach workable solutions	1	2	3	4	5
Act as an advocate for views and beliefs that may differ from their own	1	2	3	4	5

Note to learner: The circled number represents an indication of your PLTS performance so far.

Note to tutor: Indicate the level of success by circling the appropriate number during your feedback with the learner.

Summary of the PLTS coverage throughout the programme

This table shows where units support the development of personal, learning and thinking skills.

Key

✓ indicates opportunities for development

a blank space indicates no opportunities for development

Personal, learning and thinking skills	Unit								
	1	2	3	4	5	6	7	8	9
Independent enquirers	✓	✓	✓	#	✓	✓	✓	✓	✓
Creative thinkers	#	✓	✓		#	✓	✓	✓	✓
Reflective learners	✓	✓	✓	#	✓	#	✓	✓	#
Team workers	#	✓	#	#	✓		#		#
Self-managers	✓	✓	✓	✓	✓	✓	✓	#	✓
Effective participators	✓	✓	#	✓	#	#	#	#	
✓ – assessed in the grading criteria									
# – opportunities for development									

Personal, learning and thinking skills	Unit								
	10	11	12	13	14	15	16	17	18
Independent enquirers	✓	✓	✓	✓	#	#	✓	✓	✓
Creative thinkers	✓	#	✓	✓	#	✓	✓	✓	✓
Reflective learners	✓	#	✓	#	#	✓	✓	✓	#
Team workers	✓	✓	✓	✓	✓	#	#	✓	✓
Self-managers	✓	#	✓	✓	✓	✓	#	✓	✓
Effective participators	✓	✓	✓	✓	✓		✓	✓	✓
✓ – assessed in the grading criteria									
# – opportunities for development									

Personal, learning and thinking skills	Unit								
	19	20	21	22	23	24	25	26	27
Independent enquirers	✓	✓	✓	#	✓	✓	✓		✓
Creative thinkers	#	#	✓	✓	✓	#	✓	✓	✓
Reflective learners	✓	#	✓	✓	#	✓	✓	✓	✓
Team workers	#	✓	✓	#	✓	✓	✓		
Self-managers	#	✓	✓	#	#	✓	✓		
Effective participators	✓		✓	✓	✓		✓	✓	✓
✓ – assessed in the grading criteria									
# – opportunities for development									

Personal, learning and thinking skills	Unit								
	28	29	30	31	32	33	34	35	36
Independent enquirers		✓	✓	✓	✓	✓	✓	✓	✓
Creative thinkers	✓	✓	#	✓		#	✓	✓	#
Reflective learners	✓	✓	#	✓			#	✓	
Team workers		✓	✓	✓	✓		#	#	✓
Self-managers	#	✓	✓	✓	#	✓	#	✓	
Effective participators	✓	✓		✓	✓	#	✓	#	#
✓ – assessed in the grading criteria									
# – opportunities for development									

Personal, learning and thinking skills	Unit							
	37	38	39	40	41	42	43	44
Independent enquirers	✓	✓	✓	✓		#	✓	✓
Creative thinkers	✓	#	✓	✓				✓
Reflective learners	#		✓	✓		#	#	✓
Team workers	#	✓	✓	✓		✓	#	✓
Self-managers	✓	✓	✓	✓		✓	✓	✓
Effective participators		#	✓	✓		✓	✓	✓
✓ – assessed in the grading criteria								
# – opportunities for development								

Annexe D

Wider curriculum mapping

The qualifications in this specification give learners opportunities to develop an understanding of spiritual, moral, ethical, social and cultural issues, as well as an awareness of citizenship, environmental issues, European developments, health and safety considerations and equal opportunities issues.

The BTEC qualifications in this specification make a positive contribution to wider curricular areas as appropriate.

Spiritual, moral, ethical, social and cultural issues

These qualifications contribute to an understanding of:

- **spiritual issues** – for example in *Unit 44: Astronomy* when considering how science and religion have influenced beliefs on how the universe originated
- **moral and ethical issues** – for example in *Unit 5: Perceptions of Science* looking at the ethics of scientific development and in *Unit 18: Genetics and Genetic Engineering* when considering how the technology relates to societies' morals and ethics
- **social and cultural issues** – for example in *Unit 29: Physiological Investigations* when communicating with patients about various physiological conditions.

Citizenship issues

Equal opportunities issues are implicit throughout the BTEC qualifications in this specification.

Environmental issues

Learners undertaking the BTEC qualifications in this specification will have the opportunity to develop their understanding of environmental issues, for example in *Unit 23: Science for Environmental Technicians* when researching the maintenance of environmental balance.

European developments

Much of the content of the BTEC qualifications in this specification applies throughout Europe even though delivery is in a UK context.

Health and safety considerations

The BTEC qualifications in this specification are practically based and health and safety issues are encountered throughout the units. The European dimensions of legislation when working in science is specifically addressed in *Unit 2: Working in the Science Industry* and *Unit 10: Using Science in the Workplace*.

Equal opportunities issues

Equal opportunities issues are implicit throughout the BTEC qualifications in this specification.

