BTEC Level 2

BTEC Firsts Specification

Pearson BTEC Level 2 Certificate, BTEC Level 2 Extended Certificate and BTEC Level 2 Diploma in Blacksmithing and Metalworking

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Issue 3

ALWAYS LEARNING

PEARSON

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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 the Pearson website: www.pearson.com

These qualifications were previously entitled:

Edexcel BTEC Level 2 Certificate in Blacksmithing & Metalworking (QCF)

Edexcel BTEC Level 2 Extended Certificate in Blacksmithing & Metalworking (QCF)

Edexcel BTEC Level 2 Diploma in Blacksmithing & Metalworking (QCF)

The QNs remain the same.

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Contents

BTEC First qualification titles covered by this specification

Pearson BTEC Level 2 Certificate in Blacksmithing and Metalworking

Pearson BTEC Level 2 Extended Certificate in Blacksmithing and Metalworking

Pearson BTEC Level 2 Diploma in Blacksmithing and Metalworking

These qualifications have been accredited to the Regulated Qualification Framework and are eligible for public funding as determined by the Department for Education (DfE) under Sections 96 of the Learning and Skills Act 2000.

The qualification titles listed above feature in the funding lists published annually by the DfE and the regularly updated website. The Qualification Number (QN) should be used by centres when they wish to seek public funding for their learners. Each unit within a qualification will also have a unit reference number.

The qualification and unit reference numbers will appear on the learners' final certification documentation.

The Qualification Numbers for the qualifications in this publication are:

Pearson BTEC Level 2 Certificate in Blacksmithing and Metalworking	600/0208/6
Pearson BTEC Level 2 Extended Certificate in Blacksmithing and Metalworking	600/0213/X
Pearson BTEC Level 2 Diploma in Blacksmithing and Metalworking	600/0214/1

These qualification titles will appear on learners' certificates. Learners need to be made aware of this when they are recruited by the centre and registered with Pearson.

What are BTEC Firsts?

BTEC First qualifications are undertaken in further education and sixth-form colleges, schools and other training providers, and have been since they were introduced in 1983. Their purpose, approaches to teaching, learning and assessment are established and understood by teaching professionals, employers and learners alike.

The BTEC First qualifications within this specification:

Pearson BTEC Level 2 Certificate in Blacksmithing and Metalworking

Pearson BTEC Level 2 Extended Certificate in Blacksmithing and Metalworking

Pearson BTEC Level 2 Diploma in Blacksmithing and Metalworking.

But for clarity and continuity they are referred to generically as BTEC First qualifications, where appropriate and maintain the same equivalences, benchmarks and other articulations (for example SCAAT points) as their predecessor qualifications. The following identifies the titling conventions and variations between the predecessor and new specifications.

Predecessor BTEC Firsts (accredited 2006)	Predecessor BTEC Firsts (for delivery from September 2010)
Pearson Level 2 BTEC First Diploma	Pearson BTEC Level 2 Diploma
Pearson Level 2 BTEC First Certificate	Pearson BTEC Level 2 Extended Certificate
Not applicable	Pearson BTEC Level 2 Certificate

BTEC Firsts are Level 2 qualifications designed to provide specialist work-related qualifications in a range of sectors. They give learners the knowledge, understanding and skills that they need to prepare for employment. The qualifications also provide career development opportunities for those already in work. Consequently they provide a course of study for full-time or part-time learners in schools, colleges and training centres.

BTEC Firsts 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 Standards Setting Body (SSB) or Sector Skills Council (SSC). A number of BTEC Firsts are recognised as Technical Certificates and form part of the Apprenticeship Framework. They attract achievement and attainment points that equate to similar-sized general qualifications.

On successful completion of a BTEC First qualification, learners 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 2 qualifications is availble in the following sizes:

- Certificate – 150 TQT – (15 credits, 90 GLH)
- Extended Certificate – 300 TQT – (30 credits, 180 GLH)
- Diploma – 600 TQT – (60 credits, 360 GLH)

Pearson BTEC Level 2 Certificate – 15 credits

The 15-credit BTEC Level 2 Certificate offers a specialist qualification that focuses on particular aspects of employment within the appropriate vocational sector. The BTEC Level 2 Certificate is a qualification which can extend a learner's programme of study and provide a vocational emphasis. The BTEC Level 2 Certificate is broadly equivalent to one GCSE.

The BTEC Level 2 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 2 Extended Certificate – 30 credits

The 30-credit BTEC Level 2 Extended Certificate extends the specialist work-related focus from the BTEC First Award and covers the key knowledge and practical skills required in the appropriate vocational sector. The BTEC Level 2 Extended Certificate offers flexibility and a choice of emphasis through the optional units. It is broadly equivalent to two GCSEs.

The BTEC Level 2 Extended Certificate 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 related GCSE, a complementary NVQ or another qualification. These learning programmes can be developed to allow learners to study complementary qualifications without duplication of content.

For adult learners the BTEC Level 2 Extended Certificate can extend their experience of work in a particular sector. It is a suitable qualification for those wishing to change career or move into a particular area of employment following a career break.

Pearson BTEC Level 2 Diploma – 60 credits

The 60-credit BTEC Level 2 Diploma extends the specialist work-related focus from the BTEC Level 2 Extended Certificate. 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 four GCSEs.

Some learners may wish to gain the qualification in order to enter a specialist area of employment or to progress to a Level 3 programme. Other learners may want to extend the specialism they studied on the BTEC Level 2 Certificate or the BTEC Level 2 Extended Certificate programme.

Key features of the BTEC Firsts in Blacksmithing and Metalworking

The BTEC Firsts in Blacksmithing and Metalworking have been developed in the blacksmithing and metalworking sectors to:

- provide education and training for learners interested in employment and/or further education in blacksmithing, farriery and metalworking and/or associated sectors
- provide opportunities for employees who currently work in blacksmithing, farriery and rural craft industries to achieve a nationally recognised Level 2 vocationally specific qualification
- give full-time learners the opportunity to enter employment in the blacksmithing and metalworking sector or to progress to vocational qualifications such as the Pearson BTEC Level 3 Nationals in Blacksmithing and Metalworking
- 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 the BTEC Firsts in Blacksmithing and Metalworking

The BTEC Firsts in Blacksmithing and Metalworking have been developed to provide entry and progression into and within the blacksmithing and metalworking industries. Pearson has included the knowledge, understanding and technical skills that employers will need from learners entering this sector in the coming years.

These qualifications are part of a wide suite of environmental and land-based qualifications offered by Pearson and are designed primarily for 14 to 19 learners seeking employment and/or further learning in the sector. They are also available to other learners who may already have experience within the sector but seek a nationally recognised qualification as part of their career. The qualifications are aimed at those interested in blacksmithing and other rural metal craft roles. The qualifications are made up from discrete 5 and 10 credit units of learning that give learners explicit recognition of their learning in education and work. BTEC First qualifications are free to be delivered and assessed using a range of traditional and contemporary models such as full-time, part-time and e-learning, tutors are free to create innovative and creative assessments that fit local requirements whilst maintaining a national standard.

National Occupational Standards

BTEC Firsts 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 in due course. NOS form the basis of National Vocational Qualifications (NVQs). BTEC Firsts 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.

The Pearson BTEC Level 2 Firsts in Blacksmithing and Metalworking relate to the following NOS:

- Level 2 Design
- Level 2 Fabrication and Welding
- Level 2 Farriery
- Level 2 Horse Care.

Rules of combination for Pearson BTEC Level 2 First qualifications

The rules of combination specify the:

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

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

Pearson BTEC Level 2 Certificate

1 Qualification credit value: a minimum of 15 credits.

2 Minimum credit to be achieved at, or above, the level of the qualification: 8 credits.

3 Mandatory unit credit: 10.

4 Optional unit credit: 5.

Pearson BTEC Level 2 Extended Certificate

1 Qualification credit value: a minimum of 30 credits.

2 Minimum credit to be achieved at, or above, the level of the qualification: 16 credits.

3 Mandatory unit credit: 10.

4 Optional unit credit: 20.

Pearson BTEC Level 2 Diploma

1 Qualification credit value: a minimum of 60 credits.

2 Minimum credit to be achieved at, or above, the level of the qualification: 31 credits.

3 Mandatory unit credit: 20.

4 Optional unit credit: 40.

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

Pearson BTEC Level 2 Certificate in Blacksmithing and Metalworking

The Pearson BTEC Level 2 Certificate in Blacksmithing and Metalworking is 15-credits and has 90-guided-learning-hours (GLH). It consists of 10 mandatory credits from Group A and remaining credits from Groups A or B) that provide for a combined total of 15 credits (where at least 8 credits must be at Level 2 or above).

Pearson BTEC Level 2 Certificate in Blacksmithing and Metalworking			
Unit	**Group A - choose a minimum of 10 credits**	**Credit**	**Level**
1	Introduction to Forgework Preparation, Processes, Techniques and Safe Working	10	2
2	Introduction to Forgework Construction Tools, Techniques and Safe Working	10	2
	Group B		
3	2D Visual Communication	5	2
4	3D Visual Communication	5	2
5	Using Ideas to Explore, Develop and Produce Art and Design	10	2
6	Contextual References in Art and Design	10	2
7	Building an Art and Design Portfolio	5	2
8	Working with 3D Design Briefs	10	2
9	Working with 3D Design Crafts Briefs	10	2
10	Application of Welding Processes	10	2
11	Fabrication Techniques and Sheet Metal Work	10	2
12	Working with Blacksmithing Specifications and Calculations	5	2
13	Undertake Horse Handling	5	2
14	Introduction to the Principles of Horse Behaviour	5	2
15	Understand the Principles of Horse Biology	10	2
16	Introduction to Land-based Workshop Practice	10	2

Pearson BTEC Level 2 Extended Certificate in Blacksmithing and Metalworking

The Pearson BTEC Level 2 Extended Certificate in Blacksmithing and Metalworking is 30-credits and has 180-guided-learning-hours (GLH). It consists of 10 mandatory credits from Group A and remaining credits from Groups A or B) that provide for a combined total of 30 credits (where at least 16 credits must be at Level 2 or above).

Pearson BTEC Level 2 Extended Certificate in Blacksmithing and Metalworking			
Unit	**Group A - choose a minimum of 10 credits**	**Credit**	**Level**
1	Introduction to Forgework Preparation, Processes, Techniques and Safe Working	**10**	**2**
2	Introduction to Forgework Construction Tools, Techniques and Safe Working	**10**	**2**
	Group B		
3	2D Visual Communication	**5**	**2**
4	3D Visual Communication	**5**	**2**
5	Using Ideas to Explore, Develop and Produce Art and Design	**10**	**2**
6	Contextual References in Art and Design	**10**	**2**
7	Building an Art and Design Portfolio	**5**	**2**
8	Working with 3D Design Briefs	**10**	**2**
9	Working with 3D Design Crafts Briefs	**10**	**2**
10	Application of Welding Processes	**10**	**2**
11	Fabrication Techniques and Sheet Metal Work	**10**	**2**
12	Working with Blacksmithing Specifications and Calculations	**5**	**2**
13	Undertake Horse Handling	**5**	**2**
14	Introduction to the Principles of Horse Behaviour	**5**	**2**
15	Understand the Principles of Horse Biology	**10**	**2**
16	Introduction to Land-based Workshop Practice	**10**	**2**

Pearson BTEC Level 2 Diploma in Blacksmithing and Metalworking

The Pearson BTEC Level 2 Diploma in Blacksmithing and Metalworking is 60-credits and has 360-guided-learning-hours (GLH). It consists of two mandatory units plus optional units that provide for a combined total of 60 credits (where at least 31 credits must be at Level 2 or above).

Pearson BTEC Level 2 Diploma in Blacksmithing and Metalworking			
Unit	**Mandatory units**	**Credit**	**Level**
1	Introduction to Forgework Preparation, Processes, Techniques and Safe Working	10	2
2	Introduction to Forgework Construction Tools, Techniques and Safe Working	10	2
Unit	**Optional units**	**Credit**	**Level**
3	2D Visual Communication	5	2
4	3D Visual Communication	5	2
5	Using Ideas to Explore, Develop and Produce Art and Design	10	2
6	Contextual References in Art and Design	10	2
7	Building an Art and Design Portfolio	5	2
8	Working with 3D Design Briefs	10	2
9	Working with 3D Design Crafts Briefs	10	2
10	Application of Welding Processes	10	2
11	Fabrication Techniques and Sheet Metal Work	10	2
12	Working with Blacksmithing Specifications and Calculations	5	2
13	Undertake Horse Handling	5	2
14	Introduction to the Principles of Horse Behaviour	5	2
15	Understand the Principles of Horse Biology	10	2
16	Introduction to Land-based Workshop Practice	10	2

Assessment and grading

In BTEC Firsts all units are internally assessed.

Assessment for BTEC First qualifications is criterion referenced, based on the achievement of all the 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 grading distinction criteria.

Grading domains

The assessment and 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 First 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 *An nexe 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 be built on the unit 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 including written reports, graphs, 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 on 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 unit assessment and grading criteria 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 2 First qualifications*).

Qualification grades above pass grade

Learners will be awarded a merit or distinction or distinction* qualification grade 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 1	3	4	5
Level 2	5	6	7
Level 3	7	8	9

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.

Qualification grade

Qualification	Points range above pass grade		
	Merit	Distinction	Distinction*
BTEC Level 2 Certificate	85-94	95-99	100 and above
BTEC Level 2 Extended Certificate	170-189	190-199	200 and above
BTEC Level 2 Diploma	340-379	380-399	400 and above

Please refer to *Annexe E* 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 to be awarded the qualification. This is covered in the statement of 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 additional guidance and amplification related to the unit to support tutors, deliverers and assessors and to provide for a coherence of understanding and a 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 these BTEC First and National programmes:

- 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.

Pearson Quality Assurance Handbook

Centres should refer to the *Handbook for Quality Assurance for BTEC Qualifications*, 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 First and National programmes. Centres that do not comply with remedial action plans may have their approval to deliver qualifications removed.

Programme design and delivery

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

In BTEC Firsts 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 BTEC Firsts. 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

BTEC Firsts 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 First 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 which demonstrates one way in 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 First 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.

Limitations on variations from standard specifications

The flexibility to import standard units from other BTEC Firsts is limited to a total of 25 per cent of the qualification credit value (see Rules of combination for Pearson BTEC Level 2 First qualifications).

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 at the same level as, or one level above, the Diploma course of study. The ASL may include BTEC qualifications which are also available to learners not following a Diploma course of study.

Qualifications for ASL must be selected from the ASL catalogue through The Diploma Validator. To access the catalogue go to diplomavalidator.qcda.gov.uk.

Further units may be added to qualifications within the catalogue and centres undertaking, or preparing to undertake, ASL should refer regularly to the Pearson website for information regarding additions.

Functional Skills

BTEC Firsts 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 a 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 also be apparent as learners progress throughout their learning.

Access and recruitment

Pearson'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 qualifications 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 2 qualification. For learners who have recently been in education, the profile is likely to include one of the following:

- a BTEC Level 1 qualification in a land-based, art and design, engineering or a related vocational area
- a standard of literacy and numeracy supported by a general education equivalent to four GCSEs at grade D-G
- other related Level 1 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 First qualifications are for learners aged 14 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 police checks.

Pearson BTEC Level 2 Firsts are listed on the DfE funding lists Section 96 and Section 97.

Access arrangements and special considerations

Pearson's policy on access arrangements and special considerations for BTEC and Pearson NVQ qualifications aims to enhance access to the qualifications for learners with disabilities and other difficulties (as defined by the 1995 Disability Discrimination Act and the amendments to the Act) without compromising the assessment of skills, knowledge, understanding or competence.

Further details are given in the policy document *Access Arrangements and Special Considerations for BTEC and Pearson NVQ Qualifications*, which can be found on the Pearson website (www.pearson.com). This policy replaces the previous Pearson policy (Assessment of Vocationally Related Qualification: Regulations and Guidance Relating to Learners with Special Requirements, 2002) concerning learners with particular requirements.

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 and 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 sufficient, reliable and valid.

Unit format

All units in Pearson BTEC Level 2 First 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

In BTEC First qualifications each unit consists of 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 achieved all the learning outcomes of the unit.

Guided learning hours

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

Aim and purpose

The aim provides a clear summary of the purpose of the unit and 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 the delivery of the unit to cover all of the unit content.

It is not a requirement of the unit specification that all of the 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 their acquisition of knowledge, understanding and skills.

Content structure and terminology

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

- Learning outcome: this is shown 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 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 could be covered or 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* – gives 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 learner resource material that benchmarks the level of study.

Units

Unit 1: Introduction to Forgework Preparation, Processes, Techniques and Safe Working

Unit reference number: M/502/7603
Level 2: BTEC First
Credit value: 10
Guided learning hours: 60

Aim and purpose

This unit aims to introduce learners to the knowledge and practical skills associated to forging processes used in blacksmithing and metalworking, and how this can be applied in practice. It is designed for learners in centre-based settings looking to progress to the sector or on to further education.

Unit introduction

Forging techniques are essential elements of the blacksmithing and metalworking industries. This unit introduces the underpinning knowledge that is the basis of all blacksmithing skills. It introduces learners to:

- workshop health and safety – safety hazards within the blacksmithing industry and specific risks associated with forgework processes and the maintenance and use of equipment
- forge management – control and maintenance of solid fuel and gas forges
- tooling – maintenance of common forge tools
- forging – hammering metal into different shapes and sections on the anvil
- forming – the skills of bending and twisting metal
- cutting – hot punching and cutting
- joining – using forge welding and riveting techniques.

Learners will apply safe working practices to include use of personal protective and equipment and show consideration for others. They will learn awareness of hazards when working with a solid fuel forge hearth or mobile furnace, assess the level of risk and comply with establishment safety rules.

Learners will look at basic forgework practices, including the management of the forge fire and forge workshop safety. Efficient fire control is essential for the quality forging of metal, and learners will be shown how to recognise, service and maintain the forge hearth and fire safely during the working process. Recognition and safe use of the common forgework tools are important aspects of the work process and learners are expected to inspect, report faults and demonstrate the safe use of tools for set tasks. Learners will be shown the differing effects of forging on mild steel.

Learning outcomes

On completion of this unit a learner should:

1 Know forging, forming, cutting and joining techniques used in the workshop forge

2 Be able to demonstrate basic forging, forming, cutting and joining techniques used in the workshop forge

3 Be able to prepare and maintain common forge tooling

4 Know safe working in the workshop forge.

Unit content

1 Know forging, forming, cutting and joining techniques used in the workshop forge

Forging techniques on mild steel to include: upsetting; drawing down; spreading; setting down; bending to specification; twisting; cutting; splitting; punching holes accurately

Assembly of finished item from forged elements using basic joining techniques: riveting; forge welding

Appropriate forge tool selection: appropriate to each task

Control of forge heat to produce desired effects: oxidising; neutral and carburising areas

2 Be able to demonstrate basic forging, forming, cutting and joining techniques used in the workshop forge

Common forging tasks: use of top and bottom anvil tools fullers/swages; smith and striker; forging; forming; cutting; joining; teamworking where appropriate; health and safety

3 Be able to prepare and maintain common forge tooling

Forge preparation for work: identification of forge requirements (chimney, hood, fire bed, slide valve, tue iron, back bosh, front bosh, air supply); hearth tools eg rake, shovel, poker; fault identification; clearing and preparation of the hearth; building the fire

Range of blacksmith's hand tools: hammers; tongs; punches; chisels; wire brush; top and bottom tools; files

Parts of the anvil: face; step; table; beak; heal; throat; pritchel hole; hardie hole; inner and outer edge.

Identification and reporting the condition of common faults and related hazards in basic forge tools: mushroomed heads; deformed shanks; loose handles/shafts; lubrication; line of reporting

Maintenance of common forge tools: sharpening; grinding; fitting of handles

4 Know safe working in the workshop forge

Safe working at all times: hazards and risks (identification, prevention); health and safety; ergonomics; forge shop layout; first aid materials (location, use); fire equipment and procedures (location, safe use)

Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

Assessment and grading criteria					
To achieve a pass grade the evidence must show that the learner is able to:		**To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:**		**To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:**	
P1	describe the construction of the solid fuel forge hearth and efficient fire control [RL]	**M1**	carry out given forging tasks safely, identifying the risks and hazards associated with them	**D1**	review the finished products recommending quality improvements.
P2	describe specified forging, forming, cutting and joining techniques [RL]				
P3	identify appropriate forge workshop tools and equipment [IE]				
P4	safely use common forging techniques	**M2**	justify the techniques used in contributing to the production of a forged artefact		
P5	safely use common forming techniques [TW, EP]				
P6	safely use common cutting techniques				
P7	safely use common joining techniques				
P8	describe inspection and maintenance routines [SM]	**M3**	use recognised and safe techniques to repair and maintain common forge equipment.		
P9	identify the condition of a range of common forge equipment				
P10	identify hazards and risks in the forgework environment [IE]				
P11	describe appropriate actions to prevent hazards and risks in the forgework environment.				

PLTS: This summary references where applicable, in the square brackets, the elements of the personal, learning and thinking skills applicable in the pass criteria. It identifies opportunities for learners to demonstrate effective application of the referenced elements of the skills.

Key	IE – independent enquirers	RL – reflective learners	SM – self-managers
	CT – creative thinkers	TW – team workers	EP – effective participators

Essential guidance for tutors

Delivery

Delivery of this unit involves practical and written assessments and visits to suitable collections. The unit should have links to industrial experience placements.

Tutors delivering this unit have opportunities to use as wide a range of techniques as possible. Lectures, discussions, seminar presentations, site visits, supervised workshop practicals, research using the internet and/or library resources and the use of personal and/or industrial experience are all be suitable.

Work placements should be monitored regularly to ensure the quality of the learning experience. It would be beneficial if learners and supervisors were made aware of the unit requirements before any work-related activities take place so that naturally occurring evidence can be collected at the time. They should be encouraged to ask for observation records and/or witness statements to be provided as evidence. Guidance on the use of observation records and witness statements is provided on the Pearson website (www.pearson.com).

Whichever delivery methods are used, it is essential that tutors stress the importance of sound environmental management and the need to manage resources using legal methods.

Visiting expert speakers could add to the relevance of the subject. For example, an experienced blacksmith manager could talk about their work, the situations they face and the methods they use.

Health and safety issues relating to working in the forge environment must be addressed and reinforced regularly. Risk assessments must be undertaken before practical activities take place. Adequate PPE must be provided and used following the production of suitable risk assessments.

Tutors should consider integrating the delivery, private study and assessment for this unit with other relevant units and assessment instruments that learners are taking as part of their programme of study.

Learning outcome 1 covers the principles of commonly used forgework techniques. It is likely to be delivered through formal lectures, discussion and supervised practicals. The techniques may be delivered largely as separate elements but as learners gain confidence and competence, a more holistic approach can be adopted with the introduction of more complex tasks requiring the use of several techniques in combination.

Learning outcome 2 covers the practices of working as a team member performing recognised forging techniques. The health and safety aspect of the tasks must be addressed before the delivery of the practcals. The success of this outcome is directly linked to the understanding of the principles and practice of forge hearth control and the safe use of common forge tooling and equipment. Learners should be encouraged to gain an understanding of proper fire control using industrially relevant forge equipment. Learners must be introduced to the forge, the anvil and to the hand tools appropriate to the skills they are practising. Actual tools and equipment should be used where possible to illustrate maintenance and health and safety issues. This is likely to be delivered through formal lectures, discussion and supervised practicals. The health and safety aspect of the tasks must be addressed before the delivery of the practical task.

Learning outcome 3 covers the principles and practices of forge equipment maintenance. This is likely to be delivered through formal lectures, discussion and supervised practicals and independent learner research. The Health and Safety aspect of the tasks must be addressed before the delivery of the practical task.

Learning outcome 4 covers health and safety in the workshop. Learners will develop their knowledge of the health and safety requirements, and produce risk assessments, for given tasks.

Outline learning plan

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments.

The outline learning plan gives an indication of the volume of learning it would take the average learner to achieve the learning outcomes. It is indicative and is one way of achieving the credit value.

Learning time should address all learning (including assessment) relevant to the learning outcomes, regardless of where, when and how the learning has taken place.

Topic and suggested assignments/activities and/assessment
Introduction and overview of the unit.
Assignment 1: Health and Safety in the Workshop (P3, P10, P11) Tutor introduces the assignment The learner will: • identify 20 hazards in the workshop and justify a procedure to minimise the risk • produce a risk assessment for given forge techniques.
Tutors to explain the legislation governing health and safety at work and responsibilities of all parties.
Tutors to introduce learners to the workshops and potential hazard associated with the principles, techniques, equipment and materials associated with the craft.
Tutors to explain the concept of risk assessment.
Tutor to simulate 20 hazards likely to be found in a metalworking shop.
Tutors to demonstrations the safe use and operation of the solid fuel hearth and gas furnaces.
Learner research and production of workshop record.
Learner assessment/feedback.
Assignment 2: Forged Items (P1, P2, P4, P5, P6, P7, M1, M2, D1) Tutor introduces the assignment. Learners will describe and produce forged items using traditional techniques use traditional finishing techniques and display items on a board for assessment (learners are encouraged to produce an artefact that combines several of the techniques). Learners will be assessed as a team member assisting in traditional forging techniques. Learners should prepare a presentation demonstrating an evaluative approach to the making process and tooling used in this assignment recommending improvements.
Tutors to demonstrate forging, forming, cutting and joining techniques.
Tutors to demonstrate the correct method and safe procedures when performing team forging activities.
Learner research and assignment preparation/writing.
Learner presentation of assignment.
Learner assessment/feedback.

Topic and suggested assignments/activities and/assessment
Assignment 3: Maintenance of Common Forge Equipment (P8, P9, M3) Tutor introduces the assignment. Learners are to produce checklists covering the condition and maintenance procedure of the tools used during the performance Assignment 2. Learners are to perform maintenance activities on basic forge tooling and justify the techniques used in contributing to the production of a forged artefact in Assignment 2.
Learner research and assignment preparation/writing.
Learner presentation of assignment.
Learner assessment/feedback.
Unit review.

Assessment

Where possible, to ensure assessment is fair, the size and complexity of the tasks should be the same for all learners.

For P1, P2 and P3, learners will provide information on forging techniques and tools. Evidence could take the form of a pictorial presentation with notes (possibly using appropriate software or an overhead projector) witness statements and/or logs or an assignment.

For P4, P5, P6 and P7, learners must safely carry out common forgework techniques of forging, forming, cutting and joining under supervision. Evidence could take the form of manufactured test pieces, witness statements and/or logbooks.

For P8 and P9, learners must provide information on the inspection and reporting of maintenance requirements of relevant routines and equipment. Learners are expected to provide evidence for at least six types of hand tool. The hand tools may be the same as those used to provide evidence for other grading criteria. Evidence could take the form of a pictorial presentation with notes (possibly using appropriate software or an overhead projector) witness statements and logs or a written assignment.

For P10 and P11, learners will provide information on hazards in the workshop and improvements to minimise risk. Evidence could take the form of a pictorial presentation with notes (possibly using appropriate software or an overhead projector) witness statements and logs or a written assignment.

For M1, learners must demonstrate the efficient fire control of a solid fuel forge hearth and identify the risks and hazards associated with them. Evidence could be in the same form as for P4.

For M2, learners are required to justify the techniques used in contributing to the production of a forged artefact. Evidence could take the form of a pictorial presentation with notes (possibly using appropriate software or an overhead projector) witness statements and logbooks.

For M3, learners are required to use recognised and safe techniques to repair and maintain common forge equipment. Evidence could be in the same format as that suggested for P4.

For D1, learners must review the finished products and recommend improvements. Learners are expected to review the finished product against the original objectives in terms of specified tolerances of accuracy and finish. Recommendations for improvement must be appropriate and viable, these could be identified during the making process and, where appropriate, improvements to making quality should be demonstrated within the components/artefacts produced.

Programme of suggested assignments

The following table shows a programme of suggested assignments that cover the pass, merit and distinction criteria in the grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Pearson assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P3, P10, P11	Health and Safety in the Workshop	The financial and personal costs to the industry and the individual as a result of injury at work cannot be underestimated. Identify 20 hazards in the workshop that may cause injury and justify a procedure to minimise the risk. Produce a risk assessment for given forging tasks.	Oral questioning Written assignment or presentation Maintenance checklist Tooling and forged examples Visual records Research
P1, P2, P4, P5, P6, P7, M1, M2, D1	Forged Items	You are attending an interview for a job as a trainee blacksmith at a forge and have been asked to produce a series of forged samples covering the core forgework skills and demonstrating your control of the solid fuel hearth and ability to work as a member of a team.	Practical production of samples and components/artefacts Observation records completed by learners and the tutor Work logs or other relevant learner notes and drawings Witness statements Visual records Oral questioning
P8, P9, M3	Maintenance of Common Forge Equipment	As a trainee blacksmith you have limited funds and the cheapest option is to purchase second-hand tools. You will need to maintain these tools and identify faults listing the requirements to bring them back into service.	Oral questioning Written assignment or presentation Maintenance checklist Tooling and forged examples Visual records Research

Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

This unit forms part of the BTEC land-based sector suite. This unit has particular links with:

Level 2	Level 3
Introduction to Forgework Construction Techniques	Understanding and Using Forging Techniques for Blacksmithing and Metalworking
Working with 3D Design Briefs	Undertake Forge Practice for Blacksmithing and Metalworking
Working with 3D Design Crafts Briefs	

The unit also has links with the following units from the Lantra National Occupational Standards in Farriery:

- Unit Far2 Prepare, light and maintain the forge fire
- Unit FA13 Fabricate horseshoes and tools.