Wider curriculum mapping

Level 3

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8	Unit 9	Unit 10	Unit 11	Unit 12	Unit 13	Unit 14	Unit 15	Unit 16	Unit 17	Unit 18	Unit 19	Unit 20	Unit 21	Unit 22
Spiritual					✓						✓							✓				
Moral and ethical		✓	✓		✓				✓	✓	✓	✓	✓		✓			✓		✓		
Social and cultural	✓	✓	✓		✓				✓	✓								✓				
Citizenship issues		✓								✓											✓	
Environmental issues	✓	✓	✓	✓	✓				✓	✓				✓	✓	✓		✓	✓		✓	✓
European developments	✓	✓	✓	✓						✓												
Health and safety considerations	✓	✓	✓	✓						✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Equal opportunities issues		✓			✓					✓												

	Spiritual	Moral and ethical	Social and cultural	Citizenship issues	Environmental issues	European developments	Health and safety considerations	Equal opportunities issues
Unit 23		✓	✓	✓	✓		✓	
Unit 24				✓	✓		✓	
Unit 25							✓	
Unit 26					✓		✓	
Unit 27					✓		✓	
Unit 28					✓		✓	
Unit 29							✓	
Unit 30							✓	
Unit 31	✓	✓	✓	✓		✓		✓
Unit 32		✓			✓	✓	✓	
Unit 33		✓					✓	
Unit 34	✓	✓	✓	✓		✓	✓	
Unit 35	✓	✓	✓	✓		✓	✓	
Unit 36					✓		✓	
Unit 37		✓	✓			✓		
Unit 38		✓					✓	
Unit 39	✓	✓	✓	✓		✓	✓	✓
Unit 40		✓	✓	✓		✓	✓	
Unit 41	✓	✓	✓	✓			✓	✓
Unit 42		✓	✓		✓	✓	✓	
Unit 43			✓		✓	✓	✓	
Unit 44	✓	✓	✓		✓	✓		

Annexe E

National Occupational Standards/mapping with NVQs

The grid below maps the knowledge covered in the Pearson BTEC Level 3 Certificate, BTEC Level 3 Subsidiary Diploma, BTEC Level 3 90-credit Diploma, BTEC Level 3 Diploma and BTEC Level 3 Extended Diploma in Applied Science against the underpinning knowledge of the Level 3 NVQ in Laboratory and Associated Technical Activities SSC National Occupational Standards.

KEY

# indicates partial coverage of the NVQ unit

a blank space indicates no coverage of the underpinning knowledge

NVQ Laboratory and Associated Technical Activities (LATA) Level 3		BTEC Units											
NVQ Unit	**Element**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
2.07	2.07.01												
	2.07.02												
	2.07.03												
	2.07.04												
2.11	2.11.01												
	2.11.02												
2.13	2.13.01												
	2.13.02												
3.01	3.01.01		#								#		
3.02	3.02.01										#		
	3.02.02										#		
	3.02.03										#		
3.03	3.03.01	#	#	#	#								
	3.03.02	#	#	#	#								
	3.03.03	#	#	#	#								
	3.03.04	#	#	#	#								
	3.03.05	#	#	#	#		#	#	#				
3.04	3.04.01			#			#	#	#	#	#		
	3.04.02		#	#			#	#	#		#		
3.05	3.05.01			#							#		
	3.05.02			#							#		
	3.05.03			#							#		
3.06	3.06.01												
	3.06.02				#								
3.07	3.07.01	#	#	#	#								
	3.07.02	#	#	#	#								
	3.07.03	#	#	#	#								

NVQ Laboratory and Associated Technical Activities (LATA) Level 3		BTEC Units											
NVQ Unit	**Element**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
	3.07.04	#	#	#	#								
	3.07.05	#	#	#	#		#	#	#				
3.08	3.08.01				#								
	3.08.02				#								
	3.08.03				#								
	3.08.04				#								
3.09	3.09.01			#							#		
	3.09.02			#							#		
	3.09.03			#							#		
3.10	3.10.01			#							#		
	3.10.02			#							#		
	3.10.03			#			#	#	#		#		
3.11	3.11.01												
	3.11.02												
3.12	3.12.01												
	3.12.02												
3.13	3.13.01												
	3.13.02												
3.14	3.14.01												
	3.14.02												
	3.14.03												
	3.14.04												
3.15	3.15.01												
	3.15.02												
	3.15.03												
3.16	3.16.01		#								#		
	3.16.02		#										
3.17	3.17.01										#		
	3.17.02										#		
3.18	3.18.01										#		
	3.18.02										#		
3.19	3.19.01		#	#	#		#	#	#				
	3.10.02		#	#	#		#	#	#				
3.20	3.20.01			#		#							
	3.20.02			#		#							
	3.20.03			#		#							
3.21	3.21.01		#										
	3.21.02		#										

NVQ Laboratory and Associated Technical Activities (LATA) Level 3		BTEC Units											
NVQ Unit	**Element**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
3.22	3.22.01												
	3.22.02												
3.23	3.23.01				#								
	3.23.02				#								

NVQ Laboratory and Associated Technical Activities (LATA) Level 3		BTEC Units											
NVQ Unit	**Element**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
2.07	2.07.01												
	2.07.02												
	2.07.03												
	2.07.04												
2.11	2.11.01												
	2.11.02												
2.13	2.13.01			#						#			
	2.13.02			#						#			
3.01	3.01.01												
3.02	3.02.01												
	3.02.02												
	3.02.03												
3.03	3.03.01	#		#	#			#		#	#		
	3.03.02	#		#	#			#		#	#		
	3.03.03	#		#	#			#		#	#		
	3.03.04	#		#	#			#		#	#		
	3.03.05	#		#	#			#		#	#		
3.04	3.04.01			#	#			#		#	#		
	3.04.02			#	#			#		#	#		
3.05	3.05.01	#		#	#			#		#	#		
	3.05.02	#		#	#			#		#	#		
	3.05.03	#		#	#			#		#	#		
3.06	3.06.01										#		
	3.06.02										#		
3.07	3.07.01	#		#	#			#		#	#		
	3.07.02	#		#	#			#		#	#		
	3.07.03	#		#	#			#		#	#		
	3.07.04	#		#	#			#		#	#		
	3.07.05	#		#	#			#		#	#		