Essential resources

Learners will need supervised access to workshops and classrooms appropriate to their specialist pathways. These should include a comprehensive range of blacksmithing and forge tools and equipment, including gas and solid fuel forge hearths, anvils and leg vices supported by a range of tongs, hammers, swages, fullers and other ancillary equipment.

Health and safety considerations require that sufficient facilities be provided to allow for one forging station and tooling per learner. Health and safety information and support must be provided.

Learners must have access to a sufficiently diverse range of materials and stock sizes/sections to explore this unit fully.

This unit requires vocationally-specific craft knowledge and requires appropriately qualified tutors to deliver it.

Employer engagement and vocational contexts

This unit focuses on introducing the core skills and underpinning knowledge associated with the practical operation of the blacksmith's hearth and related common forging skills. Tutors are encouraged to promote learner/employer links by introducing learners to suppliers of tools, fuels and materials. Visits to or by suppliers should be encouraged. The national and international variation in the use of the various types of solid fuel forge hearth and fuels should be explained.

Indicative reading for learners

Textbooks

Andrews J – *New Edge of the Anvil: A Resource Book for the Blacksmith* (Skipjack Printing, 1994) ISBN 978-1879535091

Bealer A – *The Art of Blacksmithing* (Castle, 1996) ISBN 978-0785803959

Blandford P – *Practical Handbook of Blacksmithing and Metal Work* (Bantam Doubleday Dell Publishing Group, 1998) ISBN 978-0318148915

Bray S – *Metalworking: Tools and Techniques* (The Crowood Press, 2003) ISBN 978-1861265739

McDaniel R – *Blacksmithing Primer: A Course in Basic and Intermediate Blacksmithing* (Dragonfly Enterprises, 2004) ISBN 978-0966258912

Parkinson P – *The Artist Blacksmith: Design and Techniques* (The Crowood Press, 2001) ISBN 978-1861264282

Rural Development Commission – *The Blacksmith's Craft, 2nd Edition* (Countryside Agency, 1990) ISBN 978-1869964146

Rural Development Commission – *Wrought Ironwork: A Manual of Instruction for Craftsmen* (Rural Industries Bureau, 1957) ASIN B002MGPQIS

Journals

Artist Blacksmith

Forge

The Worshipful Company of Blacksmiths newsletter

Websites

www.baba.org.uk	British Artist Blacksmiths Association
www.blacksmithscompany.org.uk	Worshipful Company of Blacksmiths
www.hse.gov.uk	Health and Safety Executive
www.nafbae.org	National Association of Farriers, Blacksmiths and Agricultural Engineers

Delivery of personal, learning and thinking skills (PLTS)

The following table identifies the PLTS opportunities that have been included within the assessment criteria of this unit:

Skill	When learners are …
Independent enquirers	researching the possible effects of heating, oxidation, burning, work hardening, forging, bending and twisting on the grain structure of ferrous metals
Creative thinkers	selecting and combining common forgework techniques to produce component(s) or artefact(s)
Reflective learners	evaluating the process and tooling used to produce the finished component(s)/ artefact(s) and making recommendations for improvement
Team workers	preparing and using an inspection and maintenance checklist and reporting on the condition of a range of common forge equipment
Self-managers	carrying out common heat treatments of normalising and annealing on forged steel and controlling the effects of oxidation and overheating
Effective participators	preparing and using an inspection and maintenance checklist and reporting on the condition of a range of common forge equipment.

Although PLTS opportunities are identified within this unit as an inherent part of the assessment criteria, there are further opportunities to develop a range of PLTS through various approaches to teaching and learning.

Functional Skills – Level 2

Skill	When learners are …
ICT – Use ICT systems	
Select, interact with and use ICT systems independently for a complex task to meet a variety of needs	researching forgework and health and safety issues associated with techniques used in the workplace
Manage information storage to enable efficient retrieval	storing researched forgework and health and safety issues associated with techniques used in the workplace for retrieval and collation in to a final draft
ICT – Find and select information	
Select and use a variety of sources of information independently for a complex task	researching forgework and health and safety issues associated with techniques used in the workplace
ICT – Develop, present and communicate information	
Enter, develop and format information independently to suit its meaning and purpose including: • text and tables • images • numbers • records	providing photos charts and schedules for given maintenance procedures and practical tasks to be collated into a final draft
Bring together information to suit content and purpose	collating data and submit as final draft of an assignment
Present information in ways that are fit for purpose and audience	submitting a final draft of an assignment to include annotated charts diagrams and photographs
Mathematics	
Understand routine and non-routine problems in a wide range of familiar and unfamiliar contexts and situations	accurately measuring and calculating materials used to meet given forging objectives
Identify the situation or problem and the mathematical methods needed to tackle it	accurately measuring and calculating materials used to meet given forging objectives using recognised formula
Select and apply a range of skills to find solutions	choosing the appropriate formula to calculate the size of stock material needed to meet forging objectives
Use appropriate checking procedures and evaluate their effectiveness at each stage	accurately measure and recalculate material needs to meet the given forging objectives
Interpret and communicate solutions to practical problems in familiar and unfamiliar routine contexts and situations	choosing the appropriate formula to calculate the size of stock material needed to meet forging objectives

Skill	When learners are …
English	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	taking part in group discussions and presentations to explain health and safety issues and techniques used in forgework.
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	researching forgework and health and safety issues associated with techniques used in the workplace
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	submitting a final draft of an assignment to include annotated charts diagrams and photographs and evaluative text.

Unit 2: Introduction to Forgework Construction Tools, Techniques and Safe Working

Unit reference number: T/502/7604
Level 2: BTEC First
Credit value: 10
Guided learning hours: 60

Aim and purpose

This unit aims to introduce learners to knowledge of forgework construction tools and techniques. It covers practical uses of these in blacksmithing and metalworking and understanding of safe working. It is designed for learners in centre-based settings looking to progress into the sector or on to further education.

Unit introduction

Construction techniques are essential elements of the blacksmithing and metalworking industries. This unit introduces the underpinning knowledge that is the basis for combining blacksmithing skills when making finials and motifs used in the production of gates, railing and screens. It introduces learners to:

- workshop health and safety – safety hazards within the blacksmithing industry and specific risks associated with the production of elements manufactured using traditional construction techniques
- traditional joining techniques – tenons, clips, wraps, rivets and welds
- manufacture basic forge tools – slot punch, drift, monkey tool.

Learning outcomes

On completion of this unit a learner should:

1 Know common forgework construction tools and techniques

2 Be able to use forgework construction techniques

3 Be able to produce finished elements/motifs

4 Understand safe working when using forgework construction techniques

Unit content

1 Know common forgework construction tools and techniques

Forging techniques on mild steel: scrolls; twists; tooling; punching and drifting; appropriate blacksmiths tool selection for all forging tasks

Construction of finished items from forged elements using a basic joining technique: tenons; clips; wraps; rivets and welds

Evaluation of work: techniques used; accuracy of execution; surface finish

2 Be able to use forgework construction techniques

Forging techniques on mild steel: scrolls; twists; tooling; punching and drifting; appropriate blacksmiths tool selection for all forging tasks

Teamwork: appropriate collaborative skills

3 Be able to produce finished elements/motifs

Construction of finished items from forged elements using a basic joining technique: tenons; clips; wraps; rivets and welds

4 Understand safe working practice when using forgework construction techniques

Safe working at all times: risk assessments for set forging tasks; minimise damage to equipment; relevant legislation and codes of practice eg Health and Safety at Work Act 1974

Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

Assessment and grading criteria					
To achieve a pass grade the evidence must show that the learner is able to:		**To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:**		**To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:**	
P1	describe common forgework joining techniques [RL, IE]	**M1**	use common forging techniques to manufacture tooling used in construction of an artefact	**D1**	evaluate the final outcome, tool manufacture methods making recommendations for improvement.
P2	describe common elements/ motifs				
P3	outline the use of specialised tooling in common joining techniques				
P4	outline the use of specialised tooling in the production of common elements/motifs				
P5	produce appropriate specialised tooling for the production of common joining processes [EP]	**M2**	justify the techniques used in contributing to the production of a forged artefact		
P6	prepare common joining processes within a specified construction [EP,TW]				
P7	prepare a working drawing for the production of a specialised element/motif [EP,TW]	**M3**	use common forging techniques to manufacture the elements used in the production of an artefact.		
P8	produce a finished element/ motif to agreed specification				
P9	explain all health and key safety considerations when using forgework construction techniques. [IE, RL]				

PLTS: This summary references where applicable, in the square brackets, the elements of the personal, learning and thinking skills applicable in the pass criteria. It identifies opportunities for learners to demonstrate effective application of the referenced elements of the skills.

Key	IE – independent enquirers	RL – reflective learners	SM – self-managers
	CT – creative thinkers	TW – team workers	EP – effective participators

Essential guidance for tutors

Delivery

Delivery of this unit will involve practical and written assessments and visits to suitable collections. It will have links to industrial experience placements.

Tutors delivering this unit have opportunities to use as wide a range of techniques as possible. Lectures, discussions, seminar presentations, site visits, supervised workshop practicals, research using the internet and/or library resources and the use of personal and/or industrial experience would all be suitable. Delivery should stimulate, motivate, educate and enthuse learners.

Work placements should be monitored regularly in order to ensure the quality of the learning experience. It would be beneficial if learners and supervisors were made aware of the requirements of this unit before any work-related activities take place so that naturally occurring evidence can be collected at the time. They should be encouraged to ask for observation records and/or witness statements to be provided as evidence. Guidance on the use of observation records and witness statements is provided on the Pearson website (www.pearson.com).

Whichever delivery methods are used, it is essential that tutors stress the importance of sound environmental management and the need to manage resources using legal methods.

Visiting expert speakers could add to the relevance of the subject for learners. For example, an experienced blacksmith manager could talk about their work, the situations they face and the methods they use.

Health and safety issues relating to working in the forge environment must be stressed and reinforced regularly, and risk assessments must be undertaken before practical activities. Adequate PPE must be provided and used following the production of suitable risk assessments.

Tutors should consider integrating the delivery, private study and assessment for this unit with other relevant units and assessment instruments learners are taking as part of their programme of study.

Learning outcome 1 covers the principles of commonly used forgework construction techniques. It is likely to be delivered through formal lectures, discussion and supervised practicals. The techniques may be delivered largely as separate elements but as learners gain confidence and competence, a more holistic approach can be adopted with the introduction of more complex tasks requiring the use of several techniques in combination. The health and safety aspect of the tasks must be addressed before the delivery of the practicals. Success in this outcome is directly linked to the understanding of the principles and practice of forge hearth control and the safe use of common forge tooling and equipment. Learners will be encouraged to gain an understanding of proper fire control using industrially relevant forge equipment. Learners must be introduced to the hand tools appropriate to the skills they are practising. Actual tools and equipment should be used where possible to illustrate maintenance and health and safety issues.

Learning outcome 2 covers the principles and practices of working as a team member performing recognised construction techniques. This is likely to be delivered through formal lectures, discussion and supervised practicals. The health and safety aspect of the tasks must be addressed before the delivery of the practical task.

Learning outcome 3 covers the principles and practices used in the production of forged elements that will be joined using constructional techniques. This is likely to be delivered through formal lectures, discussion and supervised practicals and independent learner research. The health and safety aspect of the tasks must be addressed before the delivery of the practical task.

Learning outcome 4 covers the hazards associated with constructional techniques and how to minimise the risk of injury and damage to equipment.

Outline learning plan

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments.

The outline learning plan gives an indication of the volume of learning it would take the average learner to achieve the learning outcomes. It is indicative and is one way of achieving the credit value.

Learning time should address all learning (including assessment) relevant to the learning outcomes, regardless of where, when and how the learning has taken place.

Topic and suggested assignments/activities and/assessment
Introduction and overview of the unit.
Assignment 1: Safety and Damage Limitation (P9) Tutor introduces the assignment. Learners will: • identify hazards associated with performing constructional techniques and justify a procedure to minimise the risk • produce a risk assessment for given forge tasks • explain procedures to minimizes damage to tooling when forging elements and constructing an artefact.
Tutors to demonstrate constructional techniques used in the artefact.
Tutors to demonstrate the production of forged elements used in the artefact.
Learner research and production of workshop records.
Learner assessment/feedback.
Assignment 2: Forged Items (P1, P2, P3, P4, P5, P6, P7, P8, M1, M2, M3, D1) Tutor introduces the assignment. Learners will: • produce information on common forgework construction tools and techniques • use common forging techniques to manufacture tooling used in construction of an artefact • manufacture forged items to be combined using constructional techniques • prepare and join items to produce a decorative artefact • use traditional finishing techniques and display the artefact (learners are encouraged to produce their own artefact that combines several of the techniques) • evaluate the forged artefacts and methods of tool manufacture recommending improvements in the quality of the finished items and processes • justify techniques used in contributing to the production of a forged artefact. Learners will be assessed as team members assisting in traditional forging techniques. Learners should prepare a presentation demonstrating an evaluative approach to the making process and tooling used in this assignment, recommending improvements.
Tutors to demonstrate constructional techniques used in the artefact
Tutors to demonstrate the production of forged elements used in the artefact
Tutors to demonstrate traditional finishing techniques.
Learner research and production of workshop records.
Learner assessment/feedback.

Assessment

Where possible, to ensure fairness of assessment, the size and complexity of the tasks should be the same for all learners.

For P1, P2, P3 and P4 learners must investigate blacksmithing construction methods Learners are expected to provide evidence covering all of the construction methods listed in the unit content. These criteria could be assessed from an assignment.

For P5, P6 and D1, learners must carry out and evaluate common constructional techniques to join the forged elements to meet given objectives. Learners should include the possible effects of poor fire control and forging technique on the structure of steel and effectiveness of the joining method. Tutors should identify the objectives or agree them through discussion with learners. The objectives may be the same as those used to provide evidence for other grading criteria. Evidence could take the form of manufactured test pieces, a pictorial presentation with notes (possibly using appropriate software or an overhead projector) witness statements and logbooks or written assignments.

For P7, P8 and M3, learners must prepare working drawings, use forging techniques to manufacture elements/motifs and finish agreed elements/motifs. Evidence could take the form of manufactured test pieces, a pictorial presentation with notes (possibly using appropriate software or an overhead projector) witness statements and logbooks or assignments.

For P9, learners will provide information on safety issues surrounding forgework construction techniques. Evidence could take the form of a pictorial presentation with notes (possibly using appropriate software or an overhead projector) witness statements and logs or an assignment.

For M1, learners must demonstrate use common forging techniques to manufacture tooling used in construction of an artefact. Evidence could take the form of manufactured tools, a pictorial presentation with notes (possibly using appropriate software or an overhead projector) witness statements and log books or written assignments.

For M2, learners must justify the techniques used when contributing to the production of a forged artefact. Evidence could take the form of a pictorial presentation with notes (possibly using appropriate software or an overhead projector) witness statements and logbooks or written assignments.

Programme of suggested assignments

The following table shows a programme of suggested assignments that cover the pass, merit and distinction criteria in the grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Pearson assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P9	Safety and Damage Limitation	The financial and personal costs to the industry and the individual as a result of injury at work cannot be underestimated. As a trainee you will be asked to assist your employer in the manufacture of gates, railings and screens containing decorative elements and motifs, held together using traditional techniques.	Oral questioning Written assignment or presentation Maintenance checklist
P1, P2, P3, P4, P5, P6, P7, P8, M1, M2, M3, D1	Forged Items	As a trainee you will be asked to assist your employer in the manufacture of gates, railings and screens containing decorative elements and motifs held together using traditional techniques.	Practical production of samples and components/artefacts Observation records completed by learners and the tutor Work logs or other relevant learner notes and drawings Witness statements Tooling and forged examples Oral questioning

Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

This unit forms part of the BTEC land-based sector suite. This unit has particular links with:

Level 2	Level 3
Introduction to Forgework Processes	Understanding and Using Forging Techniques for Blacksmithing and Metalworking
Working with 3D Design Briefs	Undertake Forge Practice for Blacksmithing and Metalworking
Working with 3D Design Crafts Briefs	Understanding and Using Blacksmithing and Construction Skills

The unit has links with the following units from the Lantra National Occupational Standards in Farriery:

- Unit FA9 Make horseshoes
- Unit FA13 Fabricate horseshoes and tools.

This unit has links with the following units from the Level 2 SEMTA National Occupational Standards in Fabrication and Welding:

- Unit 21: Marking out components for fabrication.

Essential resources

Learners will need supervised access to sufficiently resourced forge workshops appropriate to their specialist pathways. These should contain a comprehensive range of blacksmithing and forge tools including solid fuel forge hearths, anvils, leg vices, power hammers supported by a range of tongs, hammers, swages, fullers and other ancillary equipment. A sufficiently diverse range of materials and stock, sizes/sections eg mild steel, tool steels, alloys both ferrous and non-ferrous copper, bronze, brass, stainless steel, aluminium, will also be required. Areas for fitting and finishing should be available with access to suitable application and coating facilities.

Learners will need access to a drawing office/studio space suitable for the observational and technical drawing activities. The principal features and items of equipment include technical drawing equipment and art materials, eg drawing boards, compasses, set squares, measuring equipment and consumables. Library and IT facilities should also be available with access to unit-specific examples of drawing practice and internet facilities to enable research into techniques, materials and equipment and work examples.

Health and safety considerations require sufficient facilities be provided, to allow for one forging station per learner. Additional health and safety information and support should be provided.

Tutors delivering this unit should have vocationally-specific craft knowledge.

Employer engagement and vocational contexts

This unit focuses on introducing the core skills and underpinning knowledge associated with the practice of traditional construction techniques used in the blacksmithing industry and related common forging skills.

Tutors are encouraged to promote learner/employer links by introducing learners to suppliers of tools, fuels and materials. Visits to or by suppliers should be encouraged.

The national and international variation in the use of the various types of solid fuel forge hearth and fuels should be explained.

Indicative reading for learners

Textbooks

Andrews J – *New Edge of the Anvil: A Resource Book for the Blacksmith* (Skipjack Printing, 1994) ISBN 978-187953509

Baur-Heinhold M – Decorative Ironwork: Wrought Iron Gratings, Gates and Railings (Schiffer Publishing, 1996) ISBN 978-0764301537

Bealer A – The Art of Blacksmithing (Castle, 1996) ISBN 978-0785803959

Blandford P – Practical Handbook of Blacksmithing and Metal Work (Bantam Doubleday Dell Publishing Group, 1998) ISBN 978-0318148915

Bray S – Metalworking: Tools and Techniques (The Crowood Press, 2003) ISBN 978-1861265739

Campbell M – Decorative Ironwork (V & A Publications, 2002) ISBN 978-1851771967

Chatwin A – Into the New Iron Age: Modern British Blacksmiths (Coach House Publishing, 1995) ISBN 978-0952510505

Hughes R and Rowe M – The Colouring, Bronzing and Patination of Metals (Watson-Guptill Publications, 1991) ISBN 978-0823007622

Lucie-Smith E – The Art of Albert Paley: Iron, Bronze, Steel (Harry N Abrams Inc, 1996) ISBN 978-0810937482

McDaniel R – Blacksmithing Primer: A Course in Basic and Intermediate Blacksmithing (Dragonfly Enterprises, 2004) ISBN 978-0966258912

Marlow F – Welding Fabrication & Repair Tips: Questions and Answers (Industrial Press Inc, 2002) ISBN 978-0831131555

Meilach D – Architectural Ironwork (Schiffer Publishing, 2001) ISBN 978-0764313240

Meilach D – The Contemporary Blacksmith (Schiffer Publishing, 2000) ISBN 978-0764311062

Parkinson P – Forged Architectural Metalwork (Crowood Press Ltd, 2006) ISBN 978-1861268174

Parkinson P – The Artist Blacksmith: Design and Techniques (The Crowood Press, 2001) ISBN 978-1861264282

Ross R – Metallic Materials Specification Handbook 4th Edition (Kluwer Academic Publishers, 1991) ISBN 978-0412369407

Rural Development Commission – The Blacksmith's Craft 2nd Edition (Countryside Agency, 1990) ISBN 978-1869964146

Rural Industries Bureau – Wrought Ironwork: A Manual of Instruction for Craftsmen (Rural Industries Bureau, 1957) ASIN B002MGPQIS

Journals

Artist Blacksmith

Artists Newsletter

Crafts magazine

Forge

Websites

blacksmith.forge.cc/blinks.htm	Blacksmith Forge Links
www.blacksmithingebooks.com	Blacksmithing e-books
www.abana.org	The Artist Blacksmiths Association of North America
www.az-blacksmiths.org	The Arizona Artist Blacksmith Association
www.baba.org.uk	British Artist Blacksmiths Association
www.blacksmithscompany.org.uk	The Worshipful Company of Blacksmiths
www.blacksmithsjournal.com	Blacksmiths Journal
www.centaurforge.com	Centaur Forge
www.craftscouncil.org.uk	Crafts Council
www.hse.gov.uk	Health and Safety Executive
www.nafbae.org	National Association of Farriers, Blacksmiths and Agricultural Engineers
www.naturalengland.org.uk	Natural England

Delivery of personal, learning and thinking skills (PLTS)

The following table identifies the PLTS opportunities that have been included within the assessment criteria of this unit:

Skill	When learners are …
Independent enquirers	researching the possible effects of heating, oxidation, burning, work hardening, forging, bending and twisting on the grain structure of ferrous metals
Creative thinkers	selecting and combining common forgework techniques to produce component(s) or artefact(s)
Reflective learners	evaluating the process and tooling used to produce the finished component(s)/ artefact(s) and making recommendations for improvement
Team workers	preparing and using a range of common forge equipment in the manufacture of components and construction skills used in an artefact
Self-managers	carrying out traditional construction techniques and controlling the effects of oxidation and overheating
Effective participators	preparing and using a range of common forge equipment in the manufacture of components and construction skills used in an artefact.

Although PLTS opportunities are identified within this unit as an inherent part of the assessment criteria, there are further opportunities to develop a range of PLTS through various approaches to teaching and learning.

Functional Skills – Level 2

Skill	When learners are …
ICT – Use ICT systems	
Select, interact with and use ICT systems independently for a complex task to meet a variety of needs	researching forgework and health and safety issues associated with techniques used in the workplace
Use ICT to effectively plan work and evaluate the effectiveness of the ICT system they have used	
Manage information storage to enable efficient retrieval	storing researched forgework and health and safety issues associated with techniques used in the workplace for retrieval and collation in to a final draft
Follow and understand the need for safety and security practices	
Troubleshoot	
ICT – Find and select information	
Select and use a variety of sources of information independently for a complex task	researching forgework and health and safety issues associated with techniques used in the workplace
Access, search for, select and use ICT-based information and evaluate its fitness for purpose	
ICT – Develop, present and communicate information	
Enter, develop and format information independently to suit its meaning and purpose including: • text and tables • images • numbers • records	providing photos charts and schedules for given maintenance procedures and practical tasks to be collated into a final draft
Bring together information to suit content and purpose	collating data and submitting as final draft of an assignment
Present information in ways that are fit for purpose and audience	submitting a final draft of an assignment to include annotated charts diagrams and photographs
Evaluate the selection and use of ICT tools and facilities used to present information	
Select and use ICT to communicate and exchange information safely, responsibly and effectively including storage of messages and contact lists	
Mathematics	
Understand routine and non-routine problems in a wide range of familiar and unfamiliar contexts and situations	accurately measuring and calculating materials used to meet given forging objectives
Identify the situation or problem and the mathematical methods needed to tackle it	accurately measuring and calculating materials used to meet given forging objectives using recognised formula

Skill	When learners are …
ICT – Use ICT systems	
Select and apply a range of skills to find solutions	choosing the appropriate formula to calculate the size of stock material needed to meet forging objectives
Use appropriate checking procedures and evaluate their effectiveness at each stage	accurately measuring and recalculating material needs to meet the given forging objectives
Interpret and communicate solutions to practical problems in familiar and unfamiliar routine contexts and situations	choosing the appropriate formula to calculate the size of stock material needed to meet forging objectives
Draw conclusions and provide mathematical justifications	
English	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	taking part in group discussions and presentations to explain health and safety issues and techniques used in forgework
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	researching forgework and health and safety issues associated with techniques used in the workplace
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	submitting a final draft of an assignment to include annotated charts diagrams and photographs and evaluative text.

Unit 3: 2D Visual Communication

Unit reference number: L/502/4823
Level 2: BTEC First
Credit value: 5
Guided learning hours: 30

Aim and purpose

The aim of this unit is to enable learners to gain an understanding and develop skills in two dimensional (2D) visual communication techniques, such as drawing, painting, photography and print-making.

Learners will follow set assignment briefs that allow them to apply skills through research, development and final design ideas.

Unit introduction

It is essential that artists, designers and craftspeople develop the necessary 2D visual communication skills in order to meet brief requirements; enabling them to express ideas effectively.

This unit explores a wide range of 2D mark-making techniques with reference to formal elements such as line, tone, colour, shape, pattern, texture, form and proportion. Learners should be given the opportunity to experience as many 2D techniques as possible.

Learners will develop skills in this area with a view to completing research, development and final design ideas. This is an essential part of learning; skills and knowledge acquired for this unit will underpin all other units within the qualification.

Assignment briefs with a specific theme should give learners the opportunity to develop skills for this unit.

It is recommended that learners are introduced to 2D techniques offered by the centre through an induction programme followed by more specific assignments, for example a series of banners promoting galleries at the Victoria and Albert Museum. This assignment may include 2D research in the form of sketches and photographs from the museum which can be creatively developed into banners using 2D techniques such as printmaking.

Learners will be introduced to, and need to be made aware of, the health and safety issues associated with the techniques and processes for the unit.

Learning outcomes

On completion of this unit a learner should:

1 Be able to use 2D mark-making techniques

2 Be able to communicate design ideas using 2D visual communication techniques

3 Be able to use formal elements in 2D visual communication.

Unit content

1 Be able to use 2D mark-making techniques

2D mark making: disciplines eg drawing, painting, photography, printmaking, digital (drawing, painting, manipulating)

Techniques: general eg touch, control, style, method, procedure, facility; specific eg drawing (stipple, smudge, sgraffito), painting (blend, wash, scumble), digital (clone, transform), printmaking (etch, silkscreen), photography (dodge, focus)

Recording: from primary sources; natural environment eg plants, humans, animals, insects, shells, landscapes; made environment eg architecture, artefacts, street furniture, galleries, exhibitions, museums; secondary sources eg magazines, journals, video, film, internet, printed material, CD ROM

Health and safety: Health and Safety Act of 1974; elimination of risk to self and others; thinking and working safely within a studio environment; following COSHH guidance on materials and workshop practice

2 Be able to communicate design ideas using 2D visual communication techniques

Communicate: eg response, selected themes, assignment briefs, audience, consumer, client, end user

Design ideas: eg sketches, thumbnails, plans, patterns, series, visualisation, texts, layouts, patterns, diagrams

Final design ideas: eg finished paintings, drawings, prints, screen-based images

3 Be able to use formal elements in 2D visual communication

Formal elements: line eg contour, cross-hatch; tone eg shadow, contrast; colour eg hue, tint, value, additive, subtractive; form eg linear, shaded; shape eg regular, irregular; texture; scale; angle; proportion

Materials: eg drawing (tools, graphite, charcoal, crayon, ink, pastel, papers, surfaces), painting (gouache, inks, oil, acrylic, watercolour, brushes, pigments, medium, supports), printmaking (lino, foam, card, mesh, engraving, inks, press), digital (screens, projector, tablet, tablet, stylus, scanner, sensor, camera, touch-sensitive, printers), photography (camera, lens, printer, papers, screen, sensor, photo sensitive emulsion)

Disciplines: eg drawing, painting, printmaking, photography; digital media

2D visual communication: appearance eg shape, colour, texture, surface, composition, marks, uniformity, contrast, edges; content eg subject, focus, layout

Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

Assessment and grading criteria					
To achieve a pass grade the evidence must show that the learner is able to:		**To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:**		**To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:**	
P1	demonstrate use of 2D mark-making techniques safely when working from primary and secondary sources [IE, CT]	**M1**	demonstrate consistent and effective use of 2D mark-making techniques when working from primary and secondary sources	**D1**	demonstrate imaginative and independent use of 2D mark-making techniques, when working from primary and secondary sources
P2	communicate design ideas using 2D visual communication techniques [CT, RL]	**M2**	communicate ideas effectively and consistently using 2D mark-making techniques	**D2**	communicate ideas imaginatively and independently using 2D mark-making techniques
P3	use formal elements in 2D visual communication. [IE, CT, EP]	**M3**	explain the use of formal elements in 2D visual communication.	**D3**	evaluate the use of formal elements in 2D visual communication.

PLTS: This summary references where applicable, in the square brackets, the elements of the personal, learning and thinking skills applicable in the pass criteria. It identifies opportunities for learners to demonstrate effective application of the referenced elements of the skills.

Key	IE – independent enquirers	RL – reflective learners	SM – self-managers
	CT – creative thinkers	TW – team workers	EP – effective participators

Essential guidance for tutors

Delivery

For this unit learners should have access to appropriate 2D resources such as photography, printmaking, painting, drawing and digital.

The opportunity to collect information from primary sources through drawing, digital cameras, camera phones etc is also essential for the delivery of this unit. While work from primary sources may look rougher and more hesitant, learners should be encouraged to recognise it as highly valuable in encouraging their long-term visual skills development and more personal connection to assignments.

Through the delivery of this unit centres have the opportunity to introduce learners to a wide range of materials and techniques. Whilst most of the unit is studio based, opportunities need to be taken for visits to locations, exhibitions, galleries and museums.

Delivery should motivate and excite learners; planned in such a way that includes induction to materials and techniques followed by assignments that will allow for the application of skills. Integration with other units should be considered where possible.

During the induction period it is essential that:

- learners are made aware of the health and safety issues relating to media, materials, tools and equipment used. It is important that learners know how to reduce the risk to themselves and others by thinking and working safely with tools, materials and technology
- learners are introduced to materials and processes relevant to 2D processes, for example drawing, photography and printmaking.

Assignment briefs should be built around the learning outcomes to maximise the opportunities for achievement.

Learning outcomes 1, 2 and 3 are closely linked. For all three outcomes, the techniques and processes selected will depend on the equipment and materials available in each centre, but it is expected that learners will familiarise themselves with as broad a range as possible. Each medium and material has its own set of rules and methods for use. Learners will need to employ the correct techniques for using the media and materials they work with and understanding the potential of media and process. Artists and designers often experiment and try to find new ways of working. They sometimes break the rules in order to get unusual results and finishes.

Learning outcome 1 will be delivered primarily through studio work, learners should be given the opportunity to experience as many 2D techniques as possible. It is important that assignments stimulate learners and give them the opportunity to extend the skills they acquire and to recognise links between the various materials, techniques and disciplines.

It is important that primary and secondary sources are carefully considered and various methods for recording from primary and secondary sources are explored. This is an opportunity for learners to develop their understanding of historical and contemporary art, craft and design practices.

Learning outcome 2 will be delivered in studios. Learners will need to understand how to generate ideas using techniques developed for learning outcome 1 and communicate them using appropriate methods. Contextual information will be vital in building learners' understanding of methods employed by artists, craftspeople and designers. Ideas will need to be developed through sketching and experimentation with 2D techniques. Learners could revisit and rework earlier studies produced in the studio or on location. It may be found at this stage that further visits or focused observation studies or photographs will help to refine learners' 2D communication techniques.

Learning outcome 3: this is the opportunity for learners to demonstrate their understanding of the formal elements through practical outcomes. They will need to be encouraged to articulate the different ways in which line, for example, can be created through, on the one hand, charcoal and on the other, watery paint and long-haired brushes. Through activities such as this, learners can then go on to further distinguish and control the use of tone, paint density, mixtures of colour and different surfaces (smooth, textured, light, dark, coloured, dry, damp, wet) to further modify the quality of line. Learners could extend their study, exploring the use of line in photography, printmaking or digital media.

Learners should be encouraged to document, discuss and present their opinions on the use of formal elements by artists, designers and craftspeople in their work, as well as the use of such in their own development of 2D ideas.

When describing their work and the work of others, it is necessary that the correct technical terms are used.

Learners' design work and final design ideas need to be documented in detail in terms of: formal elements, design ideas, final ideas and evaluation.

For this unit to be delivered successfully it is recommended that visits to galleries, museums and exhibitions are embedded in the assignment brief.

Inviting design practitioners in specialist fields to discuss their working methods with learners will put this unit into a vocational context.

Outline learning plan

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments.

The outline learning plan demonstrates one way in planning the delivery and assessment of this unit.

Topic and suggested assignments/activities and/assessment
Introduction to the unit – whole class.
Lecture/class discussion: formal elements in art, design and crafts and use by practitioners – whole class.
Assignment 1: Recording from Observation for Print and Screen, Using Photography and Drawing Introduction, eg theme: trees. Workshops: using drawing materials and digital cameras for recording from the natural environment. Independent working – learners' recording of trees with drawings and photographs; develop drawings, paintings, photographs and digital images into a print design for the upholstery of a chair of their choice. Research, design ideas (referring to formal elements). Tutorials, guidance. Visual and verbal presentation for assessment.
Assignment 2: Application of Printmaking and Graphic Techniques Introduction to assignment, eg theme: typography. Induction to the print studio including health and safety – whole class.
Introduction to print and digital techniques and processes – whole class.
Application of print and digital techniques – short tasks – whole group.
Workshop: using primary and secondary sources for assignment. Independent working: research, design ideas (referring to formal elements); produce an A3 booklet demonstrating print techniques and a digital folder of graphic techniques. Tutorials, workshops, demonstrations, guidance. Visual and verbal presentation for assessment.
Assignment 3: Application of Photography Techniques Introduction to assignment, eg theme: people. Induction to the photography studio including health and safety – whole class.
Introduction to photography techniques: • camera • developing and/or digital processing and optimisation • application of photography techniques – short tasks – whole group.
Demonstrations of techniques, workshops. Independent research, design ideas (referring to formal elements); producing a series of photographs of people. Tutorials, guidance. Visual and verbal presentation for assessment.

Assessment

Evidence should include a range of studies and samples that have been chosen to show how skills have developed, together with an awareness of safe working practices. Learners will need evidence of working from both primary and secondary sources and should use both in the development of their work. Work from primary sources may be more limited in that conditions on location or from short poses give limited time for learners to create considered work but it is often more immediate and exciting than that produced from secondary sources. Learners are expected to show some skill in the use of various techniques, with some grasp of the distinctive visual vocabulary relevant to specific disciplines.

The correct terms for techniques and reference to formal elements should be evidenced in learners' work; this can be presented in a variety of ways, for example presentation to the group, annotations inside a sketchbook or evaluation report.

The assessor should be aware of using the correct method of assessment, for example portfolios, sketchbooks, samples and digital records of presentations given to the group.

For P1, learners should be able to demonstrate the use of 2D techniques and processes safely in the studio. Learners are expected to use a limited range of materials and technical skills. Work will be guided by tutors.

For P2, learners are required to communicate their ideas. Responses will be predictable yet will clearly show ideas development and process. Learners have to present their work from concept to outcome and show connections to the work of others. Responses will show some creativity and experimentation although opportunities to develop ideas will have been missed and technical and presentation skills will be limited.

For P3, the correct terms for techniques and reference to formal elements should be evidenced. This can be presented in a variety of ways, for example presentation to the group, annotations inside a sketchbook or an evaluation report. Comments and observations will be descriptive with some attempt to compare and contrast..

For M1, learners will demonstrate a stronger grasp of 2D mark-making techniques and application. The mark making will be better articulated and controlled. Tasks for the pass criteria should be the same as those used for the merit, however the learners' approach may be more experimental. Learners should be able to work to a timescale, with limited guidance to fulfil the set tasks.

For M2, a deeper understanding for the uses of 2D techniques and processes and formal elements will be evidenced in learners' work. This will be evident in the practical outcomes and in the way these outcomes are presented.

For M3, learners will need to show, through annotation and presentation of their work, how the use of formal elements can meet various requirements for 2D visual communication. for example through them beginning to develop capabilities in transferring skills across disciplines.

For D1 and D2, learners will demonstrate more in-depth skill in using 2D mark-making techniques and applications.

An imaginative approach will be evidenced through the independent development and communication of ideas. More confidence will be evident in working from primary sources. Effective use of 2D techniques will be evident, with a more individual approach to assignment briefs. Techniques will be applied more accurately and links across disciplines will be more fully explored. Presentation will be more effective and the work will be completed within the timescale.

For D3, learners' evaluations of techniques and formal elements will be of a high standard in terms of content and presentation. The focus (and presentation) of evaluations should, primarily, be visual, although annotation and/or spoken word will form part of the evidence. Evaluation of own and others' work will support progression and development, demonstrating learning and understanding.

Programme of suggested assignments

The table below shows a programme of suggested assignments that cover the pass, merit and distinction criteria in the assessment and grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Pearson assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1, P2, P3 M1, M2, M3 D1, D2, D3	Recording from Observation for Print, Using Photography and Drawing	A textile designer develops designs for fabric, to be used for chair upholstery.	**Research**: • photographs of trees • drawings • colour studies • (reference to formal elements). **Design development**: • ideas for fabric • experiments with printing techniques • (reference to formal elements). **Final printed fabric.** **Evaluation.** • All the above presented to the group for assessment using appropriate presentation techniques.
P1, P2, P3 M1, M2, M3 D1, D2, D3	Application of Printmaking and Graphic Techniques	Typographers produces a sample book for clients, showing possible treatments of type through print and screen-based processes.	A3 booklet with prints inside. Evaluation. Presentation to the group of completed work.
P1, P2, P3 M1, M2, M3 D1, D2, D3	Application of Photography Techniques	Photographer uses digital and/or film-based processes to create a photostory about people at a specific place.	Mounted up photographs – a minimum of six. Evaluation. Presentation to the group completed work.

Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

This unit forms part of the BTEC Art and Design sector suite. This unit has particular links with the following unit titles in the Art and Design suite:

Level 1	Level 2	Level 3
Explore Drawing	3D Visual Communication	Materials, Techniques and Processes in Art and Design
Explore Painting	Working with Graphic Design Briefs	Communication Through Art and Design
Explore Printmaking	Working with Photography Briefs	
Mixed Media	Working with Textiles Briefs	
	Working with Visual Art Briefs	

This unit also provides development opportunities for some of the underpinning skills, knowledge and understanding of the following National Occupational Standards:

CCSKills (Draft Design NOS, May 2009)

- DES1 Apply research on the history and theory of design to your own design activities
- DES2 Apply design industry knowledge to inform your own design work practice and work
- DES3 Use Critical Thinking Techniques in your design work
- DES5 Follow a design process
- DES7 Contribute to the production of prototypes, models, mock-ups, samples or test pieces
- DES8 Explore the use of colour in a creative environment
- DES9 Research, test and apply techniques for the design of products
- DES10 Create visual designs
- DES11 Provide written information in relation to your design work
- DES12 Make a presentation
- DES23 Create 2D Designs using a Computer Aided Design System.

Essential resources

Learners will need access to a range of media, materials, relevant tools and equipment. This includes materials such as a range of pencils of varying hardness, soft graphite sticks, erasers, putty rubbers, crayon, pastel, watercolours, acrylics, oils, papers, fabrics, printmaking equipment for relief printing, stencil printing, digital cameras, computers. Access to a collection of materials and artefacts for primary observation and suitable locations is also necessary.

A studio space for 2D experimentation and development of ideas is essential, with specialist facilities for workshops and materials.

A learning resource centre (for example a library) providing research materials such as books, publications and the internet should be available.

Employer engagement and vocational contexts

Centres should develop links with practising artists, craftspeople and designers, to deliver assignments to learners or to provide work experience.

Links with employers are essential for the delivery of the programme, for work experience and for future employment.

Vocational learning support resources:

- Learning and Skills Network – www.vocationallearning.org.uk

Business and finance advice:

- local and regional Business Link – www.businesslink.gov.uk

Assignments should be vocationally relevant, centres should consider the delivery of 'live projects' for example to support the vocational content of the unit and programme.

Creative and Cultural Skills (www.ccskills.org.uk), the sector skills council for design have launched the web portal Creative Choices (www.creative-choices.co.uk). This portal has a range of information about careers in the design sector, including job descriptions.

Indicative reading for learners

Textbooks

Barber B – *The Complete Book Of Drawing: Essential Skills For Every Artist* (Arcturus Foolsham, 2004) ISBN 978-0572030445

De Sausmarez M – *Basic Design: The Dynamics of Visual Form* (Herbert Press Ltd, 2007) ISBN 978-0713683660

Edwards B – *The New Drawing on the Right Side of the Brain* (HarperCollins, 2001) ISBN 978-0007116454

Merrifield M P – *Light And Shade: A Classic Approach To Three Dimensional Drawing* (Dover, 2005) ISBN 978-0486441436

Perrella L – *Artists' Journal and* Sketchbooks: *Exploring and Creating Personal Pages* (Rockport, 2007) ISBN 978-1592530199

Simpson I – *Drawing Seeing and Observation* (A&C Black, 2003) ISBN 978-0713668780

Wilcox M – *Blue and Yellow Don't Make Green* (School Of Colour, 2002) ISBN 978-0967962870

Resource packs

Adams E and Weiner J – *Drawing Attractions: Drawing Attractions, Drawing Insights, Drawing On-Sites, Drawing Inspiration, Drawing in Action, Drawing Practicalities* (NSEAD, 2006)

Websites

www.adobe.com	Art and design software
www.campaignfordrawing.org/home/index.aspx	The Campaign for Drawing website
www.drawingroom.org.uk/intro.htm	The website of a gallery dedicated to contemporary drawing
schools-wikipedia.org/wp/d/Drawing.htm	Online encyclopedia definition of drawing

Delivery of personal, learning and thinking skills

The table below identifies the opportunities for personal, learning and thinking skills (PLTS) that have been included within the pass assessment criteria of this unit.

Skill	When learners are …
Independent enquirers	carrying out visual research from primary and secondary sources using 2D techniques
Creative thinkers	demonstrating an understanding of 2D techniques through the generation of ideas relevant to the assignment brief
Reflective learners	reviewing the development of design ideas, acting on outcomes as appropriate evaluating experiences and learning to inform future progress
Effective participators	identifying the influences of historical and contemporary art and design developments presenting the work to peers and tutors.

Although PLTS are identified within this unit as an inherent part of the assessment criteria, there are further opportunities to develop a range of PLTS through various approaches to teaching and learning.

Skill	When learners are …
Independent enquirers	evaluating work, demonstrating the use of formal elements with reference to techniques and processes; final outcomes
Creative thinkers	developing ideas with reference to 2D materials and techniques. pesentation of ideas: research, development and final outcomes
Reflective learners	setting goals with success criteria for their development of work
Self-managers	organising time and resources, prioritising actions
Team workers	collaborating with others to produce final outcomes.

Functional Skills – Level 2

Skill	When learners are …
ICT – Use ICT systems	
Select, interact with and use ICT systems independently for a complex task to meet a variety of needs	researching secondary sources relevant to the assignment brief
ICT – Find and select information	
Select and use a variety of sources of information independently for a complex task	finding illustrative materials to support the development of design ideas using 2D techniques and processes
Access, search for, select and use ICT-based information and evaluate its fitness for purpose	researching 2D visual communication techniques of artists and designers
ICT – Develop, present and communicate information	
Enter, develop and format information independently to suit its meaning and purpose including: • text and tables • images • numbers • records	presentation of research, design ideas and final pieces
English	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	presenting work: research, development and final design ideas
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	analysing different types of primary and secondary research material
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	annotating to support research collected, design development and final ideas in response to formal elements materials and techniques giving an evaluation.

Unit 4: 3D Visual Communication

Unit reference number: R/502/4824
Level 2: BTEC First
Credit value: 5
Guided learning hours: 30

Aim and purpose

The aim of this unit is to enable learners to learn about three dimensional (3D) visual communication techniques, through processes such as construction, modelling, carving and casting.

Unit introduction

Skills in 3D visual communication are necessary for artists, designers and craftspeople because they allow them to communicate the development of ideas in 3D with reference to the use of materials, techniques and formal elements; and to produce final pieces, for example products, furniture and sculpture.

It is recommended that learners are introduced to 3D materials, for example wood, metal, ceramics, plaster, glass, plastics and card, and techniques and processes through an individual workshop induction. The induction could be followed by assignments that allow the application of skills, to design, construct and produce 3D pieces. These could include automata, mobiles, packaging, flexigons, paper manipulation, wire or card constructions, installations made from cardboard that use tessellation, and pop-up books.

Learners will need to be made aware of the health and safety issues associated with the techniques and processes in this unit, for example safe workshop practices. The appropriate Control of Substances Hazardous to Health (COSHH) guidance should be followed at all times.

Learning outcomes

On completion of this unit a learner should:

1 Be able to use 3D making techniques

2 Be able to communicate design ideas using 3D visual communication techniques

3 Be able to use formal elements in 3D visual communication.

Unit content

1 Be able to use 3D making techniques

3D making techniques: eg cutting, joining, shaping, forming, carving, weaving, 3D digital techniques, model-making, experiments, finished pieces, laminating, fusing, casting, slotting, piercing, sanding, polishing, finishing

Recording: from primary sources; natural environment eg plants, humans, animals, insects, shells, landscapes; made environment eg architecture, artefacts, street furniture, galleries, exhibitions, museums; secondary sources eg magazines, journals, video, film, internet, printed material, CD ROM

Health and safety: Health and Safety Act 1974; elimination of risk to self and others; thinking and working safely within a work-shop environment; following COSHH guidance on material and workshop practice

2 Be able to communicate design ideas using 3D visual communication techniques

Communicate ideas: response to themes; assignment briefs; materials sampling eg model-making, maquettes, handling artefacts; investigating eg making processes, material properties, test runs; presentation eg working drawings, design sheets, onscreen, scale models, sketchbooks, feedback

Development: forms eg cylinder, cube, rhombus

Design ideas: eg card models, maquettes, test pieces, experiments, materials

Final design ideas: eg finished sculptures, models, artefacts, digital files

3 Be able to use formal elements in 3D visual communication

Formal elements: line; tone; colour; form; shape; texture; proportion; volume

Use formal elements: eg line (wire sculpture) tone (dyed fabrics, ceramic firing), colour (glazes, stained glass), form (pinch pots), shape (card sculptures, plastics); texture (stone carving), proportion (scale models, human figure), volume (inflatables, containers)

Materials: 3D non-resistant materials eg wet plaster, card, paper, string, wire, fibres, string Mod roc, papier mache, clay, foam, textiles; 3D resistant materials eg hard woods, soft woods, plywood, MDF, metals, plastic, glass, dry plaster, composites, sheet materials

Techniques: eg construction processes, cutting, carving, forming, moulding, weaving, joining, assembly, CAD/CAM, finishing processes

3D visual communication: presence eg volume, spatial, sound absorption, tactile quality, weight, ergonomics, softness, structure, scale, presentation; content eg subject, parts

Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

Assessment and grading criteria					
To achieve a pass grade the evidence must show that the learner is able to:		**To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:**		**To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:**	
P1	demonstrate use of 3D making techniques safely when working from primary and secondary sources [IE, CT]	**M1**	demonstrate consistent and effective use of 3D making techniques when working from primary and secondary sources	**D1**	demonstrate imaginative and independent use of 3D making techniques, when working from primary and secondary sources
P2	communicate design ideas using 3D visual communication techniques [CT, RL]	**M2**	communicate ideas effectively and consistently, using 3D making skills	**D2**	communicate ideas imaginatively and independently using 3D making techniques
P3	use formal elements in 3D visual communication. [IE, RL]	**M3**	explain the use of formal elements in 3D visual communication.	**D3**	evaluate the use of formal elements in 3D visual communication.

PLTS: This summary references where applicable, in the square brackets, the elements of the personal, learning and thinking skills applicable in the pass criteria. It identifies opportunities for learners to demonstrate effective application of the referenced elements of the skills.

Key			
	IE – independent enquirers	RL – reflective learners	SM – self-managers
	CT – creative thinkers	TW – team workers	EP – effective participators

Essential guidance for tutors

Delivery

This unit gives learners the opportunity to work with a wide range of 3D materials for the purpose of experimenting, developing and producing 3D pieces.

This unit should be delivered in the most appropriate workshops: for example, wood, metal and ceramics, with an induction schedule that covers the use of equipment with reference to materials, techniques and health and safety.

This unit should be linked with the others in the qualification to provide underpinning problem-solving and construction skills that can be extended in a broad range of disciplines; whether delivery is on its own or combined, it is important that attention is given to the content of the learning outcomes.

Learning outcome 1 will be delivered through specialist workshops (wood, metal, and ceramics); learners should be given the opportunity to experience a broad selection of appropriate and accessible techniques through which they can develop transferable skills. Learners should be taught to take into account health and safety procedures with reference to 3D processes specific to relevant workshops, for example, wood, metal and ceramics.

Assignments should stimulate and interest learners, as well as giving them the opportunity to develop 3D skills with reference to materials and techniques.

Learning outcome 2 will be delivered in workshops, using the appropriate machinery, tools techniques and processes with reference to materials, for example wood. Learners will need to understand how to generate and develop ideas using 3D processes acquired for learning outcome 1, and communicate them appropriately, for example maquettes, sketch models, scale models and final pieces.

Learners are encouraged to explore and experiment with the potential of 3D materials and to consider their source or manufacture, appropriate to the tasks set for induction and assignment briefs.

Learning outcome 3 will be delivered by applying 3D skills to design ideas and finished pieces. During this process it is essential that learners demonstrate an understanding of formal elements with reference to work produced, for example size, shape, form, function, pattern, including drawing for design, mood boards, working drawings, measuring and the technical language appropriate to the processes and techniques.

Learners should be encouraged to document, discuss and present their opinions on the use of formal elements, materials, techniques and processes with reference to their own work (development and final pieces).

Reference to the following will need to be made:

- formal elements
- design ideas
- materials
- techniques
- final pieces
- evaluation.

For the successful delivery of this unit it is recommended that the integration of 2D drawing skills are included.

Inviting design practitioners in specialist fields to discuss their working methods with learners, will put this unit into a vocational context.

Outline learning plan

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments.

The outline learning plan demonstrates one way in planning the delivery and assessment of this unit.

Topic and suggested assignments/activities and/assessment
Introduction to the unit – whole class.
Lecture/class discussion: formal elements in art, design and crafts and use by practitioners – whole class.
Assignment 1: Application of 3D Techniques Introduction to woodwork studio – health and safety – whole-class workshop.
Induction to machines/materials – whole class: • wood, plastic, string.
Class divides into two groups. Groups are given a set amount of materials each eg wire, wood, string, plastic. Task: To construct a structure using the materials given; learners must consider joinery, as no adhesives or fixings can be used. Demonstrate 3D skills. Gain inspiration from others' work. Making skills. Group presentation for assessment.
Assignment 2: Metalworking Theme – Body Adornment Introduction to metalwork studio – health and safety. Machines/materials – whole class.
Application of metalwork techniques – short tasks, whole group.
Research. Design ideas. Reference to formal elements. Gain inspiration from others' work. Using metals create a full-size piece of body adornment. Visual and verbal presentation for assessment. Independent working. Tutorials.

Topic and suggested assignments/activities and/assessment
Assignment 3: Ceramics Theme – Towers
Introduction to ceramics studio – health and safety – whole group.
Research.
Design ideas.
Reference to formal elements.
Gain inspiration from others' work.
Slab vessels based on towers.
Independent working.
Visual and verbal presentation for assessment.
Tutorials.

Assessment

For P1, learners will be able to demonstrate the use of 3D materials and techniques safely in the relevant workshops; along with the communication of ideas linked to their practical work.

Learners are expected to use some 3D making techniques when applying creative and development skills. They will be able to use the processes safely but may not always be fully effective across the techniques used.

For P2, learners should communicate ideas using making skills and evidence this through, for example: samples, experiments, maquettes and scale models. Ideas will be limited.

For P3, the correct terms for materials, techniques and reference to formal elements are evidenced in the learner's work; this can be presented in a variety of ways, for example annotations in sketchbooks, evaluation or presentation to the group.

The assessor should use the correct method of assessment of learners' work, which for the most part will be through practical outcomes, along with workshop logs, materials and tools lists and witness statements or digital records for group presentations.

For M1, learners will demonstrate a firm grasp of 3D making skills and application using appropriate materials and techniques.

For M2, learners will work with some guidance to show how 2D making skills can be used to develop design ideas and be presented using the most appropriate communication methods. The quality of the ideas may not match the quality of materials working.

Tasks set against the pass criteria for this unit can be the same as those for the merit criteria; however, the approach from learners will need to be more creative and experimental.

A deeper understanding of materials, techniques and processes and the use of formal elements will be evident in learners' work.

For D1 and D2, learners will demonstrate more independence and control in 3D making skills and application. Imaginative use of making skills will be evidenced through the creative use of materials, techniques and development of ideas and communication.

Learners will demonstrate, through the application of 3D skills, an individual approach to the assignments brief/s. Learners' descriptions of materials, techniques and formal elements will be of a high standard in terms of content and presentation.

For D3, learners' evaluations of techniques and formal elements will be of a high standard in terms of content and presentation. The focus (and presentation) of evaluations should, primarily, be visual, although annotation and/or spoken word will form part of the evidence. Evaluation of own and others' work will support progression and development, demonstrating learning and understanding, with accurate references to formal elements, development and communication of ideas.

Programme of suggested assignments

The table below shows a programme of suggested assignments that cover the pass, merit and distinction criteria in the assessment and grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Pearson assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1, P2 M1, M2 D1, D2	Application of 3D Techniques	A sculptor explores and applies a new technique.	Presentation of completed work to the group: • design development • completed piece.
P1, P2, P3 M1, M2, M3 D1, D2, D3	Body Adornment	A jeweller produces new work for a festival.	Presentation of completed work to the group: • research on the body • design development • completed piece – body adornment • reference to formal elements: design development, final piece.
P1, P2, P3 M1, M2, M3 D1, D2, D3	Ceramic Towers	A fine artist produces work inspired by urban environments.	Presentation of completed work to the group: • research on towers • design development • completed piece – ceramic vessel • reference to formal elements: design development, final piece.

Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

This unit forms part of the BTEC Art and Design sector suite. This unit has particular links with the following unit titles in the Art and Design suite:

Level 1	Level 2	Level 3
Explore 3D Design Crafts	2D Visual Communication	Materials, Techniques and Processes in Art and Design
Explore 3D Design	Working with Fashion Design Briefs	Ideas and Concepts in Art and Design
Explore 3D Design Fine Art	Working with 3D Design Briefs	
	Working with Visual Arts Briefs	
	Working with 3D Design Crafts Briefs	

This unit also provides development opportunities for some of the underpinning skills, knowledge and understanding of the following National Occupational Standards:

CCSKills (Draft Design NOS, May 2009)

- DES1 Apply research on the history and theory of design to your own design activities
- DES2 Apply design industry knowledge to inform your own design work practice and work
- DES3 Use Critical Thinking Techniques in your design work
- DES5 Follow a design process
- DES7 Contribute to the production of prototypes, models, mock-ups, samples or test pieces
- DES8 Explore the use of colour in a creative environment
- DES9 Research, test and apply techniques for the design of products
- DES10 Create visual designs
- DES11 Provide written information in relation to your design work
- DES12 Make a presentation
- DES24 Create 3D Models using a Computer Aided Design System.

Essential resources

Learners will need to have access to a range of materials, techniques and processes relevant to 3D.

Workshops might include wood, ceramics and metal, depending on the specialist areas available

A studio space for experimentation and development of ideas is essential. Adequate space for the storage of work in progress and completed pieces should be made available.

Learners should have access to a learning resource centre (for example a library), providing research materials such as books, publications and the internet.

Employer engagement and vocational contexts

Centres should develop links with local business, industry and practising artists, craftspeople and designers to support the vocational content of the unit and programme.

Links with employers are essential to the delivery of the programme: work experience, employment.

Vocational learning support resources:

- Learning and Skills Network – www.vocationallearning.org.uk

Business and finance advice:

- local and regional Business Link – www.businesslink.gov.uk

Assignments should be vocationally relevant; centres should consider the delivery of 'live projects', for example to support the vocational content of the unit and programme.

Creative and Cultural Skills (www.ccskills.org.uk), the sector skills council for design have launched the web portal Creative Choices (www.creative-choices.co.uk). This portal has a range of information about careers in the design sector, including job descriptions.