NVQ Laboratory and Associated Technical Activities (LATA) Level 3		BTEC Units											
NVQ Unit	**Element**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
3.08	3.08.01												
	3.08.02												
	3.08.03												
	3.08.04												
3.09	3.09.01	#		#	#								
	3.09.02	#		#	#								
	3.09.03	#		#	#								
3.10	3.10.01				#						#		
	3.10.02				#						#		
	3.10.03				#						#		
3.11	3.11.01												
	3.11.02												
3.12	3.12.01												
	3.12.02												
3.13	3.13.01												
	3.13.02												
3.14	3.14.01												
	3.14.02												
	3.14.03												
	3.14.04												
3.15	3.15.01												
	3.15.02												
	3.15.03												
3.16	3.16.01												
	3.16.02												
3.17	3.17.01												
	3.17.02												
3.18	3.18.01					#							
	3.18.02					#							
3.19	3.19.01												
	3.10.02												
3.20	3.20.01												
	3.20.02												
	3.20.03												
3.21	3.21.01												
	3.21.02												
3.22	3.22.01												
	3.22.02												
3.23	3.23.01												
	3.23.02												

NVQ Laboratory and Associated Technical Activities (LATA) Level 3		BTEC Units											
NVQ Unit	**Element**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
2.07	2.07.01												
	2.07.02												
	2.07.03												
	2.07.04												
2.11	2.11.01												
	2.11.02												
2.13	2.13.01												
	2.13.02												
3.01	3.01.01												
3.02	3.02.01												
	3.02.02												
	3.02.03												
3.03	3.03.01					#			#				
	3.03.02					#			#				
	3.03.03					#			#				
	3.03.04					#			#				
	3.03.05					#			#				
3.04	3.04.01					#	#		#				#
	3.04.02					#			#				#
3.05	3.05.01					#	#		#				#
	3.05.02					#	#		#				#
	3.05.03					#	#		#				#
3.06	3.06.01								#				#
	3.06.02								#				#
3.07	3.07.01					#			#				
	3.07.02					#			#				
	3.07.03					#			#				
	3.07.04					#			#				
	3.07.05					#			#				
3.08	3.08.01								#				
	3.08.02								#				
	3.08.03								#				
	3.08.04								#				
3.09	3.09.01		#			#			#				#
	3.09.02					#			#				#
	3.09.03					#			#				#
3.10	3.10.01		#										
	3.10.02		#										
	3.10.03		#										

NVQ Laboratory and Associated Technical Activities (LATA) Level 3		BTEC Units											
NVQ Unit	**Element**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
3.11	3.11.01												
	3.11.02												

NVQ Laboratory and Associated Technical Activities (LATA) Level 3		BTEC Units											
NVQ Unit	**Element**	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**
3.12	3.12.01												
	3.12.02												
3.13	3.13.01												
	3.13.02												
3.14	3.14.01												
	3.14.02												
	3.14.03												
	3.14.04												
3.15	3.15.01												
	3.15.02												
	3.15.03												
3.16	3.16.01						#						
	3.16.02						#						
3.17	3.17.01												
	3.17.02												
3.18	3.18.01	#					#						
	3.18.02	#					#						
3.19	3.19.01	#											
	3.10.02												
3.20	3.20.01					#							
	3.20.02					#							
	3.20.03					#							
3.21	3.21.01												
	3.21.02												
3.22	3.22.01												
	3.22.02												
3.23	3.23.01												
	3.23.02												

NVQ Laboratory and Associated Technical Activities (LATA) Level 3		BTEC Units							
NVQ Unit	**Element**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**
2.07	2.07.01								
	2.07.02								
	2.07.03								
	2.07.04								
2.11	2.11.01								
	2.11.02								
2.13	2.13.01								#
	2.13.02								#
3.01	3.01.01								
3.02	3.02.01								
	3.02.02								
	3.02.03								
3.03	3.03.01				#				#
	3.03.02				#				#
	3.03.03				#				#
	3.03.04				#				#
	3.03.05				#				#
3.04	3.04.01				#				#
	3.04.02				#				#
3.05	3.05.01				#				#
	3.05.02				#				#
	3.05.03				#				#
3.06	3.06.01				#				
	3.06.02				#				
3.07	3.07.01				#				
	3.07.02				#				
	3.07.03				#				
	3.07.04				#				
	3.07.05				#				
3.08	3.08.01				#				
	3.08.02				#				
	3.08.03				#				
	3.08.04				#				
3.09	3.09.01				#				
	3.09.02				#				
	3.09.03				#				
3.10	3.10.01								
	3.10.02								
	3.10.03								

NVQ Laboratory and Associated Technical Activities (LATA) Level 3		BTEC Units							
NVQ Unit	**Element**	**37**	**38**	**39**	**40**	**41**	**42**	**43**	**44**
3.11	3.11.01								
	3.11.02								
3.12	3.12.01								
	3.12.02								
3.13	3.13.01								
	3.13.02								
3.14	3.14.01								
	3.14.02								
	3.14.03								
	3.14.04								
3.15	3.15.01								
	3.15.02								
	3.15.03								
3.16	3.16.01								
	3.16.02								
3.17	3.17.01								
	3.17.02								
3.18	3.18.01					#			
	3.18.02					#			
3.19	3.19.01								
	3.10.02								
3.20	3.20.01								
	3.20.02								
	3.20.03								
3.21	3.21.01								
	3.21.02								
3.22	3.22.01								
	3.22.02								
3.23	3.23.01								
	3.23.02								

National Occupational Standards/mapping with NVQs

The grid below maps the knowledge covered in the Pearson BTEC Level 3 Certificate, BTEC Level 3 Subsidiary Diploma, BTEC Level 3 90 credits Diploma, BTEC Level 3 Diploma and BTEC Level 3 Extended Diploma in Applied Science against the underpinning knowledge of the Level 3 NVQ in Laboratory Science SSC National Occupational Standards.

KEY

# indicates partial coverage of the NVQ unit

a blank space indicates no coverage of the underpinning knowledge

Laboratory Science Level 3 Common Mandatory units	**BTEC Units**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
O45NLABS2_01		#	#	#						#		
O45NLABS2_02	#	#	#	#						#		
O45NLABS3_03												
O45NALBS3_15	#	#		#								
O45NLABS3_22	#	#				#				#		
Analytical & Process Science Pathway	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
O45NLABS3_04		#								#		
O45NLABS3_05												
O45NLABS4_10			#			#		#	#			
O45NLABS3_06				#								
O45NLABS3_07				#								
O45NLABS3_08												
O45NLABS3_09												
O45NLABS3_10												
O45NLABS3_11												
O45NLABS3_12												
O45NLABS3_13												
O45NLABS3_14												
O45NLABS3_16		#		#								
O45NLABS3_17	#											
O45NLABS3_18		#										
O45NLABS3_19												
O45NLABS3_20				#								
O45NLABS3_21				#								
O45NLABS3_23		#										

Laboratory Science Level 3 Common Mandatory units	BTEC Units											
	13	14	15	16	17	18	19	20	21	22	23	24
O45NLABS2_01							#					
O45NLABS2_02												
O45NLABS3_03												
O45NALBS3_15							#			#		
O45NLABS3_22												
Analytical & Process Science Pathway	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**
O45NLABS3_04												
O45NLABS3_05												
O45NLABS4_10										#		
O45NLABS3_06							#			#		
O45NLABS3_07												
O45NLABS3_08												
O45NLABS3_09							#					
O45NLABS3_10												
O45NLABS3_11												
O45NLABS3_12												
O45NLABS3_13												
O45NLABS3_14												
O45NLABS3_16												
O45NLABS3_17												
O45NLABS3_18										#		
O45NLABS3_19												
O45NLABS3_20										#		
O45NLABS3_21							#			#		
O45NLABS3_23												

Laboratory Science Level 3 Common Mandatory units	BTEC Units							
	25	26	27	28	29	30	31	32
O45NLABS2_01								
O45NLABS2_02								#
O45NLABS3_03								
O45NALBS3_15		#	#	#				
O45NLABS3_22					#	#		#
Analytical & Process Science Pathway	**25**	**26**	**27**	**28**	**29**	**30**	**31**	**32**
O45NLABS3_04								
O45NLABS3_05								
O45NLABS4_10								#
O45NLABS3_06								
O45NLABS3_07								
O45NLABS3_08								
O45NLABS3_09								
O45NLABS3_10								
O45NLABS3_11								
O45NLABS3_12								
O45NLABS3_13								
O45NLABS3_14								
O45NLABS3_16								
O45NLABS3_17								
O45NLABS3_18								
O45NLABS3_19								
O45NLABS3_20								
O45NLABS3_21		#	#	#				
O45NLABS3_23								

Annexe F

Unit mapping overview

NQf BTEC National in Applied Science (specification end date 31/08/2010)/new versions of the BTEC qualifications in Applied Science (specification start date 01/09/2010) – the Pearson BTEC Level 3 Certificate in Applied Science, BTEC Level 3 Subsidiary Diploma in Applied Science, BTEC Level 3 90 credits Diploma in Applied Science, BTEC Level 3 Diploma in Applied Science and the BTEC Level 3 Extended Diploma in Applied Science.

KEY

P – Partial mapping (some topics from the old unit appear in the new unit)

F – Full mapping (topics in old unit match new unit exactly or almost exactly)

X – Full mapping + new (all the topics from the old unit appear in the new unit, but new unit also contains new topic(s))

Unit	Unit title	Maps to old unit	Extent to match
1	Fundamentals of Science	1	X
2	Working in the Science Industry	2	F
3	Scientific Investigations	3	F
4	Scientific Practical Techniques	4	P
5	Perceptions of Science	5	F
6	Using Mathematical Tools in Science	6	X
7	Mathematical Calculations for Science	7	X
8	Using Statistics in Science	8	X
9	Informatics in Science	9	F
10	Using Science in the Workplace	10	F
11	Physiology of Human Body Systems	11	P
12	Physiology of Human Regulation and Reproduction	12	F
13	Biochemistry and Biochemical Techniques	13	P
14	Energy Changes, Sources and Applications	14	F
15	Microbiological Techniques	15	F
16	Chemistry for Biology Technicians	16	F
17	Electrical Circuits and their Applications	17	F
18	Genetics and Genetic Engineering	18	P
19	Practical Chemical Analysis	19	P
20	Medical Physics Techniques	20	P
21	Biomedical Science Techniques	21	X
22	Chemical Laboratory Techniques	22	P
23	Science for Environmental Technicians	23	X
24	Principles of Plant and Soil Science	24	X
25	Electronics for Science Technicians	25	F
26	Industrial Chemical Reactions	26	P

Unit	Unit title	Maps to old unit	Extent to match
27	Chemical Periodicity and its Applications	27	P
28	Industrial Applications of Organic Chemistry	28	P
29	Physiological Investigations	29	F
30	Medical Instrumentation	30	F
31	Criminology	31	X
32	Forensic Evidence Collection and Analysis	32	X
33	Forensic Photography	33	F
34	Criminal Psychology	34	F
35	Applications of Forensic Psychology	35	F
36	Forensic Fire Investigations	36	F
37	Forensic Science Informatics	37	P
38	Traffic Accident Investigation	38	F
39	Criminal Investigation Procedures	39	P
40	Criminal Investigation in Practice	40	P
41	Clinical Psychology	n/a – new unit	n/a – new unit
42	Geology of Natural Resources	n/a – new unit	n/a – new unit
43	Diseases and Infections	n/a – new unit	n/a – new unit
44	Astronomy	n/a – new unit	n/a – new unit

Unit mapping in depth

NAf BTEC National in Applied Science (specification end date 31/08/2010)/new versions of the BTEC qualifications in Applied Science (specification start date 01/09/2010) – the BTEC Level 3 Certificate in Applied Science, BTEC Level 3 Subsidiary Diploma in Applied Science, BTEC Level 3 90 credits Diploma in Applied Science, TEC Level 3 Diploma in Applied Science and the BTEC Level 3 Extended Diploma in Applied Science.