Indicative reading for learners

Textbooks

Byars M – *New Chairs – Innovations in Design, Technology And Materials* (Chronicle Books, 2006) ISBN 978-0811853644

Eldershaw J – *Junk Jewellery: 25 Extraordinary Designs To Create From Ordinary Objects* (Crown, 2008) ISBN 978-0307405173

Fiell C – *Design for The 21st Century* (Taschen GMBH, 2003) ISBN 978-3822827796

Hosaluk M – *Scratching The Surface: Art and Content In Contemporary Wood* (North Light Books, 2002) ISBN 978-1893164154

Hudson J – *1000 New Designs and Where To Find Them: A 21st Century Source book* (Laurence King Publishing, 2006) ISBN 978-1856694667

Lefteri C – *Materials for Inspirational Design* (RotoVision, 2006) ISBN 978-2940361502

McCreight T – *The Complete Metal Smith: Illustrated Handbook* (Davis Publications, 1991) ISBN 978-0871922403

Merrifield M P – *Light and Shade: A Classic Approach to Three Dimensional Drawing* (Dover, 2005) ISBN 978-0486441436

Triplett K – *Handbuilt Ceramics* (Lark Books, 2008) ISBN 978-1579901844

Resource pack

Adams E – *Space and Place* (NSEAD, 2004)

Websites

www.designfactory.org.uk	A crafts and design development agency based in the East Midlands
www.designnation.co.uk	The website of the Design Trust
www.ecodesign.co.uk	Architecture practice specialising in low energy design
www.henry-moore-fdn.co.uk	The Henry Moore Foundation
www.huddersfield3d.co.uk	A design exhibition centre for product and transport design students

Delivery of personal, learning and thinking skills

The table below identifies the opportunities for personal, learning and thinking skills (PLTS) that have been included within the pass assessment criteria of this unit.

Skill	When learners are …
Independent enquirers	evaluating work produced, demonstrating the use of formal elements with reference to 3D designs and final outcomes
Creative thinkers	demonstrating an understanding of 3D techniques and processes through the development of ideas relevant to the assignment brief
Reflective learners	reviewing the development of design ideas, acting on outcomes as appropriate.

Although PLTS are identified within this unit as an inherent part of the assessment criteria, there are further opportunities to develop a range of PLTS through various approaches to teaching and learning.

Skill	When learners are …
Independent enquirers	identifying questions to answer and problems to resolve with reference to the assignment brief
Creative thinkers	developing ideas with reference to 3D materials and techniques presenting ideas: research, development and final outcomes
Reflective learners	setting goals with success criteria for their development evaluating experiences and learning to inform progress
Team workers	collaborating with others to produce final outcomes. Collaborating with others to produce final outcomes
Self-managers	organising time and resources, prioritising actions.

Functional Skills – Level 2

Skill	When learners are …
ICT – Use ICT systems	
Select, interact with and use ICT systems independently for a complex task to meet a variety of needs	researching secondary sources relevant to the assignment brief
ICT – Find and select information	
Select and use a variety of sources of information independently for a complex task	finding illustrative materials to support the development of design ideas using 3D techniques and processes
ICT – Develop, present and communicate information	
Enter, develop and format information independently to suit its meaning and purpose including: • text and tables • images • numbers • records	presenting research, design ideas and final pieces
Mathematics	
Understand routine and non-routine problems in a wide range of familiar and unfamiliar contexts and situations	scaling timing measuring perspective
Identify the situation or problem and the mathematical methods needed to tackle it	
English	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	presenting work collected: research, development of ideas and final design ideas
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	analysing different types of primary and secondary research materials
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	annotating to support research collected, design development and final design ideas in response to formal elements, materials and techniques presenting an evaluation.

Unit 5: Using Ideas to Explore, Develop and Produce Art and Design

Unit reference number: Y/502/4825
Level 2: BTEC First
Credit value: 10
Guided learning hours: 60

Aim and purpose

The aim of this unit is to enable learners to apply ideas to develop skills and knowledge in an art and design project proposal that they have constructed themselves. Learners will do this by carrying out research, development and generation of final design ideas relative to an art and design pathway such as graphics, textiles or 3D.

Unit introduction

For successful completion of this unit, learners are required to have an understanding of the differences that exist between assignments. Art and crafts briefs are generally open ended with an emphasis on materials and techniques and the way they are applied. Design briefs meet the specific needs of the client, in some detail. In all cases, they will need to develop a focused project within a given timescale.

Exploring, developing and producing art, craft and design ideas are processes important to artists, designers and craftspeople when working on specific briefs. This unit brings together all the skills and techniques acquired by learners on the programme.

The assignment has four areas that need to be evidenced and worked on for this unit:

- Analysis of the project brief: learners will need to demonstrate an understanding of the assignment brief; it is important that through this understanding, adequate research will be collected to support the development of ideas.
- Research appropriate information: an understanding on how to research information to support the development of ideas is essential here. Access to primary and secondary sources will form the basis of research; historical and contemporary contextual research will provide essential information to inform and inspire the development of ideas. Learners will need to demonstrate an understanding of the assignment brief; it is important that through this understanding, adequate research will be collected to support the development of ideas.
- Generating and developing ideas: materials, techniques and processes will vary according to the specialist area of study, for example graphics, 3D fashion, etc. Learners will need to produce 2D and/or 3D prototypes, models, mock-ups, samples and test pieces to support the development of ideas and ensure that ideas will work in practice.

- Final design idea: through research and development, learners are required to produce and communicate the main features of their project proposal, effectively with reference to their specialism. Learners will need to produce an evaluation of their final outcome and development in response to the brief using the correct technical terms. Learners' progress and ongoing review of work needs to be documented using the most appropriate methods, for example visual diary, annotations in sketchbooks or design sheets.

Learning outcomes

On completion of this unit a learner should:

1 Be able to research and record visual and other information from primary and secondary sources in response to the brief

2 Be able to develop ideas that meet the requirements of the brief, through the use of specialist materials, equipment and techniques

3 Be able to present and communicate developmental work and final outcomes

4 Know the strengths and weaknesses of developmental work.

Unit content

1 Be able to research and record visual and other information from primary and secondary sources in response to the brief

Primary sources (varying depending on the brief): recording eg drawing, painting, photography, video, objects, places, people, galleries, exhibitions, museums

Secondary sources (varying depending on the brief): recording eg drawing, painting, photography, video, digital-technology, paper-based and online publications, commercial products, audio-visual sources

Record: eg photographs, mood boards, sketches, notes

Respond: clarify brief; identify requirements eg information, limitations, constraints, needs of clients, users, audience, technical possibilities, success criteria

Brief: eg centre-based, interpretation, specialist area

2 Be able to develop ideas that meet the requirements of the brief, through the use of specialist materials, equipment and techniques

Requirements of the brief: eg analyse, clarify, inspiration, ideas

Developing ideas: eg 'thinking on paper', modelling with materials; applying research; generating initial ideas; review; development; evaluation; refinement; appropriate ideas; prototypes; final design

Specialist materials, equipment and techniques: (varies depending on specialism) eg plans, working drawings, 2D, 3D, development, sketches, video

3 Be able to present and communicate developmental work and final outcomes

Present work: initial research; progression; design ideas; final design; selecting specialist techniques; presentation format eg exhibition display, portfolio

4 Know the strengths and weaknesses of developmental work

Strengths and weaknesses: sources eg reasons, inspiration; successes eg rejected ideas, problems, solutions; initial ideas eg familiarity, unfamiliarity, taking different directions, creative risks, knowledge of processes; final outcome

Developmental work: communication eg to individuals, to a group, face to face, remotely; communication methods eg display, digital presentation, journal, blog, sequence, layout; approaches eg timescales, alternative solutions, ideas

Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

Assessment and grading criteria					
To achieve a pass grade the evidence must show that the learner is able to:		**To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:**		**To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:**	
P1	research and record visual and other information from primary and secondary sources in response to the brief [IE]	**M1**	research and record a variety of visual and other information from primary and secondary sources in response to the brief	**D1**	research and record diverse visual and other information from primary and secondary sources in response to the brief
P2	develop ideas that meet the requirements of the brief, through the use of materials, techniques and processes [CT, RL]	**M2**	develop alternative ideas that meet the requirements of the brief, using a range of materials, techniques and processes	**D2**	develop selected alternative ideas, imaginatively meeting the requirements of the brief with the use of specialist materials, techniques and processes
P3	present and communicate developmental work and final outcomes to meet the brief [RL]	**M3**	present and communicate coherent developmental work and final outcomes effectively	**D3**	present and communicate diverse developmental work and final outcomes imaginatively
P4	identify the strengths and weaknesses of the work in terms of meeting the requirements of the brief using appropriate technical terms. [RL]	**M4**	explain the strengths and weaknesses of the work in terms of meeting the brief requirements, using technical terms consistently and accurately.	**D4**	analyse the strengths and weaknesses of the work in terms of meeting the requirements of the brief.

PLTS: This summary references where applicable, in the square brackets, the elements of the personal, learning and thinking skills applicable in the pass criteria. It identifies opportunities for learners to demonstrate effective application of the referenced elements of the skills.

Key			
	IE – independent enquirers	RL – reflective learners	SM – self-managers
	CT – creative thinkers	TW – team workers	EP – effective participators

Essential guidance for tutors

Delivery

Work for this unit should be based on a brief devised by the centre, with scope for interpretation by the individual learner.

The brief should encourage learners to develop their research skills, and to explore and realise ideas creatively, through design development, problem solving, analysis and regular reviews and tutorials.

Learners should be encouraged to analyse their progress in developing ideas by making notes on what works well or not and why.

Learners will need to learn how to analyse the brief and write it up in their own words as a 'project proposal' with guidance from their tutors.

Learners should be encouraged to visit galleries, exhibitions and art, craft, design studios to support research and development with reference to the unit. Research is an important part of this unit, as it will form the basis for design development.

Use of primary and secondary sources will play an essential part here in encouraging exploratory ideas and providing information and inspiration. Learners will be required to draw on skills, techniques and processes acquired form other units in the qualification to support the realisation of ideas for this unit.

2D and 3D development work must be presented in the most appropriate manner relative to the design specialism; this may be used for presentation and assessment.

Learning outcome 1: covers the research and recording of information. Learners should access a range of primary and secondary sources with access to high quality visual and audio materials such as books magazines, video, film, the internet etc; visits to locations, workshops, studios, galleries, exhibitions and museums. Research collected should be relevant to the project proposal devised by the learner.

Learning outcome 2: with the support of tutors, learners will develop their individual responses to the project proposals. Learners are encouraged to experiment with ideas, exploring different possibilities creatively and imaginatively before developing the final idea, using planning notes, roughs, sketchbooks and mind mapping.

Learning outcome 3: learners will need to demonstrate clear and effective communication of their design ideas and final outcome. It is essential that learners communicate the final idea in a professional manner, using the most appropriate 2D and 3D visual aids.

Learning outcome 4: covers evaluation and analysis of learners' work. Methods of delivery consist of discussion and presentation to the group and one-to-one guidance with tutors. Learners are required to demonstrate how they developed design ideas using the correct technical terms. Analysis of strengths and weaknesses is essential here; regular guidance and review will support this process.

This unit allows learners to demonstrate the skills and knowledge they have acquired on the course.

The unit should celebrate the learner's development on the programme. Delivery should be integrated with one or more specialist units and completed at the end of the qualification.

Outline learning plan

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments.

The outline learning plan demonstrates one way in planning the delivery and assessment of this unit.

Topic and suggested assignments/activities and/assessment
Introduction to the unit – whole class
Assignment 1: 'Inside – Outside' Information provided on: • project theme • expected outcomes • methods of research and development that need to be followed • timescale for the assignment. Lecture/class discussion – whole class. Questions and answers.
Template provided to learners: • project proposal • work schedule. Learners complete project proposal and work schedule.
Learners present project proposals to the group: • class discussion • question and answers.
Learners begin collecting research for their project proposal (independent working). To include: • primary and secondary sources • trips: museums, galleries, exhibitions • studio work • one-to-one/group support from tutor. Learners work from a schedule they have planned and put together for the collection of research.
Presentation of research collected – whole group: • class discussion • question and answers • feedback: action plan given to learners for further development; feedback: action plan given to learners for further development
Learners begin development of design ideas: • experiments with materials and techniques relevant to the learners specialism • one-to-one/group support from tutor. Learners work from a schedule they have planned and put together for the development of design ideas.

Topic and suggested assignments/activities and/assessment
Presentation of design ideas – whole group: • design sheets • samples • maquettes • sketch models • feedback: action plan provided to learners for further development.
Development of final piece of work with reference to project proposal: • studio/workshop • one-to-one/group support from tutor where appropriate.
Lectures/class discussion questions and answers – whole class: • presentation techniques • presentation methods: verbal non-verbal communication • evaluation: success of work/strengths and weaknesses etc.
Completion of all work for final presentation/assessment. Guidance provided from tutor on what needs to be completed.

Assessment

The project proposal that learners complete for this unit will inform the final assessment along with practical work including planning, research, development of ideas and the final design idea.

Assessment should include a period of 10 hours' practical work under controlled conditions; this will allow for adequate access to specialist workshops, staffing and materials.

For P1, learners are required to carry out research from primary and secondary sources relevant to the brief proposal; reference must be made to what has been collected, more than one method may be used to collect research.

For P2 and P3, learners will demonstrate the development of design ideas using appropriate 2D and 3D materials and techniques; along with final design ideas.

Assessment may consist of a presentation to the class, a crit or peer assessment, along with supporting materials, for example design sheets.

Assessors need to be aware of the need to use the most appropriate assessment techniques, for example in the case of group presentations, witness statements would be needed.

For P4, learners will be expected to identify the strengths and weaknesses of their work with reference to the brief (project proposal). Use of appropriate technical terms must be evidenced in learners' work.

For M1, learners must demonstrate that they can research and record from a variety of appropriate primary and secondary sources in response to the brief. There should be some diversity in the sources. Often, more creative ideas result from sources that are not immediately connected. The sources may be presented by the tutor as starting points but the learner should be moving towards more independent working in the later stages of the unit.

Information collected should be well organised and refer to brief requirements.

M2 and M3 learners will develop alternative ideas and produce an effective outcome that meets the brief requirements. Some of the ideas chosen may be developed to a greater extent than others. Some ideas may relate more to the theme, while others may focus on creative use of the materials and processes.

Annotated design sheets, sketch models and samples will demonstrate how learners' chosen ideas might be realised to the final form; they will have met the requirements of the brief effectively in their careful and accurate selection of materials and techniques.

M4 learners are expected to analyse the strengths and weaknesses of their work effectively in relation to the brief requirements, using technical terms accurately and consistently.

In the first instance the evidence may be verbal (P4); but for merit criteria to be achieved, written or recorded work needs to be evidenced. More visual evaluations, with annotations in sketchbooks would be appropriate, writing frames for more sustained written pieces or onscreen presentations of visual records with voiceover may be used.

For D1, learners must independently research and record a diverse selection of information from primary and secondary sources in response to the brief. Learners should be increasingly involved in finding and investigating sources that cover many aspects of the theme.

For D2 and D3, the work will be similar to the merit criteria; however learners will demonstrate an imaginative and independent approach. Learners will show more control in selection of alternative design development ideas. Appropriate specialist methods and processes will be evident in the final piece, with skills and techniques used consistently and with some precision.

D4 requires learners to analyse how successful their work has been in meeting the brief requirements. They will demonstrate a good grasp of the process and be able to present their analysis with some imagination.

Assessment evidence can be the same for pass, merit and distinction criteria, however the quality of work, range of techniques and processes and level of independent working will determine the criteria achieved.

Assessors should ensure that learners present their work in the most suitable fashion relevant to the specialism, for example design sheets, presentation sheets, prototypes and group presentations; this should be carried in an organised and professional manner.

It is recommended that assessment methods are evidenced in the initial design brief.

Programme of suggested assignments

The table below shows a programme of suggested assignments that cover the pass, merit and distinction criteria in the assessment and grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Pearson assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1, P2, P3, P4 M1, M2, M3, M4 D1, D2, D3, D4	'Inside – Outside'	An artist/designer from a specialist field produces work for a thematic exhibition. Depending on the specialism, the work could take many forms, for example: • furniture • sculpture • painting • a series of prints • textile piece • a poster advertising the exhibition.	Presentation of the following to the group for assessment: • research • design development (experiments with materials, techniques relevant to project proposal) • final design (including presentation sheets) • evaluation (development and analysis of design ideas and final piece; strengths and weaknesses of design ideas and final piece.

Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

This unit forms part of the BTEC Art and Design sector suite. This unit has particular links with the following unit titles in the Art and Design suite:

Level 1	Level 2	Level 3
Explore Drawing	Working with Graphic Design Briefs	Ideas and Concepts in Art and Design
Explore Painting	Working with Photography Briefs	Communication Through Art and Design
Explore Printmaking	Working to Fashion Design Briefs	Community Art
Explore Mixed Media	Working with Textiles Briefs	
Explore and Create Surface Relief	Working with 3D Design Briefs	
Explore 3D Design Crafts	Working with Interactive Media Briefs	
Explore 3D Design	Working with Visual Art Briefs	
Explore 3D Fine Art	Working with 3D Design Crafts Briefs	
A Personal Project		

This unit also provides development opportunities for some of the underpinning skills, knowledge and understanding of the following National Occupational Standards:

CCSKills (Draft Design NOS, May 2009)

- DES1 Apply research on the history and theory of design to your own design activities
- DES2 Apply design industry knowledge to inform your own design work practice and work
- DES3 Use critical thinking techniques in your design work
- DES4 Communicate the importance of the design brief
- DES5 Follow a design process
- DES6 Work effectively with others in a creative environment
- DES7 Contribute to the production of prototypes, models, mock-ups, samples or test pieces
- DES8 Explore the use of colour in a creative environment
- DES9 Research, test and apply techniques for the design of products
- DES10 Create visual designs
- DES11 Provide written information in relation to your design work
- DES12 Make a presentation
- DES14 Explore the history and social impact of creativity and how it can influence your own design work
- DES18 Interpret the design brief and follow the design process
- DES32 Apply concepts and theories of creativity and innovation to your own design work
- DES38 Manage design realisation
- DES39 Manage a design project.

Essential resources

For this unit, learners should have access to resources and materials that allow them to achieve the outcomes of project proposals they have constructed relevant to their art, design or craft specialism.

Resources and materials include: fashion, textiles, interactive media, 3D design, graphic design, fine art, photography, moving image and design crafts. The *Essential resources* sections in the specialist units will provide more specific guidance.

A well-stocked learning centre (for example a library) with a range of art and design reference books, videos, journals, CD ROMs and access to the internet is necessary to support delivery of this unit.

Learners should be given the opportunity to attend visits to support primary research.

Workshops and studios should include current specialist machinery with relevant technical support allowing learners the opportunity to demonstrate their practical skills relevant to the assignment brief.

Further information can be sourced from essential resource sections found within the specialist units.

Employer engagement and vocational contexts

Centres should develop links with local business, industry and practising artists, craftspeople and designers to support the vocational content of the unit and programme.

Links with employers are essential to the delivery of the programme for work experience, employment.

Vocational learning support resources:

- Learning and Skills Network – www.vocationallearning.org.uk

Business and finance advice:

- local and regional Business Link – www.businesslink.gov.uk

Assignments should be vocationally relevant; centres should consider the delivery of 'live projects' for example to support the vocational content of the unit and programme.

Creative and Cultural Skills (www.ccskills.org.uk), the sector skills council for design have launched the web portal Creative Choices (www.creative-choices.co.uk). This portal has a range of information about careers in the design sector, including job descriptions.

Indicative reading for learners

Textbooks

Please refer to other units in the specification.

Websites

Please refer to other units in the specification.

Delivery of personal, learning and thinking skills

The table below identifies the opportunities for personal, learning and thinking skills (PLTS) that have been included within the pass assessment criteria of this unit.

Skill	When learners are …
Independent enquirers	planning and carrying out research relevant to theme and art, design or craft proposal
Creative thinkers	generating ideas and exploring possibilities relevant to project proposal.
Reflective learners	setting goals with success criteria for their development and work.

Although PLTS are identified within this unit as an inherent part of the assessment criteria, there are further opportunities to develop a range of PLTS through various approaches to teaching and learning.

Skill	When learners are …
Independent enquirers	carrying out research to support the development of design ideas
Creative thinkers	trying out alternatives or new solutions and following ideas through asking questions to extend their thinking
Reflective learners	reviewing progress, acting on the outcomes inviting feedback and dealing positively with praise, setbacks and criticism evaluating experiences and learning to inform progress
Self-managers	organising time and resources, prioritising actions.

Functional Skills – Level 2

Skill	When learners are …
ICT – Use ICT systems	
Select, interact with and use ICT systems independently for a complex task to meet a variety of needs	researching the work of artists, craftspeople or designers using a variety of sources including internet, CD ROMs and DVDs
ICT – Find and select information	
Select and use a variety of sources of information independently for a complex task	finding illustrative materials to support the development of art, craft and design ideas relevant to specialist subject areas and project proposals
ICT – Develop, present and communicate information	
Enter, develop and format information independently to suit its meaning and purpose including: • text and tables • images • numbers • records	presenting research and development work for example: • digital work journal • CD ROM • onscreen presentation
Mathematics	
Understand routine and non-routine problems in a wide range of familiar and unfamiliar contexts and situations	scaling timing measuring using perspective
Identify the situation or problem and the mathematical methods needed to tackle it	
English	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	presenting a: • project proposal • research • development • final ideas
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	analysing primary and secondary research material
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	writing up research work collected, for example as a result of gallery visits; or producing an evaluation of their final outcome in relation to their project proposal.

Unit 6: Contextual References in Art and Design

Unit reference number: J/502/4819
Level 2: BTEC First
Credit value: 10
Guided learning hours: 60

Aim and purpose

This unit aims to develop learners' ability to research and explore different aspects of art, craft and design from contemporary, historical and cultural sources. Learners will use their contextual understanding to inform and inspire their ongoing creative work. They will develop their skills of presentation through organising and displaying their research findings.

Unit introduction

Artists, designers and craftspeople need to keep up to date with contemporary and historical creative and cultural developments in order to communicate their ideas effectively. A large part of this revolves around the study of artworks but also includes social, political and technological developments and their impact on art, craft and design.

In this unit, learners will develop their skills of research across a wide variety of information and references, providing inspiration for originating and developing their own ideas. They will develop their understanding of how to select, organise and record relevant images and information. Learners will need to recognise ways in which their contextual research can help the development of their own practical skills in their ongoing studies. Learners will need to produce evidence of research from first-hand experience, where possible. This might involve working with professional practitioners and visiting galleries, museums and exhibitions. Learners will need to collate images from these and other sources such as books, DVD, CD ROMs, the internet and quality magazines and art journals. Learners will develop their ability to select and analyse contextual images and objects for different purposes to inform their own work.

When studying others' art, craft and design, learners will need to examine how artists use visual language, materials and media to communicate ideas. This unit builds on learners' knowledge, skills and understanding of mark-making and making skills developed in *Unit 2: 2D Visual Communication* and *Unit 3: 3D Visual Communication*. They will apply their understanding of the formal elements in analysing the work of others in order to recognise and record how artists, craftspeople and designers use visual language to communicate their ideas.

Learners will need to record their research through visual and written means. They will need to make appropriate selection from their research and exploratory studies. Careful consideration should be given to the display of learners' visual records and notes.

Through the study of different aspects of art, craft and design, this unit offers the opportunity to heighten learners' awareness of ethical, moral, social, cultural and environmental issues.

Learning outcomes

On completion of this unit a learner should:

1 Know the influences of historical and contemporary art and design developments

2 Be able to use historical and contemporary references to support research and development of own response

3 Be able to present information about the work studied in an appropriate format.

Unit content

1 Know the influences of historical and contemporary art and design developments

Influences: key movements; artists eg styles, schools and individuals; cultures (western, non-western, similarities, differences); historical; contemporary; selected works; wider context; creative production eg economic, social; materials; techniques; processes; formal elements eg communicating ideas, feelings; on own work; on the work of others

Historical art and design developments: eg exhibitions, museums, histories, journals, diaries, sketchbooks, documents, books, recordings

Contemporary art and design developments: eg current and recent exhibitions, shows, living artists, designers, craftworkers, events, galleries, visual environment, openings, reports, announcements, commissions, accounts, contracts, news stories, publications, Really Simple Syndication (RSS) feeds, blogs, journals, websites, online tutorials

2 Be able to use historical and contemporary references to support research and development of own response

References: primary sources eg original art works, paintings, prints, screen-based work, photographs, artefacts, gallery, workshop, visits, museums, visiting artists/professionals; secondary sources eg reproductions, copies, books, magazines, journals, internet

Recording: eg annotating, sketches, studies, own photographs; collecting ready-made visual images eg postcards, leaflets; interviewing people eg voice recording, video recording

Own response: use others' work to inform and develop own ideas; comment eg to artists' work, to influences, to ideas, approaches, techniques

3 Be able to present information about the work studied in an appropriate format

Present information: personal judgements; commentary; supporting evidence

About the work: eg background, biography, relevant details; creative production; materials; processes; formal elements; visual language eg communication, ideas, information, feelings, creative intention

Appropriate format: eg case study, annotated images in a file or sketchbook, oral presentation with visuals, video, website, blog, vlog, podcast

Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

Assessment and grading criteria					
To achieve a pass grade the evidence must show that the learner is able to:		**To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:**		**To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:**	
P1	list influences of historical and contemporary art and design developments [IE, EP]	**M1**	explain the influences of relevant historical and contemporary art and design developments	**D1**	analyse the influences of historical and contemporary art and design developments
P2	use contextual research to support the development of own response [IE, CT, SM]	**M2**	make connections between sources of contextual research to support the development of own response	**D2**	creatively connect contextual research to support the development of own response
P3	present relevant information about the work studied. [CT, RL, EP, TW]	**M3**	present coherently, information about the work studied.	**D3**	present imaginatively, individual insights about the work studied.

PLTS: This summary references where applicable, in the square brackets, the elements of the personal, learning and thinking skills applicable in the pass criteria. It identifies opportunities for learners to demonstrate effective application of the referenced elements of the skills.

Key	IE – independent enquirers	RL – reflective learners	SM – self-managers
	CT – creative thinkers	TW – team workers	EP – effective participators

Essential guidance for tutors

Delivery

The aim of this unit is to develop learners' understanding of the diversity of historical and contemporary practice in art, craft and design in the context of their ongoing practical work. Tutors will need to plan this unit so that learners understand the connections between the selected artists' images and their own practice. They will also need to ensure that learners experience a breadth of study into historical and contemporary movements and artists.

In order to maintain learners' interest, tutors are encouraged to use different approaches in delivering this unit. Lectures, discussions and seminar presentations alongside visits to galleries, exhibitions, sculpture parks, craft fairs, studios or workshops would all be suitable. Visiting expert speakers could add to the vocational relevance of the subject for the learner. Whichever delivery methods are used, tutors should endeavour to stimulate, motivate, educate and inspire.

In the introductory stages of this unit, learners might begin by researching the same artist, craftsperson or designer and discuss their findings with the group. There are many opportunities for group or team activities in delivering this unit, for example:

- themed research, where each group member explores a different aspect of a common topic, for example different individuals in a movement or period, approaches to the same subject matter or ways of working across different cultures. Learners can then share and discuss results
- planning and managing a visit from a local professional practitioner and identifying questions to ask them.

The learning for this unit should be integrated with the work for *Unit 2: 2D Visual Communication* and/or *Unit 3: 3D Visual Communication*. It will integrate well with other compulsory and specialist units,. Delivery of this unit at different times and stages of the course must be carefully planned and will have greater relevance if closely linked to practical themes and assignments, where reference to other artists and designers is made. Tutors should be aware of the need to track the relevant criteria of the units being covered. This is particularly important where witness statements are used to evidence the quality of learners' discussions or presentations of their findings.

Learners may need to be taught how to collect and record information. Many learners are skilled in using digital processes for the purpose of research and tutors need to exploit their learners' prior knowledge by creating opportunities for varied and interesting research methods. These will include using traditional recording from books and journals, interviewing professional practitioners live or by email or interacting through blogs, as well as using the internet to access a broad range of information. Ideally, learners should have access to a well-stocked learning centre with books and computers, DVD and CD ROM contextual material, from which to plan and build their investigations. Visiting contemporary exhibitions, artists' workshops and design studios will give learners insight into the approaches and use of media of practitioners in the vocational world. Learners should have access to the use of digital recording equipment to encourage them to record their investigations, discussions and developments for this unit.

Tutors will need to demonstrate meaningful ways of using contextual research. Downloading and copy/pasting must be demonstrated as useful only when supported by the learners' own comments, notes or annotations. Learners must be given opportunities and the confidence to contribute their own personal judgements when commenting on others' work. Tutors will need to demonstrate the value of independent thoughts and contributions, supported by sections of relevant and meaningful contextual material. It is expected that informal discussions and more formal presentations by learners be an essential teaching and learning tool for the delivery of this unit. Using digital video recording during discussions and presentations will help learners to develop their ability to use critical, analytical vocabulary.