New units		Old units		Mapping/comments (new topics in italics)
Number	**Name**	**Number**	**Name**	
Unit 1	Fundamentals of Science	**Unit 1**	Fundamentals of Science	This unit not longer covers electricity and electromagnetic radiation. LO4 is now: 4 *Be able to communicate scientific information.*
Unit 2	Working in the Science Industry	**Unit 2**	Working in the Science Industry	The same unit with improved learning outcomes and content, added assessment and delivery guidance, outline learning plan, and suggested programme of assignments.
Unit 3	Scientific Investigations	**Unit 3**	Scientific Investigation	The same unit with improved learning outcomes and content, added assessment and delivery guidance, outline learning plan, and suggested programme of assignments.
Unit 4	Scientific Practical Techniques	**Unit 4**	Scientific Practical Techniques	Learning outcomes are now: 1 *Be able to use analytical techniques* 2 *Be able to use scientific techniques to separate and assess purity of substances* 3 *Be able to use instruments/sensors for scientific investigations*
Unit 5	Perceptions of Science	**Unit 5**	Perceptions of Science	The same unit with improved learning outcomes and content, added assessment and delivery guidance, outline learning plan, and suggested programme of assignments.
Unit 6	Using Mathematical Tools in Science	**Unit 6**	Application of Numbers for Science Technicians	This unit covers the same content as the previous specification, with greater emphasis on the *importance of accurately collecting and recording data.*
Unit 7	Mathematical Calculations for Science	**Unit 7**	Mathematics for Science Technicians	This unit now covers the use of *algebra, trigonometry and calculus* to solve science problems.

New units		Old units		Mapping/comments (new topics in italics)
Number	**Name**	**Number**	**Name**	
Unit 8	Using Statistics in Science	**Unit 8**	Statistics for Science Technicians	Learning outcomes are now: 1 *Be able to use statistical techniques to investigate scientific problems* 2 *Be able to perform statistical tests to investigate scientific problems.*
Unit 9	Informatics in Science	**Unit 9**	Informatics	Learning outcomes are now: 1 *Know how informatics is used in science* 2 *Be able to collect scientific data* 3 *Be able to store and analyse scientific data.*
Unit 10	Using Science in the Workplace	**Unit 10**	Using Science in the Workplace	The same unit with improved learning outcomes and content, added assessment and delivery guidance, outline learning plan, and suggested programme of assignments.
Unit 11	Physiology of Human Body Systems	**Unit 11**	Physiology of Human Body Systems	Learning outcomes are now: 1 *Know the levels of organisation within the human body* 2 *Be able to relate the structure of the circulatory system to its function in a multi-cellular organism* 3 *Be able to relate the structure of the respiratory system to its function* 4 *Be able to relate the structure of the digestive system to its function* 5 *Understand the immunological function of the lymphatic system.*

New units		Old units		Mapping/comments (new topics in italics)
Number	**Name**	**Number**	**Name**	
Unit 12	Physiology of Human Regulation and Reproduction	**Unit 12**	Physiology of Human Regulation and Reproduction	Learning outcomes are now: 1 *Know the importance of the regulation of body fluids in the human body* 2 *Know the organisation and function of the nervous system* 3 *Understand the homeostatic mechanisms used by the body to maintain the internal environment* 4 *Understand how the structure of the human reproductive system relates to the functions.*
Unit 13	Biochemistry and Biochemical Techniques	**Unit 13**	Biochemical Techniques	Learning outcomes are now: 1 *Be able to investigate properties of water and biological molecules in living organisms* 2 *Understand the structure of proteins* 3 *Be able to investigate the factors that affect the activities of enzymes in biological systems* 4 *Know the difference between aerobic and anaerobic respiration.*
Unit 14	Energy Changes, Sources and Applications	**Unit 14**	Energy Changes, Sources and Applications	Learning outcome 2 is now: 2 *Be able to investigate how changes of temperature or physical state relate to changes in internal energy*
Unit 15	Microbiological Techniques	**Unit 15**	Microbiological Techniques	Learning outcomes 3 and 4 are now: 3 *Be able to determine the factors that influence the growth of micro-organisms* 4 *Know how to identify micro-organisms.*

New units		Old units		Mapping/comments (new topics in italics)
Number	**Name**	**Number**	**Name**	
Unit 16	Chemistry for Biology Technicians	**Unit 16**	Chemistry for Biology Technicians	Learning outcomes 2, 3 and 4 are now: 2 *Be able to show how rates of reaction are affected by varying the reaction conditions* 3 *Be able to interpret key features of equilibrium processes* 4 *Be able to demonstrate the structure and properties of simple organic molecules.*
Unit 17	Electrical Circuits and their Applications	**Unit 17**	Electrical Circuits and their Industrial Applications	Learning outcomes are now: 1 *Know principal electrical terms, quantities and relationships* 2 *Be able to measure electrical values by construction of series and parallel circuits* 3 *Understand the characteristics of AC and DC circuits* 4 *Understand the health and safety aspects of working with electricity* 5 Know the uses of transducers and measurement devices.
Unit 18	Genetics and Genetic Engineering	**Unit 18**	Genetics and Genetic Engineering	Learning outcomes 1-3 are now: 1 *Understand the process of protein synthesis* 2 *Be able to investigate the process of cell division in eukaryotic cells* 3 *Understand the principles of Mendelian genetics.*
Unit 19	Practical Chemical Analysis	**Unit 19**	Practical Chemical Analysis	Learning outcomes 1-3 are now: 1 *Be able to use standard solutions in quantitative analysis* 2 *Be able to analyse data from spectroscopic techniques to provide analytical information about chemical substances* 3 *Be able to use chromatographic techniques to analyse mixtures of chemical substances.*

New units		Old units		Mapping/comments (new topics in italics)
Number	**Name**	**Number**	**Name**	
Unit 20	Medical Physics Techniques	**Unit 20**	Medical Physics Techniques	The same unit with improved learning outcomes and content, added assessment and delivery guidance, outline learning plan, and suggested programme of assignments.
Unit 21	Biomedical Science Techniques	**Unit 21**	Biomedical Science Techniques	Learning outcomes 4 and 5 are: 4 *Know the importance of cell pathology as a diagnostic tool* 5 *Understand how the chemical make-up of the body influences health and disease.*
Unit 22	Chemical Laboratory Techniques	**Unit 22**	Chemical Laboratory Techniques	Learning outcomes are now: *1 Be able to prepare substances* *2 Be able to measure percentage yield and percentage purity* *3 Be able to carry out qualitative analysis of compounds* *4 Be able to carry out quantitative analysis of compounds within a matrix.*
Unit 23	Science for Environmental Technicians	**Unit 23**	Science for Environmental Technicians	The same unit with improved learning outcomes and content, added assessment and delivery guidance, outline learning plan, and suggested programme of assignments.
Unit 24	Principles of Plant and Soil Science	**Unit 24**	Principles of Plant and Soil Science	The same unit with improved learning outcomes and content, added assessment and delivery guidance, outline learning plan, and suggested programme of assignments. In addition learning outcome 4 is now: 4 Know the ways in which people can influence plant and soil processes.
Unit 25	Electronics for Science Technicians	**Unit 25**	Electronics for Science Technicians	The same unit with improved learning outcomes and content, added assessment and delivery guidance, outline learning plan, and suggested programme of assignments.

New units		Old units		Mapping/comments (new topics in italics)
Number	**Name**	**Number**	**Name**	
Unit 26	Industrial Chemical Reactions	**Unit 26**	Industrial Applications of Chemical Reactions	Learning outcomes are now: 1 *Understand how to calculate enthalpy changes from experimental and supplied data* 2 *Be able to investigate rates of chemical reactions in terms of the factors that influence them* 3 *Understand the principles of chemical equilibrium* 4 Understand how physical chemistry concepts are applied to the control of industrial processes.
Unit 27	Chemical Periodicity and its Applications	**Unit 27**	Chemical Periodicity and its Applications	Learning outcomes are now: 1 *Know how physical and chemical properties of elements and their compounds are related to the positions of the elements in the periodic table* 2 *Understand how the properties of substances influence their production and uses* 3 *Know analytical procedures based on oxidation and reduction* 4 *Be able to investigate practically a range of reactions involving solutions of transition metal ions.*
Unit 28	Industrial Applications of Organic Chemistry	**Unit 28**	Industrial Applications of Organic Chemistry	Learning outcomes are now: 1 *Know the properties of hydrocarbons* 2 *Know the properties of simple functional group compounds* 3 *Understand the importance of isomerism* 4 *Be able to carry out reactions involving organic compounds.*
Unit 29	Physiological Investigations	**Unit 29**	Physiological Investigations	The same unit with improved learning outcomes and content, added assessment and delivery guidance, outline learning plan, and suggested programme of assignments.

New units		Old units		Mapping/comments (new topics in italics)
Number	**Name**	**Number**	**Name**	
Unit 30	Medical Instrumentation	**Unit 30**	Medical Instrumentation	The same unit with improved learning outcomes and content, added assessment and delivery guidance, outline learning plan, and suggested programme of assignments.
Unit 31	Criminology	**Unit 31**	Criminology	Learning outcomes are now: 1 Understand how competing definitions of crime influence its measurement 2 Know the theoretical explanations of crime 3 Understand the role of the media in our perception of crime 4 Know how the aims of state penal policy relate to crime theories.
Unit 32	Forensic Evidence Collection and Analysis	**Unit 32**	Forensic Evidence Collection and Analysis	The same unit with improved learning outcomes and content, added assessment and delivery guidance, outline learning plan, and suggested programme of assignments.
Unit 33	Forensic Photography	**Unit 33**	Forensic Photography	The same unit with improved learning outcomes and content, added assessment and delivery guidance, outline learning plan, and suggested programme of assignments.
Unit 34	Criminal Psychology	**Unit 34**	Criminal Psychology	The same unit with improved learning outcomes and content, added assessment and delivery guidance, outline learning plan, and suggested programme of assignments.
Unit 35	Applications of Forensic Psychology	**Unit 35**	Forensic Psychology	The same unit with improved learning outcomes and content, added assessment and delivery guidance, outline learning plan, and suggested programme of assignments.
Unit 36	Forensic Fire Investigation	**Unit 36**	Forensic Fire Investigation	The same unit with improved learning outcomes and content, added assessment and delivery guidance, outline learning plan, and suggested programme of assignments.