Learners' contextual investigations will connect closely to their own developing practical art and design ideas. Influences from their contextual research will cover different aspects of their own work. These might include connections to the subject matter, or the use of formal elements or the media and techniques employed by the artist. Learners will be expected to describe and comment on how their own work has been influenced by the work they have studied. Constructive and consistent feedback sessions with both tutors and peers will be very helpful in teaching learners these skills.

Learners need to be taught how to present their research findings about artists, craftspeople and designers. The form of the presentation may vary and learners should be encouraged to provide clear, well-organised information and to think about interesting and creative ways of presenting their exploratory work. The work can be displayed in a sketchbook, on display sheets or boards, or by illustrated, oral and digital presentation.

Outline learning plan

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments.

The outline learning plan demonstrates one way in planning the delivery and assessment of this unit.

Topic and suggested assignments/activities and/assessment
Introduction to the unit – whole class: exploring the aims and requirements of the unit.
Assignment 1: Body Adornment
A series of structured lessons investigating the assignment:
• historical and contemporary body adornment, carnival costumes, tattoos, jewellery, tribal ceremonial costume
• learners given handouts and also take notes
• this activity followed by discussion and seminars
• learner-initiated study.
Assignment 2: Text and Image Analysis
Learners select a number of images for analysis.
Identifying different artists' and designers' use of materials, techniques, processes and formal elements.
Making notes on results of enquiry.
Independent working to analyse text and image and organise work.
Individual and group tutorials .
Assignment 3: Independent Contextual Study
Tutorial to agree focus, eg 'Textured Surfaces in Design Objects'.
Learner-initiated:
• evaluating artists' and designers approaches to their work
• discussing how these might inspire and influence their own practical ideas
• interim assessment and review of progress.

Topic and suggested assignments/activities and/assessment
Assignment 4: Influence on Own Work Reviewing research findings and use others' work to generate and develop own ideas.
Developing own practical work, experimenting with media and techniques, producing samples and maquettes.
Critical analysis – visual/verbal/written:
• analysing their own designs alongside their chosen contextual influenced through use of storyboards, worksheets, annotated sketches and notes
• explaining what contextual elements are useful to the development of own ideas and how they are incorporating them in their practical work • developing and refining practical work towards completion
• describing and commenting on what works well what doesn't and why
• how own work is being influenced; what improvements/modifications needed
• completing practical outcome.
Assignment 5: Learner-initiated Presentation
Exploring a range of presentation methods.
Tutorial guidance.
Planning and designing a presentation gathered from research and enquiry.
Presenting to the group in an appropriate format using verbal/written/visual means.

Assessment

To achieve a pass grade, learners will be expected to be able to identify the influences of historical and contemporary art and design developments. This may be achieved in a number of ways, for example by investigating key movements, schools, individuals and cultural differences through study of original artwork or by using suitable high quality visual materials. Influences may be identified in terms of style, subject matter, use of materials, processes, ideas, beliefs and formal elements. Learners at this level are expected to cover a breadth of contextual imagery but not expected to study an extensive range.

Learners will be guided in their exploration of others' work to use as inspiration in developing their own work. They will generate ideas and develop a direct personal response. Learners should keep an illustrated record of their research notes to support this work. They will need to be taught how to efficiently and constructively collect and record this information and tutors can employ a number of methods to demonstrate this, using a variety of media.

Assessment is usually based on written information. However if learners struggle to communicate effectively in writing, then their ability to talk about what they can see and understand about the work should be taken into account. This could be achieved through presentations to the group, using witness statements or observation record sheets, as well as within annotated sketches or worksheets as part of their practical project.

Learners need to be able to present their research findings clearly. Their visual information should be organised so that the assessor can understand what the learner is trying to achieve. Tutors will be expected to provide support and feedback in order to help learners to generate this evidence appropriately.

To achieve a merit grade, learners should be able to explain the influences of a variety of art and design developments from the past and present. Learners should be able to provide evidence of a deeper understanding of these influences. The annotated pictorial evidence gathered could form the basis of part of a written project or oral presentation. Explanation may include social and political reasons for the success and popularity of art and design movements, artefacts or persons.

Learners should be consistent in presenting well-organised and coherent, effective information about the work studied. Their presentations will be interesting and informative and include their own ideas about the work studied and how it was made. Learners will show skill in their use of visual and critical analysis of others' work. Assessment evidence for these criteria might take the form of a combination of written notes, annotated sketchbooks or contextual workbooks and worksheets and planned preparations for audiovisual presentations. This evidence should be, in part, a reflection of their own development of practical work in the context of other art, craft and design.

To further achieve a distinction grade, learners are required to analyse and connect information on the different influences of art and design developments from the past and present.

Learners will demonstrate a creative approach to set tasks and begin to take an independent approach to research and development of their ideas. They will be evidencing thoughtful personal judgements on relevant historical, cultural and contemporary references and in their own work, they will show informed understanding of visual language. Learners will be expected to effectively plan and present personal, imaginative and well-structured information about the work studied.

Programme of suggested assignments

The table below shows a programme of suggested assignments that cover the pass, merit and distinction criteria in the assessment and grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Pearson assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1, P2, P3 M1, M2, M3	Body Adornment	Craftworkers producing material for a carnival.	Assessment methods might include: 1 Using witness statements to: ◊ observe and record learner activity and their progress while working ◊ record learners' discussions with groups and ability to communicate at tutorials ◊ observe and record learner presentations 2 Reports of progress from work experience placements 3 Learner's own ongoing review of progress and self-evaluation evidenced through statements, notes and annotated sketchbooks/ worksheets 4 Evidence of visual studies from portfolio of ongoing and final work.
P1, P2, P3 M1, M2, M3	Text and Image Analysis	Writer researching different artists.	
P1, P2, P3 M1, M2, M3 D1, D2, D3	Independent Contextual Study	Designer analysing work of others.	
P1, P2, P3 M1, M2, M3	Influence on Own Work	Artist reflecting on own work.	
D1, D2, D3	Learner-initiated Presentation	Artist/designer presenting to gallery/ client.	

Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

This unit forms part of the BTEC Art and Design sector suite. This unit has particular links with the following unit titles in the Art and Design suite:

Level 1	Level 2	Level 3
Explore Drawing	2D Visual Communication	Visual Recording in Art and Design
Explore Painting	3D Visual Communication	Materials, Techniques and Processes in Art and Design
Explore 3D Design	Using Ideas to Explore, Develop and Produce Art and Design	Contextual Influences in Art and Design

This unit also provides development opportunities for some of the underpinning skills, knowledge and understanding of the following National Occupational Standards:

CCSKills (Draft Design NOS, May 2009)

- DES1 Apply research on the history and theory of design to your own design activities
- DES2 Apply design industry knowledge to inform your own design work practice and work
- DES3 Use Critical Thinking Techniques in your design work
- DES12 Make a presentation
- DES14 Explore the history and social impact of creativity and how it can influence your own design work
- DES15 Research and evaluate the nature of design in a specific industry context.

Essential resources

Learners will need to reflect on others' work and should be encouraged to link it to their own practical work in other units. This will help them to gain an understanding of the context they work in and to gain inspiration for further assignments. Evidence for assessment should aim to link practical visual work with written and verbal materials.

Learners should have access to learning centre resources, which should include broad coverage of historical, cultural and contemporary art, craft and design. Resources should include written and visual traditional and digital materials. The collection should be sufficient to enable learners to achieve the unit. Learners should also have access to relevant museums and galleries to study appropriate work first hand. Audiovisual and computer-aided equipment and software should be used where appropriate to support teaching and learning, for example CD ROM, DVD and the internet.

Since this unit is integrated with learners' ongoing practical work, coverage will include practical art and design resources such as access to studios, workshops and associated materials and equipment.

Employer engagement and vocational contexts

Centres should develop links with local business, industry and practising artists, craftspeople and designers to support the vocational content of the unit and programme.

Assignments should be vocationally relevant and centres should work with outside agencies to offer 'live' assignments to learners or to provide work experience.

Links with employers are essential to the delivery of the programme and for work experience and employment.

Vocational learning support resources:

- Learning and Skills Network – www.vocationallearning.org.uk

Business and finance advice:

- local and regional Business Link – www.businesslink.gov.uk

Learners should be regularly informed and updated on progression routes to further education and of job opportunities on completion of their course.

Creative and Cultural Skills (www.ccskills.org.uk), the sector skills council for design have launched the web portal Creative Choices (www.creative-choices.co.uk). This portal has a range of information about careers in the design sector, including job descriptions.

Indicative reading for learners

Textbooks

Duro P and Greenhalgh M – *Essential Art History* (Bloomsbury, 1994) ISBN 9780747514022

Fiell C and P – *Design of the 20th Century* (Taschen, 2005) ISBN 978-3822840788

Frayling C – *Art and Design* (Anova Books Collins and Brown, 1999) ISBN 9781855857254

Hauffe T – *Design:A Concise History* (Laurence King Publishing, 1998) ISBN 1856691160

Heartney E – *Art and Today* (Phaidon Press, 2008) ISBN 9780714845142

Heller N G – *Appreciating Art* (A&C Black Publishers Ltd Herbert Press) ISBN 9780713687309

Jervis S – *Penguin Dictionary of Design and Designers* (Penguin Books, 1989) ISBN NA7205 P48

LaGamma A – *The Essential Art of African Textiles: Design Without End* (Metropolitan Museum of Art New York, 2009) ISBN 9780300149623

Lynton N – *The Story of Modern Art* (Prentice Hall, 1991) ISBN TX 006142331

Munder H (editor) – *Art and Language* (JRP Editions, 2006) ISBN 9783905701562

Paul C – *Digital Art* (Thames & Hudson Ltd, 2008) ISBN 9780500203989

Pooke G and Newall D – *Art History* (Taylor and Francis Ltd Routledge, 2007) ISBN 9780415373081

Read H and Stangos N – *Dictionary of Art and Artists* (Thames & Hudson Ltd, 1994) ISBN 9780500202746

Rowland A – *Bauhaus Source Book* (Phaidon, 1990) ISBN Z370126379793

Rush M – *Video Art* (Phaidon Press Ltd, 2007) ISBN 9780500284872

Sarane A – *Surrealist Art* (Thames & Hudson Ltd, 1985) ISBN 9780500200971

Scharf A – *Art and Photography* (Penguin Books, 1990) ISBN 014013132

Sparke P – *Design in Context* (Bloomsbury, 1991) ISBN 0748408592

The 20th Century Art Book (Phaidon, 1999) ISBN 0714847984

The Art Book (Phaidon, 1998) ISBN 0714836257

Tufnell B – *Land Art* (Tate Publishing (UK), 2007) ISBN 9781854376046

Journals

Arts Monthly

Crafts magazine

Creative Design

Dazed and Confused

Design magazine

Websites

www.artscouncil.org.uk	The national development agency for the arts in the UK
www.artjournal.co.uk	An online guide to art books and exhibitions
www.axisweb.org	An online resource for contemporary art and artists
www.craftscouncil.org.uk	The national development agency for contemporary crafts in the UK
creativecommons.org	Creative Commons, dedicated to online sharing and collaboration of resources
www.design-council.org.uk	The national strategic body for design
www.designmuseum.org	The Design Museum
www.fashion-era.com/C20th_costume_history	Fashion website with illustrations of fashion, costume, clothing and social history
www.graphicdesignblog.co.uk	Blog run by freelance graphic designer
www.masters-of-photography.com	Articles, images and resources on photographers
www.movieola.ca/index.php	A website dedicated to short films
www.nsead.org/home/index.aspx	The National Society for Education in Art and Design
www.tate.org.uk	The Tate Gallery
www.vam.ac.uk	The Victoria and Albert Museum

Delivery of personal, learning and thinking skills

The table below identifies the opportunities for personal, learning and thinking skills (PLTS) that have been included within the pass assessment criteria of this unit.

Skill	When learners are …
Independent enquirers	identifying the influences of historical and contemporary art and design developments exploring historical and contemporary references in researching and developing own response
Creative thinkers	exploring historical and contemporary references in researching and developing own response presenting information about the work studied
Reflective learners	presenting information about the work studied
Team workers	presenting information about the work studied
Self-managers	exploring historical and contemporary references in researching and developing own response
Effective participators	identifying the influences of historical and contemporary art and design developments presenting information about the work studied.

Although PLTS are identified within this unit as an inherent part of the assessment criteria, there are further opportunities to develop a range of PLTS through various approaches to teaching and learning.

Skill	When learners are …
Independent enquirers	researching contextual information from different sources originating and developing ideas for practical work investigating presentation techniques
Creative thinkers	selecting and recording from contextual and other sources generating and developing design ideas connecting own ideas to contextual influences imaginatively using media and experimenting with techniques presenting work in interesting, imaginative and aesthetically pleasing ways
Reflective learners	planning and evaluating own work discussing and reviewing own progress and getting feedback presenting work
Team workers	discussing work at seminars and contributing to feedback at presentations working with group to plan, mount and exhibit work
Self-managers	working independently to research contextual references and develop their ideas planning the development of their work assessing their own work

Skill	When learners are …
Effective participators	participating in group discussions contributing to seminars planning and giving group presentations.

Functional Skills – Level 2

Skill	When learners are …
ICT – Use ICT systems	
Select, interact with and use ICT systems independently for a complex task to meet a variety of needs	researching contextual references for analysis of others' images and for use to inform own work scanning images to develop design ideas
Use ICT to effectively plan work and evaluate the effectiveness of the ICT system they have used	planning project briefs and where and how ICT might be used when appropriate evaluating outcomes
Manage information storage to enable efficient retrieval	researching from internet sources; downloading information; creating folders for storage and retrieval
Follow and understand the need for safety and security practices	undergoing induction period – introduction to the ICT centre and systems and working practices
ICT – Find and select information	
Select and use a variety of sources of information independently for a complex task	researching internet sources for a range of contextual material and from different sites, selecting from their research, developing own response informed by research
Access, search for, select and use ICT-based information and evaluate its fitness for purpose	researching information for different briefs and activities evaluating results
ICT – Develop, present and communicate information	
Enter, develop and format information independently to suit its meaning and purpose including: • text and tables • images • numbers • records	designing digitally; using scanners; inputting and formatting information from sources; use of software programmes for image development
Bring together information to suit content and purpose	collating research from different contextual sources together with own written work
Present information in ways that are fit for purpose and audience	creating a digital contextual studies folder; exploring appropriate presentation techniques
Evaluate the selection and use of ICT tools and facilities used to present information	assessing their progress and commenting on the appropriateness of their selection of ICT tools and facilities – eg use of software programmes
Select and use ICT to communicate and exchange information safely, responsibly and effectively including storage of messages and contact lists	using internet to email or access artists' blogs; email to submit written work; downloading information from internet sources; storage of information – creating folders for access

Skill	When learners are …
English	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	discussing the project brief; contributing to group discussions and the sharing of ideas; comparing visual qualities in selected contextual references in others' work; evaluating own studies; presenting to different audiences
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	researching, reading, selecting text and images; annotating, commenting and comparing; using text and image to relate to own work and evidencing understanding through discussion, evaluations and presentations
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	evaluating results of own ideas and analysing qualities in the use of formal elements and media, materials and techniques analysing and evaluating selected artists' images for the purpose of developing own work, using personal judgements; evaluating final ideas.

Unit 7: Building an Art and Design Portfolio

Unit reference number: H/502/4875
Level 2: BTEC First
Credit value: 5
Guided learning hours: 30

Aim and purpose

The purpose of this unit is to build an art and design portfolio, to act as a vehicle for supporting an application to employment or further study.

Unit introduction

To be successful in the art and design industry, practitioners need to be able to present themselves and their work in the most appropriate manner. In many cases this presentation will be in the form of a portfolio of carefully selected and edited art and design work. Formats can vary from paper-based examples of actual art and design work, printed outputs from computer-based work, showreels or DVD presentations of film, installation or animation, or animated sequences of 3D modelling. The portfolio can act as tool for demonstrating an individual's strengths, or to highlight their ability to work in a diverse range of disciplines, or use different media with success. Portfolios can be presented on websites as a way of attracting a larger audience.

In this unit learners will be taught the skills required to undertake the building of their portfolio. In doing this they will learn how to evaluate their work as a whole, and consider the strengths and areas for development in their work. They will learn how to select examples for inclusion in their portfolio, and develop understanding about setting criteria to help them make these judgements. The ability to present their examples to their fullest potential will also be explored, through learners considering the fitness for purpose of different presentation techniques.

As communication is such an important aspect of working in the art and design industry, learners will develop their ability to be able to explain their working practices and the aims in their work. The development of communication skills is likely to form an integral part of their career; this unit will provide them with a useful introduction to understanding and applying these skills. The knowledge learners gain can be applied to their application to employment or further study.

Learning outcomes

On completion of this unit a learner should:

1 Understand the purpose of an art and design portfolio

2 Be able to present an art and design portfolio.

Unit content

1 Understand the purpose of an art and design portfolio

Purpose: eg support an application for employment; support an application for further study; to highlight strengths in own work; demonstrate ability in a wide range of areas or disciplines; demonstrate specific technical skills; to highlight specialist skills relevant to career opportunity; establish pedigree of completed work or projects; provide evidence of published or exhibited work; show examples of design work in specific design briefs

Art and design portfolio: eg paper-based artwork, paper-based design work, material samples, photographic records or examples, DVD, video or web-based portfolios, animated sequences; supporting statements and CV

2 Be able to present an art and design portfolio

Evaluating: eg identify goals, evaluating own practical artwork, considering strengths and development areas

Selecting: eg deciding criteria for inclusion in portfolio; using feedback from others to assist in the selection process; editing examples

Presenting: eg cleaning, mounting and preparing art and design work; using frames; developing DVD or video-based portfolios; online or web-based portfolios; retaking photographic examples as required; developing onscreen presentations; producing a written statement to support practical work; writing CV

Explaining: eg articulating reasons for selection and rejection of work; providing rationale for presentation methods used; using written statements to provide information on content and interests; using information to support examples of work; explaining production methods in work

Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

Assessment and grading criteria					
To achieve a pass grade the evidence must show that the learner is able to:		**To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:**		**To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:**	
P1	describe how artists and designers use portfolios [IE]	**M1**	explain how artists and designers use portfolios, reaching consistent conclusions	**D1**	independently describe how artists and designers use portfolios, reaching informed and in-depth conclusions
P2	present an art and design portfolio [IE, CT, RL, SM]	**M2**	competently select and present examples of their work to produce an effective art and design portfolio	**D2**	independently select and present examples of their work to produce an exciting art and design portfolio
P3	justify reasons for selecting work for an art and design portfolio. [CT, RL, SM]	**M3**	consistently and effectively explain their reasons for selecting work for an art and design portfolio.	**D3**	independently and fluently explain their reasons for selecting work for an art and design portfolio.

PLTS: This summary references where applicable, in the square brackets, the elements of the personal, learning and thinking skills applicable in the pass criteria. It identifies opportunities for learners to demonstrate effective application of the referenced elements of the skills.

Key	IE – independent enquirers	RL – reflective learners	SM – self-managers
	CT – creative thinkers	TW – team workers	EP – effective participators

Essential guidance for tutors

Delivery

This unit can be delivered in two stages, as shown by the assignments in the outline learning plan.

The first assignment details a basic research task through which learners learn about the roles portfolios play in the art and design industry, it addresses learning outcome 1. The differences between some of the roles are quite subtle, but would nonetheless be useful to highlight. For example, where portfolios are used to support job applications they tend to be short and specific to the area or field; where portfolios are used to promote the individual to an agency, they may incorporate a wider band of areas or demonstrate abilities in a broad range of disciplines to widen the scope of potential commissions. The importance for learners of seeing examples of portfolios cannot be over-stressed. Tutors should present examples of their own portfolios (always a moment of significant interest for the learner group) as well as sourcing visits or presentations from local practitioners if possible. Online portfolios can be viewed and discussed. Learners should record as many examples of portfolios and uses as possible, and record the comments or reasons behind the scope in the portfolios by questioning the artist, craftspeople or designers directly if possible. This will inform their work in learning outcome 2.

In learning outcome 2 learners will go through the process of presenting their portfolio. The basis for the portfolio can be tailored to individual learner's aspirations – either employment or further study. In doing this, tutors can provide a very real situation which should give learners a valid reason for focusing their attention. Portfolios can be supported by a written statement, produced by learners to explain their areas of interests, ambitions and career goals. The exact nature of delivering this outcome will vary depending on the resources in the centre, but learners should be provided with ample space to spread out examples of their work. In assignment 2 this is achieved by dividing the group into pairs and providing each pair with an area and timespan in which to spread the work out and make the selection. Learners should make the initial evaluation and selection themselves, with tutors supporting this process by viewing their proposed inclusions and rejections and helping them to confirm their choices.

Once this has been achieved, learners can remove the surplus work and undertake cleaning, framing, mounting, and any computer-based activities involved with the presentation of practical work. Learners should be supported by appropriate technical assistance when framing/mounting examples, due to the high costs of the materials involved. Learners may also need access to specialist resources and supervision with photographing 3D, small-scale or large-scale pieces of 2D work. Tutors will need to agree the final format for presentations with learners, who will then present the portfolio and an accompanying supporting statement. This could be supported by the production of a CV, the construction of which could be delivered through a Functional Skills session. Learners should present their portfolios to the group, so that each example can be used to highlight strong examples of selection and presentation. Learners should evaluate and explain their reasons for their selection and the process of developing their portfolio. The unit can be concluded with the process of the mock interview itself – either for employment or for further study. If practitioners have been involved in the delivery it would be a real bonus if they could give time to be involved in these interviews.

Outline learning plan

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments.

The outline learning plan demonstrates one way in planning the delivery and assessment of this unit.

Topic and suggested assignments/activities and/assessment
Introduction to unit.
Assignment 1: Discussion and Research: How Are Portfolios Used in the Art and Design Industry? • Tutor presentation, discussion and research activities (including practitioner presentations/visits) (learning outcome 1). • Independent learner-based research and presentation. • Group discussion.
Assignment 2: Mock Interview: read through. Scenario to be used depends on learner aims – either an application and interview for employment or an interview for further education/higher level study. • Learners work in pairs to organise all aspects of work, evaluate and make initial selection. • Tutor feedback to pairs, via series of appointments/tutorials. • Learners select, prepare and mount work. • Individual learner presentations to group, showing portfolio and discussing rationale for selecting and rejecting examples of work. Notes for presentation to include a personal statement, passed out to all learners in audience (learning outcome 2). • Mock interview, with learner evaluation at close.
Group crit and assessment.

Assessment

Assessment of this unit can be achieved through tutor observation of learner performance, supported by learners' notes and records, and the quality of the practical portfolio produced.

For P1, learners should be able to list the ways in which artists and designers use portfolios in the industry. The range of applications will be limited.

For P2, learners will show an ability to be able to select work and undertake all the processes involved in producing their portfolio. Their choices may tend towards obvious examples, where the potential for inclusion of other aspects such as mounted preparatory work will be ignored.

For P3, learners will be able to explain their reasoning in a limited way. Choices will be justified and articulated but without extending the analysis in any great depth.

For M1, learners will be able to describe the ways that artists and designers use their portfolios with more depth. Analysis of examples in related areas such as graphic communication will be extended to consider the volume, type and purpose of each included item.

For M2, learners will be able to select the work for their portfolio with confidence. They will be able to evaluate the strengths and weaknesses in their work competently, and make considered judgements on what to include. The overall effect will be an effective portfolio of art and design work.

For M3, learners will effectively explain their rationale for choosing and rejecting work. Aspects such as running order of works, mounting techniques and volumes included will be clearly and effectively explained.

For D1, learners will be able to work independently in conducting their research into different applications

of art and design portfolios. The range of uses covered will be further extended than in work assessed at M1, and learners will be able to use their research to reach informed conclusions.

For D2, learners will be able to select work to produce and present a portfolio that is exciting and engages the audience. Work will be chosen independently and used creatively in the mounting and sequencing of the work. For D3, learners will be able to independently and fluently explain their rationale for selecting and rejecting examples. They will be able to relate their choices to the overall purpose of the portfolio and how they visualise it working to communicate the intentions to the audience.

Programme of suggested assignments

The table below shows a programme of suggested assignments that cover the pass, merit and distinction criteria in the assessment and grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Pearson assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1, M1, D1	How Are Portfolios Used in the Art and Design Industry?	Learners are undertaking background research to assist in the understanding and development of specific portfolios.	Portfolio of evidence consisting of: • examples of independent learner research • notes, annotations and visuals in learners' work journals or sketchbooks • learner discussion • presentation.
P2, M2, D2 P3, M3, D3	Mock Interview	Learner preparing for an interview for further study/employment.	Portfolio of evidence consisting of: • complete portfolio • notes, annotations and visuals in learners' work journals or sketchbooks • learner evaluation • presentation • written statement/CV.

Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

This unit forms part of the BTEC Art and Design sector suite. This unit has particular links with the following unit titles in the Art and Design suite:

Level 1	Level 2	Level 3
A Personal Project	Working in the Art and Design Industry	Professional Practice in Art and Design
		Personal and Professional Development in Art and Design
		Freelance Work in Art and Design

This unit also provides development opportunities for some of the underpinning skills, knowledge and understanding of the following National Occupational Standards:

CCSKills (Draft Design NOS, May 2009)

- DES1 Apply research on the history and theory of design to your own design activities
- DES2 Apply design industry knowledge to inform your own design work practice and work
- DES3 Use Critical Thinking Techniques in your design work
- DES4 Communicate the importance of the design brief
- DES5 Follow a design process
- DES9 Research, test and apply techniques for the design of products
- DES10 Create visual designs
- DES11 Provide written information in relation to your design work
- DES12 Make a presentation
- DES18 Interpret the design brief and follow the design process
- DES21 Articulate, present and debate ideas in a creative environment
- DES28 Developing your own design offer
- DES36 Develop and extend your design skills and practices.

Essential resources

This unit can be delivered as a studio-based series of exercises, supported by presentations from tutors and visiting practitioners. Off-site visits to practitioners can provide opportunities for learners to explore the content in more detail.

Access to general studios and adequate space to display and consider work will be important. Learners may also find visits to practitioners' studios and/or presentations from practitioners particularly useful. Library and internet access will also be required. Learners will need DTP/word-processing facilities when working up CVs or statements.

Employer engagement and vocational contexts

Practitioners can become engaged with this unit though presenting examples of their portfolios. Learners may also be able to visit design companies and/or galleries where designers and curators can explain how their websites were conceived in terms of content of work and intended communication.

Links with employers are essential to the delivery of the programme for work experience and future employment.

Vocational learning support resources:

- Learning and Skills Network – www.vocationallearning.org.uk

Business and finance advice:

- local and regional Business Link – www.businesslink.gov.uk

Creative and Cultural Skills (www.ccskills.org.uk), the sector skills council for design have launched the web portal Creative Choices (www.creative-choices.co.uk). This portal has a range of information about careers in the design sector, including job descriptions.

Indicative reading for learners

Textbooks

Mornement C – *Second Steps: A One-stop Resource for All Who Are Setting Up a Business in the Applied Arts* (BCF Books, 2006) ISBN 978-0955002625

Mosse K – *Writers' and Artists' Yearbook 2009* (A&C Black, 2008) ISBN 978-1408102640

Journal

The Artists Newsletter (www.a-n.co.uk)

Websites

www.artsjobfinder.co.uk	Information on jobs in the Arts
www.prospects.ac.uk	Graduate careers website

Delivery of personal, learning and thinking skills

The table below identifies the opportunities for personal, learning and thinking skills (PLTS) that have been included within the pass assessment criteria of this unit.

Skill	When learners are …
Independent enquirers	investigating how artists and designers use portfolios using research evidence to support conclusions
Creative thinkers	generating ideas about their portfolio – sequencing of work, creative approach to combining work, presentation techniques
Reflective learners	reviewing own practical work using feedback and evaluation to deepen learning
Self-managers	working towards goals and showing commitment organising time and resources, prioritising actions.

Although PLTS are identified within this unit as an inherent part of the assessment criteria, there are further opportunities to develop a range of PLTS through various approaches to teaching and learning.

Skill	When learners are …
Independent enquirers	researching, raising questions, analysing and selecting information using research to support conclusions using discussion, independent study and small group work to share ideas
Creative thinkers	using different materials when mounting work using different formats when framing or mounting work
Reflective learners	evaluating their strengths and weaknesses monitoring own performance learning through feedback
Team workers	collaborating with other learners when working in pairs
Self-managers	managing time to achieve completed portfolio
Effective participators	taking ownership of own professional development setting realistic and appropriate goals when producing their portfolio.

Functional Skills – Level 2

Skill	When learners are …
ICT – Use ICT systems	
Manage information storage to enable efficient retrieval	keeping records on a USB, CD, server
Follow and understand the need for safety and security practices	working safely and adhering to legislation regarding working position, copyright, internet use
ICT – Find and select information	
Select and use a variety of sources of information independently for a complex task	finding relevant information and collating it presenting work in an online or digital format
ICT – Develop, present and communicate information	
Enter, develop and format information independently to suit its meaning and purpose including: • text and tables • images • numbers • records	preparing work for the portfolio
Bring together information to suit content and purpose	preparing the portfolio for a specific interview
Present information in ways that are fit for purpose and audience	presenting onscreen, documents for assessment in a folder or online
Select and use ICT to communicate and exchange information safely, responsibly and effectively including storage of messages and contact lists	sending a CV or preparing an online portfolio
English	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	presenting at an interview or mock interview
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	writing a personal statement, CV writing.

Unit 8: Working with 3D Design Briefs

Unit reference number: K/502/4862
Level 2: BTEC First
Credit value: 10
Guided learning hours: 60

Aim and purpose

The aim of this unit is to enable learners to explore, experiment with, and understand how to respond to 3D design briefs. The unit will involve learners in carrying out research from a range of primary and secondary sources appropriate to their brief.

Unit introduction

Designers explore ideas, materials and techniques in response to self-defined or given briefs. In order to develop their professional skills, they work with different materials and experiment widely to explore the potential of a chosen medium and its suitability for the task. They research widely from different sources to gain inspiration to help them develop ideas. Professionals continuously review the progress of their work to ensure it meets their creative intentions and the requirements of the brief.

An essential capability of 3D design is the ability to communicate 3D structures through 2D drafting media, increasingly using digital software. A valuable part of a learner's research will be to learn what a contemporary 3D designer does and the range of possible materials and techniques they employ to communicate their ideas most effectively. Learners will investigate historical and cultural visual arts to explore similar resources and constraints. Their wide-ranging research will inform their understanding of how to use 3D materials and techniques to express their creative intentions. Learners will review the progress and refine the process of their work through ongoing and final analysis in response to the given briefs.

Learners will explore and experiment with a variety of non-resistant and resistant materials to investigate the manipulation, treatment and creative possibilities of 3D design materials and techniques. This will involve 3D making techniques for carving, constructing and modelling, essential for using different materials and techniques successfully. Learners will need to learn about the care of and correct use of specialist 3D tools and equipment. They will also be made aware of the health and safety issues associated with the materials and techniques they study.

Learning outcomes

On completion of this unit a learner should:

1 Be able to use 3D design materials, techniques and processes

2 Be able to develop ideas to meet 3D design briefs

3 Understand the successful characteristics and quality of 3D design work.

Unit content

1 Be able to use 3D design materials, techniques and processes

3D design processes: planning; making eg construction, carving, moulding, drilling, fixing, joining, casting, CAD/CAM, weaving, assembling

3D materials: eg non-resistant materials (plaster, card, paper, lightweight wood, string, soft wire, plastic sheet, glues and adhesives), resistant materials (glass, metals, wood, wood-based products and rigid plastics)

Health and safety: Health and Safety Act 1974; elimination of risk to self and others; thinking and working safely within a studio environment and following the appropriate COSHH guidance on materials and techniques

2 Be able to develop ideas to meet 3D design briefs

3D design briefs: products eg ceramics, furniture, lighting, consumer and electrical goods, industrial products, interiors, environments, retail displays, exhibitions; analysis of briefs; response eg target market, needs, preferences; functions eg technical factors, size, scale, performance, ease of use, cost, method, scale of production

Selecting materials and techniques: qualities eg fitness for purpose, aesthetics, alternative options; exploring properties eg characteristics, effects, uses, limitations, creative potential

Meeting the brief: eg artefact purpose, factors, opportunities, constraints (time, access, working materials, specialist equipment, other resources, budget, content), presentation; others' projects eg similar briefs, community, commercial, professional, success (projects, audience, influence)

3 Understand the successful characteristics and quality of 3D design work

Characteristics: analysis eg alternative options; exploring properties eg effects, uses, limitations, creative potential; suitability eg image purpose, factors, opportunities, constraints (time, access, props, specialist equipment, other resources, budget, content), presentation; others' projects eg similar briefs, commercial, professional, success (projects, campaigns, influence)

Quality: eg comparison, original intentions, aesthetic qualities, technical qualities, sustainability, strengths, weaknesses, areas for improvement; own work; others' work

3D design work: own work; others' work eg peers, professionals

Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

Assessment and grading criteria					
To achieve a pass grade the evidence must show that the learner is able to:		**To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:**		**To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:**	
P1	use 3D design materials, techniques and processes safely [IE, CT, SM, RL]	**M1**	explore 3D design materials, techniques and processes effectively	**D1**	integrate diverse 3D design materials, techniques and processes creatively and independently
P2	select appropriate materials, techniques and processes to meet 3D design briefs [CT, TW, SM]	**M2**	develop effective, coherent ideas and outcomes to meet 3D design briefs	**D2**	develop imaginative ideas and outcomes to meet 3D design briefs
P3	develop ideas and outcomes to meet 3D design briefs [IE, CT]	**M3**	compare and contrast experimental, development and final creative works.	**D3**	evaluate experimental, development and final creative works.
P4	discuss successful 3D design work. [IE, RL]				

PLTS: This summary references where applicable, in the square brackets, the elements of the personal, learning and thinking skills applicable in the pass criteria. It identifies opportunities for learners to demonstrate effective application of the referenced elements of the skills.

Key	IE – independent enquirers	RL – reflective learners	SM – self-managers
	CT – creative thinkers	TW – team workers	EP – effective participators

Essential guidance for tutors

Delivery

Tutors delivering this unit can address all learning outcomes through the two suggested assignments shown in the outline learning plan. Assignment number 1 is a research-based task that will generate some of the evidence for learning outcome 3. Tutors should deliver a presentation that shows examples of 3D design work across a range of disciplines. Learners should record their observations in their work journals or sketchbooks. Learners should then use information gained from the tutor presentation to further their research by sourcing and discussing additional examples of 3D design. Information gathered should be used as a platform from which learners launch their own practical explorations in their personal project, assignment number 2.

Learners will need to work through the activities and stages shown in assignment number 2, and record all the stages of their research and ongoing design development work. Tutors should direct learners to produce a plan for their work, including production methods, materials and timescales. Information on health and safety will also need to be included. On completion of this activity, tutors should sign off the plan and learners can then move to the practical production stage. These activities will produce evidence for learning outcome 1 and learning outcome 2. These outcomes are developed through learners working to produce all relevant test pieces, maquettes or working models, prototypes and the final piece or pieces. Tutors will need to ensure that learners have access to technical support and that all aspects of health and safety are carefully observed.

Ongoing evaluation will also need to feature in this stage of the assignment, as this will provide a sound basis for a more in-depth evaluation than leaving this aspect of the unit until the completion of practical work. These activities will provide further evidence for learning outcome 3. Learners will need to evaluate and review their practical output against the constraints of the design brief they have worked to. They may consider how effectively their outcomes meet the purpose of the brief. Learners should review their use of materials and techniques and compare them to the production processes they researched. In this way the unit will return learners to the skills and understanding required when analysing and interpreting a design brief.

Outline learning plan

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments.

The outline learning plan demonstrates one way in planning the delivery and assessment of this unit.

Topic and suggested assignments/activities and/assessment
Unit read through and outline scope of the unit.
Assignment 1: Research into 3D Design Briefs Group read through. Tutor presentation of examples of 3D design work using a range of materials in advertising, graphic design, social, fine art, fashion, reportage, industrial, scientific etc. Learners research independently into aspects of 3D design briefs. Tutor input, review. Learners present examples and compile research. Learners discuss conclusions.
Assignment 2: Personal Project (themes can be set by tutor but can be broad enough to encourage learners to take ownership) Stage 1 – identify subject – learners can relate subject to previous work in other units and/or ideas generated from research tasks in assignment 1. Stage 2 – produce a plan for the production of the piece – work in liaison with tutor/s and technician/s to ensure health and safety and risk assessments are carried out. Stage 3 – sign off plan, ensure all equipment is ready as required. Stage 4 – produce the piece/s, working independently. Tutor input, review. Stage 5 – ongoing problem solving and review/adaptation. Stage 5 – prepare presentation of work. Stage 6 – present piece; evaluate reactions and feedback.

Assessment

For P1, learners will use 3D design techniques to experiment and produce test, samples, maquettes and final pieces. The level of skill and handling, and the empathy with the inherent qualities in the materials, will be limited. Learners will comply with all the necessary health and safety and COSHH legislation when producing their work, and maintain good studio practice throughout the practical assignment.

For P2, learners will select a limited range of materials, techniques and processes. These will meet the requirements of the brief, but will not extend the possibilities offered by combining or experimenting with materials. The range of materials chosen will be obvious; risks will not be taken at the planning stage, and ideas will not be stretched.

For P3, learners will be able to produce a basic set of design ideas in response to the brief. The scope of their research will not necessarily have extended that given in the tutor presentation. These will tend to be obvious and lack exploration.

For P4, learners will be able to discuss their work in terms of the design brief. Conclusions reached will tend to be over simplistic. Links between the results and processes used, choices of materials and areas for development may be noted, but conclusions reached will be obvious. Learners will consider how professional 3D designers have worked with similar briefs. Evaluative skills will not be applied in any great depth. There will be some understanding of how designers react to design briefs, but this will not be perceptive.

For M1, learners will be able to explore more confidently a wider range of materials and processes than those at pass grade. The choices made will reflect a deeper involvement and understanding with the design process than in work assessed at P1. Learners will use their chosen 3D materials and processes consistently through their design development and production activities. Work produced will demonstrate an effective control of materials.

For M2, learners will develop ideas for the design brief that address the intended purpose and function of the final outcome effectively. Ideas will be recorded and expressed in a clear and effective manner.

For M3, learners will be able to discuss their work as set against the design brief in a considered manner. Ideas and perceptions will be clearly explained. Learners will be able to consider the work of other 3D designers with some sense of purpose. They will outline the designers' interpretations, choice of materials and application, and make comparisons with their own work.

For D1, learners will be able to select their materials and identify processes to be used in their practical work. Their rationale for choosing these specific materials and how they use them will be clearly articulated. Learners will use the materials and processes they have selected in an innovative way. This may involve using making techniques in adventurous ways, or combine different techniques and processes in original ways.

For D2, learners will be able to develop diverse and exciting ideas that fully meet the design requirements of the brief. This may involve exploration of different themes and source materials.

For D3, learners will be able to explain their output in an informed manner. They will be able to demonstrate how their ideas and practical work meet the demands of the brief with perception. They will be able to link evaluations of their own work to other 3D designers with a sense of clarity and purpose. They will identify approaches connected to the designers' interpretation, choice of materials and application that make their work successful.

Programme of suggested assignments

The table below shows a programme of suggested assignments that cover the pass, merit and distinction criteria in the assessment and grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Pearson assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P2, M2, D2 P4, M3, D3	Research into 3D Design Briefs	A 3D designer is exploring iconic designs in their field, and is aiming to identify the factors employed by the designers to make the resulting pieces unique.	Portfolio of evidence consisting of: • work journals, containing notes from tutor presentation and own research • presentation by learners.
P1, M1, D1 P2, M2, D2 P3, M3, D3 P4	Personal Project	A designer is developing a range of functional items for a retailer. The initial designs are ready for presentation, and the designer is planning to get approval to move to the production stage of the commission.	Learners' preliminary work and initial ideas. Learners' presentations of ideas for project. Learners' use of 3D materials, processes and techniques to explore the design development process. Tutor observation of studio practice. Learners' practical work and final outcomes. Learners' review of working practices and outcomes. Presentation at close of assignment to include evaluation and review of the design process.

Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

This unit forms part of the BTEC Art and Design sector suite. This unit has particular links with the following unit titles in the Art and Design suite:

Level 1	Level 2	Level 3
Explore 3D Design Crafts	2D Visual Communication	Design Methods in Art and Design
	3D Visual Communication	Design Principles in Art and Design
	Working with Textile Briefs	

This unit also provides development opportunities for some of the underpinning skills, knowledge and understanding of the following National Occupational Standards:

CCSKills (Draft Design NOS, May 2009)

- DES1 Apply research on the history and theory of design to your own design activities
- DES2 Apply design industry knowledge to inform your own design work practice and work
- DES3 Use Critical Thinking Techniques in your design work
- DES4 Communicate the importance of the design brief
- DES5 Follow a design process
- DES6 Work effectively with others in a creative environment
- DES7 Contribute to the production of prototypes, models, mock-ups, samples or test pieces
- DES8 Explore the use of colour in a creative environment
- DES9 Research, test and apply techniques for the design of products
- DES10 Create visual designs
- DES11 Provide written information in relation to your design work
- DES12 Make a presentation
- DES15 Research and evaluate the nature of design in a specific industry context
- DES18 Interpret the design brief and follow the design process
- DES23 Create 2D Designs using a Computer Aided Design System
- DES24 Create 3D Models using a Computer Aided Design System
- DES32 Apply concepts and theories of creativity and innovation to your own design work.

Essential resources

Delivery of this unit will focus on learners exploring research through an initial assignment. This will be followed up with ideas development and practical production against a set or self-generated 3D design brief.

Learners will need access to specialist 3D design studios, depending on the range available in the centre. They will also require access to specific technical support within the 3D area.

Learners should incorporate safe working practices into their learning as part of the practical work in the unit.

Employer engagement and vocational contexts

This unit can be delivered through a live project. Centres should aim to develop links with appropriate local organisations, willing to support learners in producing work for a specific aim. Local galleries/museums may be able to work in partnership to give learners 3D related vocational contexts, such as model making for a coming exhibition. There may be opportunities to secure a project involving the production of 3D graphics based pieces eg models for proposed signage.

Vocational learning support resources:

- Learning and Skills Network – www.vocationallearning.org.uk

Business and finance advice:

- local and regional Business Link – www.businesslink.gov.uk

Assignments should be vocationally relevant; centres should consider the delivery of 'live projects', for example to support the vocational content of the unit and programme.

Creative and Cultural Skills (www.ccskills.org.uk), the sector skills council for design have launched the web portal Creative Choices (www.creative-choices.co.uk). This portal has a range of information about careers in the design sector, including job descriptions.

Indicative reading for learners

Textbooks

De Sausmarez M – *Basic Design: The Dynamics of Visual Form* (Herbert, 2007) ISBN 978-0713683660

Dormer P – *Design Since 1945* (Thames & Hudson, 1993) ISBN 978-0500202616

Feill C and P – *Designing the 21st Century* (Taschen, 2005) ISBN 978-3822848029

Feill C and P – *Industrial Design A-Z* (Taschen, 2006) ISBN 978-3822850572

Forty A – *Objects of Desire* (Thames & Hudson, 1986) ISBN 978-0500274125

Herbert T and Huggins K – *The Decorative Tile in Architect and Interiors* (Phaidon, 2000) ISBN 978-0714839790

Lidwell W et al – *Universal Principles of Design: 115 Ways to Enhance Usability, Influence Perception, Increase Appeal, Make Better Design Decisions and Teach Through Design* (Rockport Publishers Inc, 2010) ISBN 978-1592535893

Massey A – *Interior Design of the 20th Century* (Thames & Hudson, 2001) ISBN 978-0500203466

Mills J – *Encyclopedia of Sculptural Techniques* (B T Batsford, 2005) ISBN 978-0713489309

Norman D A – *Emotional Design* (Basic Books, 2005) ISBN 978-0465051366

Norman D A – *The Design of Everyday Things* (Basic Books, 2002) ISBN 978-0465067107

Powers A – *Nature in Design* (Conran Octopus, 2002) ISBN 978-1840912579

Sparke P – *Design in Context* (Bloomsbury, 1991) ISBN 978-0747510949

Terraroli V – *Skira Dictionary of Modern Decorative Arts* (University of Turin, 2001) ISBN 978-8884910257

Website

www.designmuseum.org The Design Museum

Delivery of personal, learning and thinking skills

The table below identifies the opportunities for personal, learning and thinking skills (PLTS) that have been included within the pass assessment criteria of this unit.

Skill	When learners are …
Independent enquirers	carrying out research into the field of 3D design adapting ideas in response to results of 3D design media exploration considering 3D work against the design brief
Creative thinkers	exploring ideas for production of final piece using different 3D materials, techniques and processes
Reflective learners	considering alternative ideas and evaluating their strengths and weaknesses reviewing own work against the design brief reviewing others' work in 3D design
Team workers	working in 3D design studio and observing safe studio practice
Self-managers	managing the ideas generation process managing the production process
Effective participators	reviewing and explaining how others' work meets design requirements.

Although PLTS are identified within this unit as an inherent part of the assessment criteria, there are further opportunities to develop a range of PLTS through various approaches to teaching and learning.

Skill	When learners are …
Independent enquirers	sourcing information on different 3D materials and processes
Creative thinkers	looking at 3D items around the studio and home environments and considering fitness for purpose
Reflective learners	identifying different ways to explore materials and techniques.

Functional Skills – Level 2

Skill	When learners are …
ICT – Use ICT systems	
Select, interact with and use ICT systems independently for a complex task to meet a variety of needs	using 3D software to create designs
ICT – Find and select information	
Select and use a variety of sources of information independently for a complex task	finding examples of 3D designers' work to compare with their own
Access, search for, select and use ICT-based information and evaluate its fitness for purpose	sourcing information from websites and electronic publications about 3D designers, design briefs and iconic examples of design
ICT – Develop, present and communicate information	
Enter, develop and format information independently to suit its meaning and purpose including: • text and tables • images • numbers • records	using CAD/CAM or other digital means to produce 3D work
Bring together information to suit content and purpose	
Present information in ways that are fit for purpose and audience	presenting findings on own and others' work
Evaluate the selection and use of ICT tools and facilities used to present information	trying out different 3D CAD programmes
Mathematics	
Select and apply a range of skills to find solutions	considering measurements, scaling and proportion in their practical work
English	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	taking part in critiques or group presentations
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	sourcing and reading information examples of 3D design and practitioners reading and absorbing information about health and safety relating to materials, processes and equipment to be used.
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	recording relevant technical information about equipment compiling information from reviews or presentations.

Unit 9: Working with 3D Design Crafts Briefs

Unit reference number: F/502/4866
Level 2: BTEC First
Credit value: 10
Guided learning hours: 60

Aim and purpose

This unit explores working in 3D design crafts, a broad area that can cover furniture, jewellery and accessories, mixed media, automata, metalwork, woodwork, glass, plastics and ceramics. Learners will need to be able to research, explore and develop ideas to make 3D design craft, using either self-negotiated or given briefs.

Unit introduction

Design craftworkers employ a process of designing and making objects which can be decorative or functional. Designing and making skills are combined to produce considered and developed items. In many cases successful creative practitioners will be skilled in more than one material and may combine materials in their work. Learners should explore a range of materials and techniques to provide sufficient evidence for assessment.

Learners will carry out research from a range of primary and secondary sources appropriate to their brief. A valuable part of their research will be to learn what a contemporary professional craftworker does and the range of possible materials and techniques they employ to communicate their ideas effectively. Learners will explore historical and cultural 3D design crafts to underpin their research and development of ideas. Wide-ranging research will inspire learners to be innovative and creative in their approach to designing and making. Visits to galleries, museums and workshops, and from visiting lecturers will help broaden learners' understanding of the breadth of design crafts. Investigation into the contemporary craft scene, both in the UK and internationally will give learners an insight into the current vocational context of design crafts and its importance to the economy.

Learners will be encouraged to explore the crossover of form and function and to analyse their design ideas for fitness for purpose. Learners should be encouraged to combine materials in order to develop a range of skills. Research skills will be contextualised through the design process and learners will have the opportunity to develop evaluative skills through analysis of their design throughout the process.

This unit can be linked with other units in order to develop a broad range of transferable and relevant skills.

Learning outcomes

On completion of this unit a learner should:

1 Be able to research and record primary and secondary sources in response to 3D design crafts briefs

2 Be able to explore and develop ideas to meet 3D design crafts briefs

3 Be able to use 3D design crafts materials, techniques and processes

4 Understand the successful characteristics and quality of 3D design crafts work.

Unit content

1 Be able to research and record primary and secondary sources in response to 3D design crafts briefs

Research: primary research eg drawings, sketches, taking photographs; secondary research eg photocopies, collecting ready-made resources

Recording: materials eg graphite, charcoal, pen, ink, wash, oil pastels, chalks, hand made tools, cameras; techniques; processes eg painting, drawing, montage, collage, photography, video, digital scanning, manipulation, printmaking, modelling, interview notes, recorded interviews with makers, annotation in sketchbooks; formal elements eg line, tone, form, colour, texture, pattern

Sources: primary eg first-hand observation drawings, own photographs, studios, museums, galleries, exhibitions, poetry, music; secondary eg images, clippings, websites, photographs, journals, photocopies, postcards, leaflets, books, magazines, blogs, CD ROMs

2 Be able to explore and develop ideas to meet 3D design crafts briefs

Explore and develop ideas: eg use research material, inform ideas, others' work, idea generation, experimenting, testing, planning, reviewing, refining, design process; formal elements; visual language; creating; communicating; design ideas; recording; presenting findings; appropriate formats eg drawings, notes, samples, sketchbooks, design sheets; annotate; design ideas; fitness for purpose; viability of designs; constraints; opportunities

Design crafts briefs: artefact eg jewellery, furniture, accessory, automata, ceramics, metalwork, woodwork, glass, plastics, one-off, set; technical factors eg type, properties, characteristics, materials, costs, scale of production, time, performance, fit; specialist markets eg retailers, craft fairs, studio potters, tourism, locations, heritage, collectors, demographics, nostalgia, anniversaries, commemoration, events, concerts, mementos

3 Be able to use 3D design crafts materials, techniques and processes

3D materials: non-resistant materials eg plaster, clay, card, paper, balsa wood, string, wire, mod roc, papier mache, felt, fabrics; resistant materials eg metal, wood, MDF, ply, chipboard, perspex, glass, found objects

3D techniques and processes: making eg cutting, carving, construction, joining, bonding, fusing, drilling, stitching, weaving, forming, moulding, finishing

Health and safety: Health and Safety Act 1974; elimination of risk to self and others; thinking and working safely within a studio environment; following the appropriate COSHH guidance on materials and techniques

4 Understand the successful characteristics and quality of 3D design crafts work

Discuss: eg annotated worksheets, sketchbooks; recordings of discussions; explanations; descriptions; comments; evaluations; tutorials; spoken word, video, face to face, individual, group crit; eg technical and art terms eg art, craft, design processes, qualities

Characteristics: analysis eg alternative options; exploring properties eg effects, uses, limitations, creative potential; suitability eg image purpose, factors, opportunities, constraints (time, access, props, specialist equipment, other resources, budget, content); presentation; others' projects eg similar briefs, commercial, professional, success (projects, campaigns, influence)

Quality: eg comparison, original intentions, aesthetic qualities, technical qualities, sustainability, strengths, weaknesses, areas for improvement; own work; others' work; tutors; client; documentation eg notes, minutes of meetings, notes from feedback, production diaries

Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

Assessment and grading criteria					
To achieve a pass grade the evidence must show that the learner is able to:		**To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:**		**To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:**	
P1	research and record primary and secondary sources in response to 3D design crafts briefs [IE, CT]	**M1**	conduct effective research and record appropriate visual and other information from primary and secondary sources in response to 3D design crafts briefs	**D1**	independently research and record diverse visual and other information from primary and secondary sources in response to 3D design crafts briefs
P2	develop ideas and outcomes to meet 3D design crafts briefs [CT, SM]	**M2**	develop coherent ideas and outcomes to meet 3D design crafts briefs	**D2**	develop imaginative ideas and outcomes to meet 3D design crafts briefs
P3	use 3D design crafts materials, techniques and processes safely [CT]	**M3**	explore materials, equipment and techniques effectively	**D3**	explore diverse materials, equipment and techniques imaginatively and independently
P4	discuss successful 3D design crafts work. [RL]	**M4**	compare and contrast experimental, development and final creative works.	**D4**	evaluate experimental, development and final creative works.

PLTS: This summary references where applicable, in the square brackets, the elements of the personal, learning and thinking skills applicable in the pass criteria. It identifies opportunities for learners to demonstrate effective application of the referenced elements of the skills.

Key	IE – independent enquirers	RL – reflective learners	SM – self-managers
	CT – creative thinkers	TW – team workers	EP – effective participators

Essential guidance for tutors

Delivery

This unit provides the learners with the opportunity to work in any area of 3D design crafts such as ceramics, jewellery, sculpture, textiles, glass, etc (the learner may work in one or several areas of 3D design crafts, for example ceramics, or ceramics and glass). The current climate for contemporary craft is lively and exciting and learners should be encouraged to explore current practice and look at the work of contemporary practitioners to support their research.

Learners should be encouraged to investigate the creative use of media and materials within a craft context. The range of media, materials, techniques and technology that the learners explore should enable them to investigate an area of personal preference. The breadth of experience will depend on the centre's resources.

Learners should be taught:

- how to research and collect information
- the specialist techniques and processes required for the different craft areas
- how to use and look after specialist tools and equipment correctly – health and safety
- how to develop ideas into a resolved final outcome.

This unit has been designed to provide an opportunity for learners to undertake focused projects in the specialist area of 3D design crafts. The briefs should have a clear starting point, a period of experimentation and development, resolution and evaluation. Typically this would be through briefs that reflect current commercial and professional practice. Depending on the choice of specialist materials, briefs could combine work in different specialist areas such as furniture, jewellery and accessories.

Learners will need to be advised of, and adhere to, all aspects of current legislation associated with health and safety practices in the studio or workplace. Learners should follow appropriate COSHH guidance.

Learners need to be able to choose suitable material, techniques and processes to realise their ideas and respond to briefs. They should be encouraged to explore non-traditional media and to combine different materials and techniques to develop their ideas. Their 3D experimental work should be evidenced through trials, samples, test pieces and maquettes. Work produced can be functional or decorative.

Learners should continuously evaluate their progress through reviewing the materials, techniques and processes they use; discussing and commenting on the properties and characteristics of the media employed. They should also learn to critically evaluate the quality of their achievement, documenting their opinions on what worked well or not and why, in response to their brief. Strong evaluation skills and an understanding into how they have learnt will help these learners to progress from a Level 2 learner into a Level 3 learner.

Learners should be encouraged to keep all evidence of their studies in working sketchbooks, where they might record the development of their ideas, the effects and results of their experimentation with materials and techniques and how their skills might be improved. Regular feedback should be given to learners through day-to-day discussion and formal and informal interim assessment.

Learning outcomes 1, 2 and 3 can be integrated through practical studio experiences.

Learning outcome 4 should be integrated with learning outcomes 1, 2 and 3, through an ongoing review, evaluation and documentation of learners' exploratory studio work rather than just at the end. For learning outcome 1, learners will need to be encouraged to explore and investigate primary and secondary sources. They will need to be guided on their selection of sources in relation to the brief and to develop their recording skills, manipulating the formal elements to communicate observed qualities of forms. Learners will need to develop their skill and control in handling media for the purpose of recording from their selected sources. Although selection of materials, techniques and technology for the process of recording will depend on the individual centre's available resources, it is expected that learners have access to as broad a range as possible.

For learning outcome 2, learners need to be taught how to explore and develop ideas. They should learn to use the relevant research material to develop and create designs. Initially this outcome is likely to be delivered through discussion about potential ideas and demonstration, perhaps launching the brief through an inspiring presentation of slides/images. Tutors should encourage learners' participation in analysing the brief through asking probing questions and developing learners' creative ability in generating exciting, innovative ideas. Delivery techniques should be varied and stimulating, encouraging learners to investigate the creative use of techniques and technology within a design crafts context. Group activities would be beneficial at this level, with learners discussing and developing ideas around a set brief, looking at possible options for individual investigation. An inspiring visit or workshop from a recent arts graduate or established artist can also add validity to the learning experience. Learners may have quite different areas of personal preference they would like to investigate and they will need opportunities to experiment with approaches and methods individually, then meet to share the results. Learners should plan and follow the stages of the design process and understand how formal elements and design principles can be used to create design ideas. They should produce a range of designs that show experimentation with materials and the formal elements and design principles.

Their findings should be recorded and presented in an appropriate format (for example drawings, notes, samples, design sheets etc); these can then be developed into 3D designs. Learners should be taught how to keep a balance between aesthetics and function, ensuring both elements are met. As well as their own exploratory work, off-site visits to workshops or contemporary exhibitions would motivate learners and provide a vocational context.

Learning outcome 3 should be delivered as an integrated part of both learning outcomes 1 and 2. For learning outcome 3, learners should be introduced to specialist products, techniques and processes and the development of their specialist skills, knowledge and understanding (see *Content* and *Essential resources*), relevant to their sources and ideas for their 3D design crafts brief. Investigating 3D craft practitioners will enable learners to gain insight into how professionals work in 3D design crafts, what media they use and the techniques they employ, as well as helping them decide on the vocational direction in which they wish to go. The best way of doing this would be by visiting practitioners' studios.