New units		Old units		Mapping/comments (new topics in italics)
Number	**Name**	**Number**	**Name**	
Unit 37	Forensic Science Informatics	**Unit 37**	Forensic Science Informatics	Learning outcomes are now: 1 *Be able to use information and communication technologies to obtain forensic information* 2 *Know how internet misuse is policed* 3 *Know the common methods of computer sabotage* 4 *Be able to use computer software to produce a document that could be used for forensic purposes.*
Unit 38	Traffic Accident Investigation	**Unit 38**	Traffic Accident Investigation	The same unit with improved learning outcomes and content, added assessment and delivery guidance, outline learning plan, and suggested programme of assignments.
Unit 39	Criminal Investigation Procedures	**Unit 39**	Criminal Investigation Procedures	Learning outcome 4 is now: 4 Understand the relationship between crime prevention methods and criminal investigations.
Unit 40	Criminal Investigation in Practice	**Unit 40**	Criminal Investigation Practice	Learning outcomes are now: 1 *Be able to research a crime case, appreciating the various procedures and practices involved in evidence collection* 2 *Know the contribution of those involved in various stages of the investigation process* 3 *Be able to use fundamental interviewing and communication skills to obtain intelligence information* 4 *Understand how the investigating team involved in the crime case reached their conclusions and whether they were justified.*

Annexe G

Examples of calculation of qualification grade above pass grade

Pearson will automatically calculate the qualification grade for learners when unit grades are submitted.

The generic examples below demonstrate how the qualification grade above pass is calculated.

Points available for credits achieved at different levels and unit grades

The table below shows the **number of points scored per credit** at the unit level and grade.

Unit level	Points per credit		
	Pass	Merit	Distinction
Level 2	5	6	7
Level 3	**7**	**8**	**9**
Level 4	9	10	11

Learners who achieve the correct number of points within the ranges shown in the 'qualification grade' table below will achieve the qualification merit, distinction or distinction* grades (or combinations of these grades appropriate to the qualification).

Qualification grade

BTEC Level 3 Certificate

Points range above pass grade	Grade	
230-249	Merit	M
250-259	Distinction	D
260 and above	Distinction*	D*

BTEC Level 3 Subsidiary Diploma

Points range above pass grade	Grade	
460-499	Merit	M
500-519	Distinction	D
520 and above	Distinction*	D*

BTEC Level 3 90-credit Diploma

Points range above pass grade	Grade
660-689	MP
690-719	MM
720-749	DM
750-769	DD
770-789	D*D
790 and above	D*D*

BTEC Level 3 Diploma

Points range above pass grade	Grade
880-919	MP
920-959	MM
960-999	DM
1000-1029	DD
1030-1059	D*D
1060 and above	D*D*

BTEC Level 3 Extended Diploma

Points range above pass grade	Grade
1300-1339	MPP
1340-1379	MMP
1380-1419	MMM
1420-1459	DMM
1460-1499	DDM
1500-1529	DDD
1530-1559	D*DD
1560-1589	D*D*D
1590 and above	D*D*D*

Example 1

Achievement of pass qualification grade

A learner completing a 30-credit BTEC Level 3 Certificate **does not** achieve the points required to gain a merit qualification grade.

	Level	Credit	Grade	Grade points	Points per unit = credit x grade
Unit 1	3	10	Pass	7	10 × 7 = 70
Unit 2	3	10	Pass	7	10 × 7 = 70
Unit 3	3	10	Merit	8	10 × 8 = 80
Qualification grade totals		**30**	**Pass**		**220**

Example 2

Achievement of merit qualification grade

A learner completing a 30-credit BTEC Level 3 Certificate achieves the points required to gain a merit qualification grade.

	Level	Credit	Grade	Grade points	Points per unit = credit x grade
Unit 1	3	10	Pass	7	10 × 7 = 70
Unit 2	3	10	Merit	8	10 × 8 = 80
Unit 3	3	10	Merit	8	10 × 8 = 80
Qualification grade totals			**Merit**		**230**

Example 3

Achievement of distinction qualification grade

A learner completing a 60 credits BTEC Level 3 Subsidiary Diploma achieves the points required to gain a distinction qualification grade.

	Level	Credit	Grade	Grade points	Points per unit = credit x grade
Unit 1	3	10	Merit	8	10 × 8 = 80
Unit 2	3	10	Distinction	9	10 × 9 = 90
Unit 3	3	10	Distinction	9	10 × 9 = 90
Unit 5	3	10	Merit	8	10 × 8 = 80
Unit 6	2	10	Distinction	7	10 × 7 = 70
Unit 11	3	10	Distinction	9	10 × 9 = 90
Qualification grade totals		**60**	**Distinction**		**500**

Example 4

Achievement of distinction distinction grade

A learner completing a BTEC Level 3 90 credits Diploma achieves the points required to gain a distinction distinction qualification grade.

	Level	Credit	Grade	Grade points	Points per unit = credit x grade
Unit 1	3	10	Merit	8	10 × 8 = 80
Unit 2	3	10	Distinction	9	10 × 9 = 90
Unit 3	3	10	Distinction	9	10 × 9 = 90
Unit 4	3	10	Merit	8	10 × 8 = 80
Unit 5	3	10	Merit	8	10 × 8 = 80
Unit 6	2	10	Distinction	7	10 × 7 = 70
Unit 11	3	10	Distinction	9	10 × 9 = 90
Unit 15	4	10	Merit	10	10 × 10 = 100
Unit 17	3	10	Pass	7	10 × 7 = 70
Qualification grade totals		**90**	**Distinction Distinction**		**750**

Example 5

Achievement of distinction merit qualification grade

A learner completing a 120 credits BTEC Level 3 Diploma achieves the points required to gain a distinction merit qualification grade.

	Level	Credit	Grade	Grade points	Points per unit = credit x grade
Unit 1	3	10	Merit	8	10 × 8 = 80
Unit 2	3	10	Distinction	9	10 × 9 = 90
Unit 3	3	10	Distinction	9	10 × 9 = 90
Unit 4	3	10	Merit	8	10 × 8 = 80
Unit 5	3	10	Merit	8	10 × 8 = 80
Unit 6	2	10	Distinction	7	10 × 7 = 70
Unit 11	3	10	Distinction	9	10 × 9 = 90
Unit 15	4	10	Merit	10	10 × 10 = 100
Unit 17	3	10	Pass	7	10 × 7 = 70
Unit 18	3	10	Pass	7	10 × 7 = 70
Unit 25	3	20	Merit	8	20 × 8 = 160
Qualification grade totals		**120**	**Distinction Merit**		**980**

Example 6

Achievement of merit merit merit qualification grade

A learner completing a 180 credits BTEC Level 3 Extended Diploma achieves the points required to gain a merit merit merit qualification grade.

	Level	Credit	Grade	Grade points	Points per unit = credit x grade
Unit 1	3	10	Merit	8	10 × 8 = 80
Unit 2	3	10	Pass	7	10 × 7 = 70
Unit 3	3	10	Distinction	9	10 × 9 = 90
Unit 4	3	10	Merit	8	10 × 8 = 80
Unit 5	3	10	Pass	7	10 × 7 = 70
Unit 6	2	10	Distinction	7	10 × 7 = 70
Unit 11	3	10	Distinction	9	10 × 9 = 90
Unit 12	3	10	Merit	8	10 × 8 = 80
Unit 15	4	10	Pass	9	10 × 9 = 90
Unit 17	3	10	Pass	7	10 × 7 = 70
Unit 18	3	10	Pass	7	10 × 7 = 70
Unit 20	3	10	Pass	7	10 × 7 = 70
Unit 22	3	10	Merit	8	10 × 8 = 80
Unit 25	3	20	Pass	7	20 × 7 = 140
Unit 35	3	10	Distinction	9	10 × 9 = 90
Unit 36	3	10	Merit	8	10 × 8 = 80
Unit 38	3	10	Distinction	9	10 × 9 = 90
Qualification grade totals		**180**	**Merit Merit Merit**		**1410**

The Periodic Table of Elements

1	2											3	4	5	6	7	0 (8)
																	(18)
							1.0 H hydrogen 1										4.0 He helium 2
(1)	(2)											(13)	(14)	(15)	(16)	(17)	
6.9 Li lithium 3	9.0 Be beryllium 4											10.8 B boron 5	12.0 C carbon 6	14.0 N nitrogen 7	16.0 O oxygen 8	19.0 F fluorine 9	20.2 Ne neon 10
23.0 Na sodium 11	24.3 Mg magnesium 12	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	27.0 Al aluminium 13	28.1 Si silicon 14	31.0 P phosphorus 15	32.1 S sulfur 16	35.5 Cl chlorine 17	39.9 Ar argon 18
39.1 K potassium 19	40.1 Ca calcium 20	45.0 Sc scandium 21	47.9 Ti titanium 22	50.9 V vanadium 23	52.0 Cr chromium 24	54.9 Mn manganese 25	55.8 Fe iron 26	58.9 Co cobalt 27	58.7 Ni nickel 28	63.5 Cu copper 29	65.4 Zn zinc 30	69.7 Ga gallium 31	72.6 Ge germanium 32	74.9 As arsenic 33	79.0 Se selenium 34	79.9 Br bromine 35	83.8 Kr krypton 36
85.5 Rb rubidium 37	87.6 Sr strontium 38	88.9 Y yttrium 39	91.2 Zr zirconium 40	92.9 Nb niobium 41	95.9 Mo molybdenum 42	[98] Tc technetium 43	101.1 Ru ruthenium 44	102.9 Rh rhodium 45	106.4 Pd palladium 46	107.9 Ag silver 47	112.4 Cd cadmium 48	114.8 In indium 49	118.7 Sn tin 50	121.8 Sb antimony 51	127.6 Te tellurium 52	126.9 I iodine 53	131.3 Xe xenon 54
132.9 Cs caesium 55	137.3 Ba barium 56	138.9 La* lanthanum 57	178.5 Hf hafnium 72	180.9 Ta tantalum 73	183.8 W tungsten 74	186.2 Re rhenium 75	190.2 Os osmium 76	192.2 Ir iridium 77	195.1 Pt platinum 78	197.0 Au gold 79	200.6 Hg mercury 80	204.4 Tl thallium 81	207.2 Pb lead 82	209.0 Bi bismuth 83	[209] Po polonium 84	[210] At astatine 85	[222] Rn radon 86
[223] Fr francium 87	[226] Ra radium 88	[227] Ac* actinium 89	[261] Rf rutherfordium 104	[262] Db dubnium 105	[266] Sg seaborgium 106	[264] Bh bohrium 107	[277] Hs hassium 108	[268] Mt meitnerium 109	[271] Ds darmstadtium 110	[272] Rg roentgenium 111							

Elements with atomic numbers 112-116 have been reported but not fully authenticated

Key

relative atomic mass
atomic symbol
name
atomic (proton) number

140 Ce cerium 58	141 Pr praseodymium 59	144 Nd neodymium 60	[147] Pm promethium 61	150 Sm samarium 62	152 Eu europium 63	157 Gd gadolinium 64	159 Tb terbium 65	163 Dy dysprosium 66	165 Ho holmium 67	167 Er erbium 68	169 Tm thulium 69	173 Yb ytterbium 70	175 Lu lutetium 71
232 Th thorium 90	[231] Pa protactinium 91	238 U uranium 92	[237] Np neptunium 93	[242] Pu plutonium 94	[243] Am americium 95	[247] Cm curium 96	[245] Bk berkelium 97	[251] Cf californium 98	[254] Es einsteinium 99	[253] Fm fermium 100	[256] Md mendelevium 101	[254] No nobelium 102	[257] Lr lawrencium 103

* Lanthanide series

* Actinide series

ma030816/Nationals90CreditV2/9781446934715_BTEC_90c_L3_AppSci_Iss3.indd/89/3

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