For learning outcome 4, learners will need to be taught how to record, analyse, modify and refine ideas for their work and working processes. Learning outcome 4 is an opportunity for learners to reflect on their work while drawing parallels with the work of others. When reviewing outcomes learners need to take into account what the successes were, what the failures were, and why. They will need to consider and document the development of their ideas, the use of media and quality of final outcomes. If the learner has produced a working prototype then, as part of the evaluation, it is possible to carry out practical tests, this should allow a clear and objective assessment of the outcome. When making modifications learners need to refine and clarify their intentions and working practices. These modifications need to be documented and the final outcome recorded using drawings, photographs, maquettes or video depending on the type or scale of work. Learners will need to be taught how to present their work to suit the finished piece and the environment that it is to be shown in. Presentation skills should be developed and can include the use of IT, for example, onscreen presentation, scanning sketchbook pages into *Photoshop* to produce design sheets, or using colour photocopies to enhance the quality of presentation sheets. Learners need to understand the importance of presentation techniques; they should consider the environment for the outcome, the construction and proportions of plinths or fixings and health and safety as well as fitness for purpose of the final outcome.

Outline learning plan

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments.

The outline learning plan demonstrates one way in planning the delivery and assessment of this unit.

Topic and suggested assignments/activities and/assessment
Assignment 1: A Memory Box. To design and make a memory box based on the work of Joseph Cornell. Using a range of found objects and employing making skills in a range of media and materials. (Wood, balsa, paper, card, fabric, found objects.) Information gathering – visits, sketching, photographing, internet research, gathering images, artists research on Joseph Cornell. Independent learner design development – gather imagery for memory box, expand ideas, material sampling, planning, thumbnails, relates designs to research. Refine ideas, materials exploration, update design sheets and sketchbooks. Produce outcomes using personal imagery and 3D pieces to convey meaning. Present ideas and evaluate outcomes.
Assignment 2: Accessory Design: Making accessories using traditional and non-traditional materials. Can be for a client or situation, to convey meaning or for a client who would not normally wear an accessory. Work produced could be for a sale or exhibition. (Felt, fabrics, paper, wire, card, plastics.) Research contemporary designer makers who use a range of materials in their work, gallery visit, studio visit, visiting lecturer. Independently develop ideas, skills workshops eg feltmaking, paper manipulation, sewing techniques with traditional and non-traditional materials, produce sketches, design sheets, sketchbook work, target audience, example costings. Refine ideas, choose and make final piece(s) take photographs of work. Evaluate ideas and outcomes, is the piece fit for purpose and well made.

Topic and suggested assignments/activities and/assessment
Assignment 3: Automata: To design and make a piece of work that has at least one moving part and is made from either a range of materials or found objects, ie recycled metals and fabric. The finished item could be sculptural, functional, a toy or an item of jewellery. Look at contemporary artists who use automata in their work. Visiting lecturer, exhibition visit, studio visit, talk. Material workshops and exploration, found objects, fabric, metals, recycled items, plastics, recycled materials workshop. Independent design development, refine ideas, include findings from research and sampling to show how ideas have developed. Refine and produce final piece. Present ideas and evaluate strengths and weaknesses.

Assessment

For P1, learners must show evidence that they have researched and recorded from a basic range of primary and secondary resources in response to the brief. A basic range might comprise observational drawing or photographs from an off-site visit and secondary might be internet and magazine research on contemporary makers from a short list given by the tutor.

Learners will demonstrate limited skills in manipulating the formal elements and a basic visual language understanding in recording from their sources. This would be using line and tone, colour and shape to record information and communicate ideas. The work may be tentative rather than confident in approach and may have little detail and independent exploration.

For P2, learners will explore and develop a limited range of ideas to meet 3D design crafts briefs. This would be evidence that the learner had generated several ideas and worked them through in a sketchbook or on a design sheet annotating what materials might be used and the scale of the work. Evidence for P2 might take the form of sketchbook thumbnail studies, ideas worksheets or 3D tests and maquettes.

Evidence for P3 could be integrated successfully with P1 and P2. For P3, learners' evidence should include a limited range of studies and samples that have been chosen to demonstrate their appropriate selection and use of 3D design craft materials, and techniques in response to the requirements of the brief. They are expected to use a limited range of skills to meet this criterion. Assessment evidence could be taken from learners' sketchbooks, worksheets, trials, test pieces, maquettes and sample products, chosen to reflect the development of their ideas and skills in handling 3D design craft materials. The finish should have been considered but making skills may not be highly developed at this level.

Evidence for P4 could be integrated with the evidence for P1, P2 and P3. The evidence for P4 might take the form of learners' annotated sketches and studies for initial recording and ideas together with limited notes on the quality of their ongoing achievement in their use of materials and techniques. Learners will need to reflect on others' work that follows similar themes, subject matter or uses similar processes or materials. Visits to galleries, exhibitions and especially visits from practitioners will give opportunities examine others' working processes in detail.

Annotation may be descriptive rather then detailed and evaluative. This evidence might also be achieved through informal presentation and discussion or via witness statements and/or observation records. Photographing work as it develops is useful to show the making and development of the project; to develop evaluative skills and confidence a writing frame can be used, giving the learner headings to consider on a regular basis.

For M1, learners must show evidence that they have effectively researched and recorded from a range of primary and secondary resources in response to the brief. They will demonstrate more assured skills in manipulating the formal elements and an effective visual language understanding in recording from their sources.

For M2, learners will explore and develop a range of ideas effectively to meet 3D design crafts briefs with an awareness of safe working practices.

Evidence for M2 might take the form of sketchbook thumbnail studies, ideas worksheets or 3D tests and maquettes. Learners would have generated several workable ideas in a range of media and investigated combining materials.

Evidence for M3 could be integrated successfully with M1 and M2. For M3, learners' evidence should include a range of studies and samples that have been chosen to demonstrate their appropriate selection and competent use of alternative 3D design craft materials, and techniques in response to the requirements of the brief. They are expected to use an effective range of skills to achieve this criterion, pieces should be considered and finished. Assessment evidence could be taken from learners' sketchbooks, worksheets, trials, test pieces, maquettes and sample products, chosen to reflect the development of their ideas and skills in handling 3D design craft materials. Although set tasks may be similar as those for pass level, for learners at this level, tutors would additionally expect learners to carry out creative experimentation appropriate to communicating their ideas.

Evidence for M4 could be integrated with the evidence for M1, M2 and M3. The evidence for M4 could take the form of learners' effectively annotated sketches and studies for initial recording and ideas, together with competent notes on the quality of their ongoing achievement in the use of materials and techniques. Learners will need to draw comparisons with the work of others. This evidence could also be achieved through informal presentation and discussion or via witness statements and/or observation records.

For D1, learners must show evidence that they have independently researched and recorded from a diverse range of primary and secondary resources in response to the brief. They will demonstrate confident skills in manipulating the formal elements and extensive visual language understanding in recording from their sources.

For D2, learners will explore and develop a wide range of ideas imaginatively and creatively to meet 3D design crafts briefs with an awareness of safe working practices. Evidence for D2 might take the form of sketchbook thumbnail studies, ideas worksheets and 3D tests and maquettes showing the range and depth of development for this level.

Evidence for D3 could be successfully integrated with D1 and D2. For D3, learners' evidence should include a diverse range of creative studies and samples that have been chosen to demonstrate their appropriate selection and confident use of alternative 3D design craft materials, and techniques imaginatively and safely, in response to the requirements of the brief. They are expected to use a wide range of skills independently to achieve this criterion. Assessment evidence might be taken from learners' sketchbooks, worksheets, trials, test pieces, 3D design craft materials. Tutors would additionally expect learners to carry out a wide range of creative experimentation appropriate to communicating their ideas. It would be expected that learners' would produce a wide range of developmental studies and product samples demonstrating their skilful and imaginative manipulation of materials, techniques and processes. For D2 and D3, learners would be expected to show creativity and independence in their working, using a broad range of techniques and processes as available.

Evidence for D4 might be integrated with the evidence for D1, D2 and D3. This evidence for D4 could take the form of learners' confidently annotated sketches and studies for initial recording and ideas, together with in-depth written analysis on the quality of their ongoing achievement in the use of materials and techniques, linked to insights on others' similar work. This evidence could also be achieved through informal presentation and discussion or via witness statements and/or observation records.

Programme of suggested assignments

The table below shows a programme of suggested assignments that cover the pass, merit and distinction criteria in the assessment and grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Pearson assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1, P2, P3, P4, P5 M1, M2, M3, M4 D1, D2, D3, D4	A Memory Box	Craftworker creates a new product.	Formative including discussion, critiques, feedback for learning, one-to-one reviews, peer assessment. Summative including panel review, presentation, exhibition, show. Evidence: sketchbooks research, design sheets, samples, finished piece, evaluation.
P1, P2, P3, P4, P5 M1, M2, M3, M4 D1, D2, D3, D4	Accessory Design	Designer creates accessory, linked to artefacts in an exhibition.	Formative including discussion, critiques, feedback for learning, one-to-one reviews, peer assessment. Summative including panel review, presentation, exhibition, show. Evidence: sketchbooks research, design sheets, samples, finished piece, evaluation.
P1, P2, P3, P4, P5 M1, M2, M3, M4 D1, D2, D3, D4	Automata	Designer makes a craft work with moving parts for an animated story.	Formative including discussion, critiques, feedback for learning, one-to-one reviews, peer assessment. Summative including panel review, presentation, exhibition, show. Evidence: sketchbooks research, design sheets, samples, finished piece, evaluation.

Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

This unit forms part of the BTEC Art and Design sector suite. This unit has particular links with the following unit titles in the Art and Design suite:

Level 1	Level 2	Level 3
Explore 3D Design Crafts	Contextual References in Art and Design	Materials, Techniques and Processes in Art and Design
	2D Visual Communication	Communication through Art and Design
	3D Visual Communication	

This unit also provides development opportunities for some of the underpinning skills, knowledge and understanding of the following National Occupational Standards:

CCSKills (Draft Design NOS, May 2009)

- DES1 Apply research on the history and theory of design to your own design activities
- DES2 Apply design industry knowledge to inform your own design work practice and work
- DES3 Use Critical Thinking Techniques in your design work
- DES4 Communicate the importance of the design brief
- DES5 Follow a design process
- DES6 Work effectively with others in a creative environment
- DES7 Contribute to the production of prototypes, models, mock-ups, samples or test pieces
- DES8 Explore the use of colour in a creative environment
- DES9 Research, test and apply techniques for the design of products
- DES10 Create visual designs
- DES11 Provide written information in relation to your design work
- DES12 Make a presentation
- DES15 Research and evaluate the nature of design in a specific industry context
- DES18 Interpret the design brief and follow the design process
- DES32 Apply concepts and theories of creativity and innovation to your own design work.

Essential resources

This unit can be delivered in a classroom as long as there is adequate access to a range of specialist techniques and materials. Learners will need access to appropriate specialist learning areas. Learners will also need storage for their outcomes as they develop during this unit. Assessment should be ongoing through the unit so that learners are given feedback to help them develop their outcomes and improve their skills. Assessment evidence on completion of this unit should include sketchbooks, design sheets, material samples, annotation and evaluation and final pieces which are clearly linked to research and design development.

Adequate resources, work and storage space should be provided for the learners to explore a range of the materials and techniques identified in this unit. For materials the learners need to work with a variety of fabrics, yarns, threads, clay, wood, light metals etc. The techniques and processes will be those associated with the choice of materials.

For clay: techniques such as hand building, modelling, throwing, press-moulding, slip casting and decorating. Whole processes such as preparing clay, hand-building, throwing and glazing.

For textiles: techniques such as embroidering, felting, weaving, knitting, printing, dying. Whole processes such as preparation of fabrics, pressing, creating a loom, applying decoration, creating items from textiles, finishing.

For wood: techniques such as cutting, preparing, joining, construction, piecing, turning, shaping and finishing, laminating. Whole processes such as selecting the type of wood most suitable for the intended purpose, making a cutting list, planning, cutting, shaping, joining, sanding, sanding and finishing.

For light metals: techniques such as cutting, preparing, joining, constructing, piecing, filing, turning, shaping, braising, soldiering, beating, polishing, applying surface decoration and textures.

Whole processes such as measuring and marking out, cutting out the basic shape, forming, annealing, joining to other forms, applying surface decoration, such as enamelling or soldering, cleaning, polishing and finishing.

For plastics: techniques such as cutting, line bending, forming and moulding, joining, laminating, constructing, piecing, shaping and finishing. Whole processes such as planning, measuring and marking out, cutting, drilling, creating and finishing. The tools and equipment that will be required will be those associated with the materials, techniques and processes applied.

For clay: clay tools, wheels, slip trailers, brushes, kilns etc.

For textiles: scissors, needles, tape measures, looms, sewing machines etc.

For wood: saws, planes, drills, chisels, carving tools, hammers, screwdrivers, sanding machines etc.

For light metals and plastics: saws, snips, files, drills, soldering irons, hammers, vices, pliers, power drills, vacuum former etc.

Learners will need access to information on historical and contemporary professional practice in a design craft context. They will also need library and internet access, visits to galleries, museums, exhibitions and working studios.

Employer engagement and vocational contexts

Opportunities could be developed through this unit, to work with a client to produce work for an exhibition or for a new build under the '1% for Art' scheme. Assignments may include production of trophies or prizes for a real or simulated live assignment, production of work for sale or as part of an enterprise or fund-raising project. Small group working could be used to work on a mural for a client or in a collaboration with a client. Putting this unit in a vocational context means giving learners the opportunity to meet practitioners and to see them at work in their studios or talking about their work at a selling event or exhibition.

Vocational learning support resources:

- Learning and Skills Network – www.vocationallearning.org.uk

Business and finance advice:

- local and regional Business Link – www.businesslink.gov.uk

Creative and Cultural Skills (www.ccskills.org.uk), the sector skills council for design have launched the web portal Creative Choices (www.creative-choices.co.uk). This portal has a range of information about careers in the design sector, including job descriptions.

Indicative reading for learners

Textbooks

Grey M – *Paper, Metal and Stitch* (Batsford Ltd, 2007) ISBN 978-0713490671

Lefteri C – *Materials for Inspirational Design* (RotoVision, 2006) ISBN 978-2940361502

Parnes T – *Jewelry and Accessories from Everyday Objects* (Creative Publishing International, 2007) ISBN 978-1589233270

Pipes A – *Drawing for Designers* (Laurence King Publishing, 2007) ISBN 978-1856695336

Polster B – *The A-Z of Modern Design* (Merrell Publishers Ltd, 2006) ISBN 978-1858943305

Searle T – *Easy Felted Accessories* (Search Press Ltd, 2006) ISBN 978-1844481736

Searle T – *Fabric Jewellery: 25 Designs to Make Using Silk, Ribbon, Buttons and Beads* (A&C Black, 2003) ISBN 978-0713686432

Journals

A-n Artist newsletter

Ceramic Review

Craft (published by the Crafts Council)

Selvedge magazine

Websites

www.artscouncil.org.uk	The national development agency for the arts in the UK
www.craftscouncil.org.uk	The national development agency for contemporary crafts in the UK
www.designnation.co.uk	Resources for design, craftwork, textiles and fashion
www.the-artists.org	Resources on contemporary arts and artists
www.thedesigntrust.co.uk	Resources for designers

Delivery of personal, learning and thinking skills

The table below identifies the opportunities for personal, learning and thinking skills (PLTS) that have been included within the pass assessment criteria of this unit.

Skill	When learners are …
Independent enquirers	identifying people and areas to research planning and carrying out research to support their project analysing and evaluating the information found, making annotations in sketchbook, making choices about what to use justifying why their design ideas have changed exploring the needs of the end user or client constraints
Creative thinkers	generating ideas and possibilities asking questions about research or new techniques and materials connecting their own and others' ideas and experiences in inventive ways trying out alternatives, following designs through adapting ideas as circumstances change
Reflective learners	self-assessing, peer assessing, identifying opportunities and achievements setting goals with success criteria to develop own work reviewing own progress and following targets dealing with feedback and praise, responding positively to critiques evaluating own learning, use feedback for learning communicating in different ways for different audiences
Team workers	collaborating with others – either on research, critiques or in design teams providing constructive support and feedback to others in peer reviews
Self-managers	seeking out challenges or new responsibilities and show flexibility when priorities change working towards goals showing initiative, commitment and perseverance organising time and resources, prioritise actions anticipating, take and manage risks (in design work) responding positively to change as ideas develop managing own emotions and building and maintaining relationships during the project
Effective participators	discussing issues of concern, seeking resolution when needed proposing practical ways forward, breaking these into manageable steps.

Although PLTS are identified within this unit as an inherent part of the assessment criteria, there are further opportunities to develop a range of PLTS through various approaches to teaching and learning.

Skill	When learners are …
Independent enquirers	using primary and secondary sources to initiate research planning and carrying out research to support their project analysing and evaluating the information found demonstrating their thought process through annotations in sketchbook, making choices about what to use and what information is not relevant justifying why their design ideas have changed in their sketchbooks exploring the needs of the end user or client constraints such as materials to use, purpose and scale
Creative thinkers	generating initial ideas and possibilities asking questions about research or new techniques and materials connecting their own and others' ideas and experiences in inventive ways trying out alternatives, following designs through adapting ideas as circumstances change and problem solving
Reflective learners	self-assessing, peer assessing, identifying opportunities and achievements setting goals with success criteria to develop own work reviewing own progress and following targets dealing with feedback and praise, responding positively to critiques evaluate own learning, using feedback for learning communicating learning in different ways for different audiences
Team workers	collaborating with others, either on research, critiques or in design teams providing constructive support and feedback to others in peer reviews
Self-managers	seeking out challenges or new responsibilities and show flexibility when priorities change working towards goals showing initiative, commitment and perseverance organising time and resources, prioritising actions anticipating, taking and managing risks (in design work) responding positively to change as ideas develop managing own emotions and building and maintaining relationships during the project
Effective participators	discussing issues of concern, seeking resolution when needed proposing practical ways forward, breaking these into manageable steps.

Functional Skills – Level 2

Skill	When learners are …
ICT – Use ICT systems	
Select, interact with and use ICT systems independently for a complex task to meet a variety of needs	using the internet or online journals for research. Selecting appropriate sources
Use ICT to effectively plan work and evaluate the effectiveness of the ICT system they have used	completing action plans and schedules using ICT
Manage information storage to enable efficient retrieval	using memory sticks and MP3 to store project work, research or evaluation
Follow and understand the need for safety and security practices	working safely following guidelines for rest and sitting positions. Adhering to school/college guidelines on internet use.
Troubleshoot	understanding how to resolve simple issues within work, know when to ask for help
ICT – Find and select information	
Select and use a variety of sources of information independently for a complex task	making choices about information to be used, reword, rewrite rather than print off information for research
Access, search for, select and use ICT-based information and evaluate its fitness for purpose	making notes of websites visited and acknowledge sources and authors.

Unit 10: Application of Welding Processes

Unit reference number: K/600/0412
Level 2: BTEC Firsts
Credit value: 10
Guided learning hours: 60

Aim and purpose

This unit aims to give learners the knowledge and skills they need to safely carry out a range of welding techniques and to test welded joints for defects and irregularities.

Unit introduction

Welding is frequently used in manufacturing engineering to ensure that permanent, high-quality joints are made between metal **parts or components**. This unit gives learners with little or no previous welding experience the opportunity to gain knowledge and understanding of the processes used throughout industry. This applies to a diverse number of engineering industries including those involving sheet metal, structural steel fabrication and motor vehicle bodies.

Learners will develop knowledge of the importance starting with the preparation of their work area, ensuring that health and safety legislation and safe working practices are understood and adhered to at all times. Learners will select appropriate welding equipment and check that it is in a safe and usable condition before welding. This is particularly important as learners will be working with electric currents or combustible gas mixtures.

Learners will be expected to interpret written, graphical and verbal instructions while carrying out practical tasks. They will become competent in using a fusion welding process through tutor-led demonstrations and supervised practise.

Continuous assessment should be carried out to ensure that learners' skill levels are improved to meet the required standard. To measure their competence, learners will test their welded joints with reference to European quality standards, ensuring that they are able to produce acceptable welds as well as recognise them. This will be reinforced with the use of destructive and non-destructive tests.

Learning outcomes

On completion of this unit a learner should:

1 Know about health and safety legislation and safe working practices when welding

2 Be able to prepare for work in a welding environment

3 Be able to produce joints to welding standards

4 Be able to perform destructive and non-destructive tests on welded joints.

Unit content

1 Know about health and safety legislation and safe working practices when welding

Legislation: aspects relevant to welding eg Health and Safety at Work Act, Fire Precautions Act, Control of Substances Hazardous to Health (COSHH), Provision and Use of Work Equipment Regulations (PUWER), Health and Safety (First Aid) Regulations, Manual Handling Operations Regulations

Safe working practices: fire prevention; accident prevention and reporting; risk assessment; fuses; circuit breakers; earthing of equipment; manual handling eg materials, safe handling of gas cylinders; checking conditions eg gas leaks, voltage and amperage, leads; personal protective equipment (PPE); ventilation and extraction; closing down equipment safely; storing equipment; safe disposal of waste materials; emergency procedures eg within the learning environment, workplace; common hazards associated with welding eg fumes, burns, radiation, electric shock

2 Be able to prepare for work in a welding environment

Tools and equipment: equipment availability eg cables, hoses, torches/electrode holders, gas pressure regulators, flow meters; assembling welding equipment eg cables, weld return clamps, electrode holders, gas supplies, safety devices; setting and adjusting welding conditions eg gas pressures/flow rates, voltage, amperage; connecting the weld return lead

Information sources: safety instructions; job instructions; engineering drawings; quality control documentation eg weld procedure specification, record/reporting sheet

Welding: processes eg oxy-acetylene, manual metal arc (MMA), metal inert gas (MIG), metal active gas (MAG), cored wire, tungsten inert gas (TIG), plasma-arc

Consumables: storage of consumables; consumables appropriate for welding processes eg:

- for MMA: eg rutile, basic, nickel alloy, cellulosic, stainless steel, other electrodes
- for MIG, MAG and cored wire: eg two wire types from different groups, two different shielding gases where applicable
- for TIG, plasma-arc: eg one size of electrode, two types of filler wire from different material groups
- for gas welding: oxygen; acetylene; filler wire eg two different sizes, two different material groups

3 Be able to produce joints to welding standards

Safety: fire prevention; accident prevention and reporting; risk assessment; manual handling; checking conditions eg gas leaks, voltage and amperage, leads; personal protective equipment (PPE); ventilation and extraction; closing down equipment safely

Welding positions: to British Standard (BS) EN 287 eg flat (PA), horizontal vertical (PB), horizontal (PC), vertical upwards (PF), vertical downwards (PG); welding technique eg torch and filler angles for various positions

Joints: producing joints using welding processes eg:

- for MMA, MIG, MAG and cored wire: a fillet and a butt weld
- for TIG, plasma-arc and gas welding: a butt weld and either a fillet weld or an autogenous weld (without filler wire)

Material: types eg carbon steel, stainless steel, aluminium; forms eg plate, section, pipe/tube, sheet metal less than 3mm thick

Quality standard: minimum weld quality equivalent to the level given in the relevant European/ International Standard eg BS EN ISO 5817 and BS EN ISO 10042; meeting the required dimensional accuracy within the specification

4 Be able to perform destructive and non-destructive tests on welded joints

Weld testing: safety when using test equipment and chemicals; visual inspection for defects and irregularities; non-destructive eg visual, dye penetrant, fluorescent particle, magnetic particle; destructive eg macroscopic examination, nick break (fracture) tests, bend tests; non-thermal specimen removal processes eg hand saws, power saws, abrasive discs; specimen preparation processes eg removing slag, spatter and surface irregularities, cleaning, degreasing, polishing, making saw cuts in welds to be fracture tested; typical defects; consequences of defects; recording and reporting of weld defects

Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

Assessment and grading criteria					
To achieve a pass grade the evidence must show that the learner is able to:		**To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:**		**To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:**	
P1	outline the health and safety legislation and safe working practices used in a welding environment	**M1**	describe common hazards that may occur in a welding environment	**D1**	analyse the cause of weld defects, suggest a remedy for three defects that can be found in a welded joint
P2	select the tools, equipment and information needed when materials are to be joined by welding [SM3]	**M2**	identify by visual examination the features that affect the quality of two welded joints	**D2**	evaluate the advantages and disadvantages of using a destructive or non-destructive test on a welded joint.
P3	prepare a list of consumables which are needed for a welding process	**M3**	explain the procedure used during a destructive or non-destructive test.		
P4	produce two joints safely and to a required quality standard using different welding positions [SM3]				
P5	produce two joints safely and to a required quality standard using different types of joint [SM3]				
P6	perform two destructive and two non-destructive tests and record the test outcomes. [IE1, SM3]				

PLTS: This summary references where applicable, in the square brackets, the elements of the personal, learning and thinking skills applicable in the pass criteria. It identifies opportunities for learners to demonstrate effective application of the referenced elements of the skills.

Key			
	IE – independent enquirers	RL – reflective learners	SM – self-managers
	CT – creative thinkers	TW – team workers	EP – effective participators

Essential guidance for tutors

Delivery

This unit should be delivered using tutor-led demonstrations followed by practical tasks, during which learners can gain experience of working with appropriate tools and equipment. Underpinning knowledge could be delivered using practical demonstrations supported by classroom based sessions focusing on specific theoretical aspects of the processes used.

Tutors must ensure that learners understand the hazards and safe working practices associated with welding equipment before they are allowed to use the process. Learners should be introduced to the process using a series of graded, formative tasks to enable them to demonstrate their competence before attempting the summative tasks.

Learners should be encouraged to evaluate their performance through formative tasks using a combination of tutor and self/peer assessment. Learners should be provided with appropriate feedback, both formative and summative, to further encourage their development. The early introduction of weld testing in the workshop will encourage discussion and self assessment, enabling learners to improve weld quality by making adjustments to process parameters.

The learning outcomes are ordered to enable learners to develop an understanding of the fundamental stages involved in the production of welded joints, irrespective of the process used. Job instructions should be written in a logical format, that will lead learners to consider all aspects of the task from safety, selection of tools, equipment and materials, process set-up and operation, through to production and testing of the welded joint.

Summative tasks will assess learners' competence in the use of the welding process and technique and their ability to control process parameters to produce welds that meet a specified quality standard.

Work-based learners should be encouraged to relate to the processes and techniques used at their place of work and also the wider perspective of welding processes used in industry. Centres should relate tasks to the needs of local industries to prepare learners not currently employed with the appropriate skills and knowledge necessary to enter employment.

Note that the use of 'eg' in the unit content is to give an indication and illustration of the breadth and depth of the area or topic. As such, not all content that follows an 'eg' needs to be taught or assessed.

Outline learning plan

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments.

The outline learning plan demonstrates one way in planning the delivery and assessment of this unit.

Topic and suggested assignments/activities and/assessment
Whole-class teaching: • introduction to welding producing permanent joints • specific processes applicable to welding • health and safety related to welding and safe working practices.
Prepare for and carry out assignment 1 (P1, M1).
Whole-class teaching: • sources of information required and used when welding • selection of welding processes • theory of welding practice • tools and equipment required and used during welding.
Workshop practical session: • process selection • introduction to welding equipment used • preparation for use, shutdown procedures and storage of equipment.
Prepare for and carry out assignment 2 (P2, P3).
Whole-class teaching: • welding theory; techniques, joints, materials, positions • weld quality standards • visual inspection of welds and common defects and irregularities.
Workshop demonstrations followed by individual learner practice: • safety in welding workshops • welding basics – process specific • techniques in welding different joints • techniques in welding different materials • techniques in welding different positions • weld quality and visual inspection.
Prepare for and carry out assignment 3 (P4, M2, D1).
Whole-class teaching: • weld testing theory, visual, destructive and non-destructive • test standards • test procedures • methods of reporting.

Topic and suggested assignments/activities and/assessment
Workshop practical followed by individual learner practice: • preparation of joints for testing • testing of welded joints • reporting results of weld tests.
Prepare for and carry out assignment 4 (P5, P6, M3, D2).

Assessment

Achievement of the pass criteria will require evidence of the production of welded joints in a workshop environment and responses to questions, either oral, written or a combination of both. Observations carried out during practical sessions should evidence the learners understanding of health and safety legislation and safe working practices; however a written description would produce best evidence against this criteria (P1). In the event of a breach of health and safety or approved safe working practices, the assessment should be terminated.

Assessment and grading criteria P2 and P3 must be completed satisfactorily before proceeding with criteria P4 and P5. It is expected that observation will capture learners' performance when using these welding processes. On completion of the welded joints, it is recommended that learners carry out the mandatory visual inspection of the weld during P4 and P5. The outcome from these welding processes should compare with the quality standard required. The requirement for P6 can be achieved during or after the practical activities and could be listed as a separate task.

In order to document evidence of practical tasks, centres may wish to consider the use of a logbook or portfolio to record the processes and techniques used. The inclusion of photographic evidence, drawings and a written description of each stage of the task would enable learners to demonstrate their competence with regard to the tools and equipment. Health and safety legislation and working practices relative to the task should be included in each description, as well as references to the safe operation of specific tools and equipment.

To achieve a merit grade, learners will need to be able to identify common hazards that they must guard against when working in a welding environment (M1). Demonstration of this is best achieved through a written task. Visual inspection of welds will be used to identify the visual quality of a welded joint. Learners should be encouraged to recognise and note visual defects and vary their welding parameters and technique to improve the weld quality eg access, materials, type of joint, technique and process settings (M2) The learners knowledge of weld testing methods will be delivered and consolidated during practical sessions; however, learners should be given the opportunity to research the subject using written and information technology sources. The evidence for explaining the procedure for destructive and non-destructive tests (M3) will most likely be in the form of written answers to a focused task set by the tutor.

To achieve a distinction grade, learners will need to be able to understand the causes of weld defects, and the principles and applications of a range of weld testing techniques. D1 requires the learner to analyse the cause of weld defects. This follows on from the use of welding positions in P4 and the learners assessing the welds they have produced in M2. The evidence for D1 and D2 could include responses to oral questioning; however, at this level written answers to questions or tasks would be a more appropriate method of evaluating the learners understanding of weld testing techniques. Achievement of D2 is likely to depend on the learner's ability to satisfactorily perform the related tasks at P6 and M3.

Programme of suggested assignments

The table below shows a programme of suggested assignments that cover the pass, merit and distinction criteria in the assessment and grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Pearson assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1, M1	Safe Working Practices in Welding	An activity based assignment that requires learners to investigate and identify health and safety legislation and safe working practices within a welding workshop.	A report with appropriate references to the source of information. The report outlines the legislation and safe working practices applicable to the welding environment.
P2, P3	Preparing the Working Environment	An activity based assignment that encourages learners to consider and plan the work they do in a welding activity. To include tools, equipment, safety checks, consumables and the information required prior to starting a welding activity.	A plan outlining individual tasks which records the consumables, information, tools and equipment needed for the activity.
P4, M2, D1	Positional Welding and Visual Examination of Welds	A practical activity where welded joints are produced by the learner. The joints should be visually examined supported by a report that reviews the quality of the welds and identifies changes to the welding process or technique.	A practical producing the required welded joints. A quality report recording visual irregularities including photographs or diagrams supported by witness statements.
P5, P6, M3, D2	Testing of Different Types of Joint	A practical activity where the learner produces welded joints and tests them by using destructive or non-destructive test methods. The activity is supported by a reflective written activity.	A practical producing the required welded joints. A quality report recording the type of test and the test results, including photographs or diagrams and supported by witness statements.

Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

This unit forms part of the BTEC Engineering sector suite. This unit has particular links with the following units in the Engineering suite:

Level 1	Level 2	Level 3
	Fabrication Techniques and Sheet Metal Work	Applications of Welding Technology
		Welding Principles

This unit has links with the following units from the Level 2 SEMTA National Occupational Standards in Fabrication and Welding Engineering:

- Unit 4: Joining Materials by the Manual Metal Arc Welding Process
- Unit 5: Joining Materials by the Manual MIG/MAG and Other Continuous Wire Welding Processes
- Unit 6: Joining Materials by Manual TIG and Plasma-arc Welding Processes
- Unit 7: Joining Materials by the Manual Gas Welding Process
- Unit 8: Producing Fillet Welded Joints using a Manual Welding Process.

The unit also supports the Level 2 NVQ in Performing Engineering Operations, particularly:

- Unit 27: Preparing and Using Manual Metal Arc Welding Equipment
- Unit 28: Preparing and Using Manual TIG or Plasma-Arc Welding Equipment.
- Unit 29: Preparing and Using Manual MIG, MAG and other continuous Wire Welding Equipment
- Unit 30: Preparing and Using Gas Welding Equipment.

Essential resources

Centres delivering this unit will need access to appropriate welding equipment, consumables and materials as outlined in the unit. Centres must also have access to appropriate destructive and non-destructive test equipment.

Employer engagement and vocational contexts

The materials and processes used in the delivery of this unit should be in the context of the learners' workplace or based on case studies of local employers. Learners may benefit from industrial visits to provide an understanding of welding in an industrial context and to appreciate the range of processes and materials used in industry. Visits could also consider the modes of testing welds in industry to enhance the learning experience.

There are a range of organisations that may be able help centres engage and involve local employers in the delivery of this unit, for example:

- Work Experience/Workplace learning frameworks – Centre for Education and Industry (CEI University of Warwick) – www.warwick.ac.uk/wie/cei
- Learning and Skills Network – www.vocationallearning.org.uk
- Network for Science, Technology, Engineering and Maths Network Ambassadors Scheme – www.stemnet.org.uk
- National Education and Business Partnership Network – www.nebpn.org
- Local, regional Business links – www.businesslink.gov.uk
- Work-based learning guidance – www.aimhighersw.ac.uk/wbl.htm.

Indicative reading for learners

Textbooks

Jeffus L – *Welding Principles and Applications* (Delmar Learning, 2007) ISBN 1418052752

Timings R – *Fabrication and Welding Engineering* (Newnes, 2008) ISBN 978075066916

Delivery of personal, learning and thinking skills

The table below identifies the opportunities for personal, learning and thinking skills (PLTS) that have been included within the pass assessment criteria of this unit.

Skill	When learners are …
Independent enquirers	analysing the welds that they have completed to visually examine the quality of welds and identify weld irregularities
Self-managers	planning and organising their time and resources when selecting the correct tools, equipment and consumables and carrying out welding techniques.

Although PLTS are identified within this unit as an inherent part of the assessment criteria, there are further opportunities to develop a range of PLTS through various approaches to teaching and learning.

Skill	When learners are …
Creative thinkers	continuously exploring the effects of changing welding parameters and techniques generating ideas as to the cause of weld defects either by visual examination or destructive or non-destructive testing
Reflective learners	analysing the outcomes of changing welding parameters and techniques visually examining their weld samples for defects and irregularities and understanding their causes.

Functional Skills – Level 2

Skill	When learners are …
English	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	speaking and listening to peers and those supervising when reviewing the quality of welds produced, and the results of testing
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	selecting, reading and using appropriate sources of information during welding tasks eg job instructions, safety instructions, quality specifications
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	describing health and safety legislation and common hazards associated with welding planning and justifying the tools and equipment required for welding, and listing consumables writing a report to show the results of destructive or non-destructive tests.

Unit 11: Fabrication Techniques and Sheet Metal Work

Unit reference number: T/600/0414
Level 2: BTEC Firsts
Credit value: 10
Guided learning hours: 60

Aim and purpose

This unit aims to give learners the knowledge and skills needed to safely measure, mark out, cut, form and assemble fabricated structures using sheet metal.

Unit introduction

This unit gives learners with no previous experience of fabrication or sheet metal work an opportunity to work with the principles, materials and processes used in industry.

Learners will perform a range of practical tasks which may include the use of metallic and non-metallic materials. Different types of materials will be used including sheet, plate and sections. At each stage in the process learners will select appropriate hand and machine tools and check that they are properly prepared for use and in a safe condition.

The process starts with marking out an accurate pattern. The material's properties may influence the location of the shape on its surface so the underpinning knowledge provides an informed approach to marking out procedures.

The next stage requires the material to be cut to the correct shape and size. An appropriate forming process is then required to produce a three-dimensional shape according to the job specification. Assembly of the components will be carried out using mechanical, thermal or adhesive joining processes. Continuous assessment will be carried out to ensure that the learners' skills are developed enabling them to work to a required standard, and to the tolerances in a given specification.

This unit is appropriate for learners who are employed or are being prepared for employment in an industrial environment where fabrication and sheet metal work are an integral part of a manufacturing process.

Learners will be expected to demonstrate an understanding of their responsibilities in terms of both health and safety and organisational practices and procedures within the fabrication industry. The unit will help learners understand the safety precautions required when working with fabrication tools and machinery.

Learning outcomes

On completion of this unit a learner should:

1 Know the safe working practices used in a fabrication workshop and relevant health and safety legislation

2 Be able to measure and mark out materials for fabricated structures

3 Be able to cut and form materials safely in a sheet metal fabrication environment

4 Be able to join and accurately assemble fabricated structures.

Unit content

1 Know the safe working practices used in a fabrication workshop and relevant health and safety legislation

Safe working practices: general workshop and site safety eg equipment set-up and shut down, guarding of machinery and power tools, manual handling of sheet metal, plate and rolled section materials, personal protective equipment (PPE), burrs on sheet materials, slips, trips and falls; when using processes eg marking out mediums, working with laser marking out equipment, lifting long and heavy components, cutting materials; general maintenance, action to be taken when tools and equipment are dangerous or poorly maintained, maintenance and use of compressed air and electric power tools; safe disposal of waste materials

Legislation: aspects applicable to fabrication and sheet metal work eg Health and Safety at Work Act 1974, Control of Substances Hazardous to Health (COSHH) regulations 2002, Supply of Machinery (Safety) Regulations 1992 Provision and Use of Work Equipment Regulations (PUWER) 1998, Health and Safety (First Aid) Regulations 1981, Manual Handling Operations Regulations 1992, Lifting Operations and Lifting Equipment Regulations 1998, Personal Protective Equipment at Work Regulations 1992, Control of Noise at Work Regulations 2005

2 Be able to measure and mark out materials for fabricated structures

Measuring and marking out: measuring tools eg rule, tape rule, protractor, height gauge; marking out tools eg scriber, centre punch, chalk line, square, trammel, dividers, templates, surface plate, chalk, blueing or paint; features eg datum lines and centre lines, square and rectangular profiles, circles, curved profiles, cutting detail, hole centring and circular and linear outlining; laser measuring and marking equipment; calibration of equipment; quantity eg single 'one off' components and batch production

Material types: forms of supply; sheet, plate or section materials eg hot-rolled black, cold-rolled; thickness up to and including 3 mm; range of material types appropriate to assembly eg bar and section lengths and profiles, cutting detail for flat covers and plates, frames or structures, fish plates, gussets, spars and brackets, pipe and tube sections, structural support pads, bed plates, columns, beams or struts, simple seatings (boiler saddles and tank cradles)

Materials: metallic (ferrous and non-ferrous) eg mild steel, tinned steel, galvanised steel, aluminium, stainless steel, brass, copper; non-metallic eg plastics and rubbers, common forms eg sheet, extrusions and mouldings, uses in fabricated assemblies eg seals, gaskets, trims, panels and screens

3 Be able to cut and form materials safely in a sheet metal fabrication environment

Cutting: hand tools eg tin snips, hacksaw, files; hand power tools eg drill, nibbler; machine tools eg bench shears, guillotine, band saw, pillar drill, punching and cropping machines; operations eg straight cuts, external curved contours, round holes; cutting action of hand tools and machinery eg shear and material removal (filing and drilling)

Forming: tools and equipment eg hammers, mallets, stakes and formers, hand or powered bending machines, hand or powered rolling machine; safety checks on tools and equipment eg hammer shafts are secure, striking faces on stakes and formers are free from defects and damage, machine guards and safety devices, forming tools; operations eg bends, folds, curved panels, cylindrical sections, ducting or trunking

4 Be able to join and accurately assemble fabricated structures

Joining processes: permanent and non-permanent joints, thermal eg temporary tack welding, soldering or brazing, resistance spot welding; mechanical fasteners eg hollow or solid riveting, self piercing rivets, threaded inserts, structural fasteners, bolts, screws; adhesives eg structural adhesives, epoxides, acrylics and their toughened variants

Assemblies: type of assembly eg frames, tanks, ducting, guards, hoods, panels, sectional trunking, square, rectangular and box sections, cylindrical sections, conical sections, reduction pieces; types of components in the assemblies eg sheet metal covers, pre-fabricated square and rectangular components, pre-fabricated cylindrical and conical components, brackets, flanges, pipes, light rolled angle, channel or tee section

Quality and accuracy standards: understand achievable tolerances in respect of the type of material, joining, and assembly processes; correctly assemble and align in accordance with the specification; overall dimensions are within specification tolerances; overall dimensions are within geometric tolerances eg square, straight, angles free from twists, pitches of erection holes meet specification requirements, assemblies have secure and firm joints; clean and free from burrs and sharp edges

Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

Assessment and grading criteria					
To achieve a pass grade the evidence must show that the learner is able to:		**To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:**		**To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:**	
P1	describe safe working practices used in the fabrication industry and identify relevant health and safety legislation	**M1**	explain the roles and responsibilities of employers and their employees in the application of health and safety legislation applicable to the fabrication industry	**D1**	analyse a pattern that has been marked out and suggest a method of marking out a large quantity of these parts for fabrication
P2	measure and mark out different types of material for a fabricated structure [SM3]	**M2**	explain the cutting action of one machine and one hand tool which may be used in the production of sheet metal fabrications.	**D2**	compare and discuss the advantages and disadvantages of using a permanent and a non-permanent joint when joining sheet metal and sectional materials.
P3	demonstrate the safe use of cutting and forming equipment in the production of two sheet metal fabrications [SM3, SM4]				
P4	use a given quality standard to accurately join and assemble materials to produce a fabricated structure. [IE4, SM3]				

PLTS: This summary references where applicable, in the square brackets, the elements of the personal, learning and thinking skills applicable in the pass criteria. It identifies opportunities for learners to demonstrate effective application of the referenced elements of the skills.

Key			
	IE – independent enquirers	RL – reflective learners	SM – self-managers
	CT – creative thinkers	TW – team workers	EP – effective participators

Essential guidance for tutors

Delivery

This unit should be delivered using tutor-led demonstrations followed by practical tasks during which learners can gain experience of working with the appropriate tools and equipment. Learners will benefit from understanding the value of working with sheet and sectional materials in order to produce a quality product.

Learning outcome 1 should be embedded in tutor-led demonstrations and reinforced through continuous observation and assessment. Learners must understand the health and safety requirements and responsibilities of those working in industry, including risk assessment of potential hazards.

Learners will be given the opportunity to use a range of different techniques in each of the four areas within the fabrication process, ie measuring and marking out, cutting, forming and joining. Underpinning knowledge can be delivered through a combination of practical demonstrations and classroom-based sessions focusing on the theoretical aspects of the processes and techniques.

Learners will perform a range of tasks designed to improve their knowledge and understanding of the tools and materials used in an industrial environment. Formative tasks should be short and progressive to ensure that learners are both competent and confident in their ability to proceed to the next stage of the process. Learners should be encouraged to evaluate their performance by completing formative tasks which may be self or peer assessed. This should be reinforced with appropriate formative feedback from the tutor.

The summative tasks will include techniques and processes from the four outlined areas. When learners have achieved the required level of knowledge and skill in a given area they should complete relevant summative tasks before moving to the next formative stage progressing through each area of the process. This allows the learner to achieve learning outcomes as soon as possible as knowledge and skills are acquired, which permits their increasing competence to be demonstrated.

Work-based learners should be encouraged to relate the learning outcomes to the processes and techniques used at work, but they should also gain knowledge and skills in the fabrication processes used throughout the industry. Centres should relate tasks to the needs of local industries to prepare learners not currently employed so that they enter employment with the appropriate skills and knowledge.

Note that the use of 'eg' in the unit content is to give an indication and illustration of the breadth and depth of the area or topic. As such, not all content that follows an 'eg' needs to be taught or assessed.

Outline learning plan

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments.

The outline learning plan demonstrates one way in planning the delivery and assessment of this unit.

Topic and suggested assignments/activities and/assessment
Whole-class teaching and workshop session: • induction into workshops and general safety and emergency procedures • identify specific processes used in the fabrication and sheet metal work industries.

Topic and suggested assignments/activities and/assessment
Class taught session: • explain safe working practices • identify health and safety legislation related to fabrication and sheet metal working environments.
Prepare and carry out assignment 1 (P1, M1)
Class taught session: • stock material types – sheet, tube, sections, plate • types of material, metallic, non-metallic • tools and equipment required when measuring and marking out.
Workshop practical session: • measurement techniques and tools • marking of sheet, tube and sectional materials as used in industry • marking out according to material type and surface form.
Prepare for and carry out assignment 2 (P2, D1)
Class taught session: • safety when using cutting tools and machinery • cutting tools types of hand operated, power tools, and machines • tool maintenance • tool set up, consumables and use • cutting action – shear, materials removal.
Workshop practical followed by individual learner practice: • safety in the workshop when using cutting equipment • correct tool set up and maintenance • material characteristics when cutting • cutting external profiles • cutting internal profiles and shapes • cutting of sheets and sections – blanking, cropping.
Class taught session: • safety when using forming tools and machinery • bending and folding theory, types of machine • use of rolling machinery • forming with hammers and mallets.
Workshop practical followed by individual learner practice: • safety in the workshop when using forming equipment • bending and folding – safety, set up, maintenance, springback • rolling – safety, set up, maintenance • hand power tools used for forming operations • manual forming processes – hammers, mallets stakes and formers.
Prepare for and carry out assignment 3 (P3, M2)

Topic and suggested assignments/activities and/assessment
Class taught session: • safety in the workshop and in industry during assembly • thermal joining processes • mechanical fastening • adhesives • types of assembly and best use of materials • quality standards – dimensional accuracy, tolerances and geometrical tolerances • recording and interpreting accuracy and tolerances.
Workshop practical followed by individual learner practice: • preparation of joints for assembly • safe joining and assembly techniques • joining materials – thermal, mechanical and bonding with adhesives • working to specifications and checking assembled components.
Prepare for and carry out assignment 4 (P4, D2).

Assessment

To achieve all pass criteria learners will need to demonstrate their skills using all four stages of the fabrication process. Learners will use their knowledge and understanding to produce a fabricated assembly using sheet materials (P4) using thermal and mechanical joining processes and techniques. The criteria P2 and P3 should occur naturally if the tasks are designed around the range of processes and materials identified in the unit content.

Some of the evidence will be in the form of tutor observation and oral questioning from practical sessions. To provide evidence of knowledge and understanding of the criteria, centres could also consider the use of a logbook or portfolio to record the processes and techniques used to perform the tasks. The inclusion of photographic evidence, drawings and a written description of each stage of the task would enable learners to demonstrate their competence with regard to using tools and equipment. Health and safety legislation and working practices (P1) relative to the task should be included in each description plus references to the safe operation of specific tools and equipment.

To achieve a merit grade, learners will need to demonstrate their understanding of health and safety legislation as it applies to those working in the fabrication industry. Learners will also be able to explain the cutting action of specific tools. They will need knowledge of the principles of the shearing process, and material removal processes such as drills and files. Learners' knowledge of hand tools, power tools and machinery used for cutting will be covered during practical sessions. However, they should be given the opportunity to research the subject using both written and information technology sources. The evidence for each of the merit criteria is most likely to be in the form of written answers to a focused task set by the tutor.

To achieve a distinction grade, learners need to demonstrate an understanding of the principles and applications of the marking out and joining methods used in the fabrication of sheet metal and sheet metal assemblies. Learners can do this by explaining the advantages and disadvantages of using permanent and non-permanent joining methods and the alternative methods of marking out. Tutors will need to be satisfied that the learners' work is distinctive based on the written answers to set questions or tasks.

Programme of suggested assignments

The table below shows a programme of suggested assignments that cover the pass, merit and distinction criteria in the assessment and grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Pearson assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1, M1	Working Safely in the Fabrication Industry	Learners have been asked to produce a report on safety in the fabrication workshop.	A report with appropriate references to the source of information. The report outlines the legislation and safe working practices applicable to the sheet metal fabrication industry.
P2, D1	Measuring and Marking Out	Learners are given guidelines in order to measure and mark out materials using standard tools and equipment. This is done in preparation for cutting and forming a fabricated structure.	A practical activity for which learners mark out different types of materials accurately and using appropriate tools and equipment. A short report that considers methods of marking out a quantity of components.
P3, M2	Cutting and Forming	Learners produce two sheet metal fabrications using the materials already marked out.	A demonstration that requires the learner to cut materials having selected appropriate equipment. The learner will also form the materials having set up and used the equipment correctly. All areas of this assessment should be performed in a safe manner. A report or presentation should be used to identify one hand tool and one machine that are used in the cutting of sheet metal and other fabrication materials. The learner will explain, in detail, the cutting action that is used in each case.
P4, D2	Joining and Assembly	Learners work to a given quality standard so that joining techniques are used to produce fabrications and assemblies. It would be beneficial if this activity uses the materials formed in P3.	A practical where the learner will produce an accurate assembly to given tolerances. The learner will use a combination of permanent and non-permanent joining methods in the form of mechanical fastenings, adhesives or thermal joining processes. The specification should include a checklist for dimensional accuracy and geometric and dimensional tolerances. A report will be used to compare a permanent and non-permanent method of joining sheet metal materials. This will be used to discuss the advantages and disadvantages of both.

Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

This unit forms part of the BTEC Engineering sector suite. This unit has particular links with the following units in the Engineering suite:

Level 1	Level 2	Level 3
	Engineering Marking Out	Fabrication Processes and Technology

This unit has links with the SEMTA National Occupational Standards and can contribute towards the knowledge and understanding required for the Level 2 NVQ in Fabrication and Welding Engineering, particularly:

- Unit 21: Marking Out Components for Fabrication
- Unit 22: Cutting Sheet Metal to Shape using Hand and Machine Tools
- Unit 23: Forming Sheet Metal using Hand and Machine Tools
- Unit 24: Producing Sheet Metal Assemblies
- Unit 29: Bonding Engineering Materials using Adhesives.

The unit also links with Unit 22: Producing Sheet Metal Components and Assemblies from the Level 2 NVQ in Performing Engineering Operations.

Essential resources

To deliver this unit it is essential that centres have access to the relevant tools, machinery and safety equipment listed in the unit content. Centres will need to ensure that they have sufficient hand tools, power tools and machines to enable all learners to perform the tasks individually.

Employer engagement and vocational contexts

The use of vocational contexts is essential in the delivery and assessment of this unit. Where learners are employed the materials and processes used should be in the context of the learners' workplace, or may be based on case studies of local employers for those preparing for employment. Learners may benefit from industrial visits to provide an understanding of fabrication techniques and sheet metal work in an industrial context, and to appreciate the range of processes and materials used in industry.

There are a range of organisations that may be able help centres engage and involve local employers in the delivery of this unit, for example:

- Work Experience/Workplace learning frameworks – Centre for Education and Industry (CEI University of Warwick) – www.warwick.ac.uk/wie/cei
- Learning and Skills Network – www.vocationallearning.org.uk
- Network for Science, Technology, Engineering and Maths Network Ambassadors Scheme – www.stemnet.org.uk
- National Education and Business Partnership Network – www.nebpn.org
- Local, regional Business links – www.businesslink.gov.uk
- Work-based learning guidance – www.aimhighersw.ac.uk/wbl.htm.

Indicative reading for learners

Textbooks

Kenyon W – *Basic Welding and Fabrication* (Longman, 1987) ISBN 978-0582005365

Robinson A – *The Repair of Vehicle Bodies* (Butterworth-Heinemann, 2006) ISBN 978-0750667531

Wakeford R E – *Sheet Metal Work* (Special Interest Model, 1987) ISBN 978-0852428498

Delivery of personal, learning and thinking skills

The table below identifies the opportunities for personal, learning and thinking skills (PLTS) that have been included within the pass assessment criteria of this unit.

Skill	When learners are …
Independent enquirers	analysing and evaluating information in quality standards to join and assemble materials
Self-managers	organising time and resources and prioritising actions when measuring, marking out, cutting and forming materials.

Although PLTS are identified within this unit as an inherent part of the assessment criteria, there are further opportunities to develop a range of PLTS through various approaches to teaching and learning.

Skill	When learners are …
Creative thinkers	assembling a fabricated structure to a required quality standard.

Functional Skills – Level 2

Skill	When learners are …
Mathematics	
Identify the situation or problem and the mathematical methods needed to tackle it	working with guideline dimensions whilst measuring and marking out
Interpret and communicate solutions to practical problems in familiar and unfamiliar routine contexts and situations	working with dimensional and geometric tolerances and assessing inaccuracies
English	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	speaking and listening to peers and tutors in a range of contexts applicable to the process of sheet metal fabrication
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	reading and interpreting information in guidelines, quality standards and safety related text to complete summative and formative tasks
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	writing of reports to effectively communicate an understanding of current health and safety legislation.

Unit 12: Working with Blacksmithing Specifications and Calculations

Unit reference number: L/502/7608
Level 2: BTEC First
Credit value: 5
Guided learning hours: 30

Aim and purpose

The aim of this unit is to provide the learner with numeracy knowledge and practical skills in the context of blacksmithing and metalworking. It is designed primarily for learners in centre-based programmes of study who wish to progress to employment or further study in blacksmithing and metalworking.

Unit introduction

One of the key abilities of blacksmiths and metalworkers is to work accurately with measurements and calculations and to solve relevant problems effectively. This unit will enable learners to use ratios, units of measurement, conversions and mathematical problems when working in a blacksmithing environment.

Learners will develop their knowledge of areas and scale and how to use ratios and standard formulae to solve surface areas and volumes. They will learn how to apply them to common blacksmithing work projects and practices.

Learning outcomes

On completion of this unit a learner should:

1 Know the uses of blacksmithing specifications and calculations

2 Be able to work with blacksmithing specifications and calculations

Unit content

1 Know the uses of blacksmithing specifications and calculations

Ratios and units of measurement: Pi; metric; imperial; 3-4-5 triangles; length; breadth; thickness; diameter; degrees/minutes; weight; scale; tolerances

Conversion factors: metric to imperial, volume to weight, area, length, scale.

Mathematical formulas: area square/round, area times length, tapers (eg complete, truncated)

Area, weight, volume, angle: areas eg square, oblong, round; weights eg square, oblong, round; volumes eg square, oblong, round; dimensions (angles, length, width, thickness)

2 Be able to work with blacksmithing specifications and calculations

Measurements: calculation; equipment (rulers, tapes, soft wire, angle finders, centre finders); ratios eg 3-4-5 triangles, equilateral triangles, diagonals; heat expansion; mean line measurement; compound error; use of datum lines; wastage and compaction during forging; punching and drifting during forging; internal and external measurement

Calculation of forged lengths and sections: simple sections; complex sections; transitions eg parallel to tapered, sets; straight and bent; scale conversions

Calculation of starting sections and lengths: measurement; calculation; estimations; wastage and compaction; selection of forging methods

Marking out: temporary marks eg engineer's chalk, scribing; permanent marks eg centre punching, number/letter punches, chisel lines; datum lines; drawing transfer; working drawings; annotations; measuring equipment

Working within specification: square; level; transitions; bending; jointing; sections

Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

Assessment and grading criteria		
To achieve a pass grade the evidence must show that the learner is able to:	**To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:**	**To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:**
P1 use ratios and units of measurement to express values	**M1** describe the selection of ratios, units of measurement and mathematical formulae appropriate to a given blacksmithing project	**D1** explain in detail the marking out and calculations used for a given blacksmithing project.
P2 use conversion factors to convert measurement values from one unit of measurement to another		
P3 define the mathematical formulae for: ◊ area of square and round sections ◊ volume of square and round parallel sections ◊ volume of square and round tapered sections ◊ circumference		
P4 calculate and measure: ◊ areas of squares and rounds ◊ weights of squares and rounds ◊ volumes of squares, rounds, cones, pyramids ◊ angles		

Assessment and grading criteria		
To achieve a pass grade the evidence must show that the learner is able to:	**To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:**	**To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:**
P5 use appropriate methods and equipment to carry out a measuring task	**M2** accurately work with specifications and calculations in relation to given blacksmithing project work.	
P6 describe factors that can distort measurements and accuracy of final forged outcomes [IE]		
P7 calculate forged lengths and sections [TW]		
P8 calculate starting sections and lengths describing an appropriate forging method		
P9 use marking out and measuring methods to produce an example of forged ironwork [EP]		
P10 work within specification to produce forged ironwork to set tolerances. [SM]		

PLTS: This summary references where applicable, in the square brackets, the elements of the personal, learning and thinking skills applicable in the pass criteria. It identifies opportunities for learners to demonstrate effective application of the referenced elements of the skills.

Key			
	IE – independent enquirers	RL – reflective learners	SM – self-managers
	CT – creative thinkers	TW – team workers	EP – effective participators

Essential guidance for tutors

Delivery

Delivery of this unit is likely to involve practical and theoretical learning and assessment.

Tutors delivering this unit have opportunities to use as wide a range of techniques as possible. Lectures, site visits, supervised workshop practicals, research using the internet and/or library resources and the use of personal and/or industrial experience would all be suitable.

Whichever delivery methods are used, it is essential that tutors stress the importance of sound environmental management and the need to manage the resource using legal methods.

Health and safety issues relating to working in the forge environment must be addressed and reinforced regularly, and risk assessments must be undertaken before practical activities. Adequate PPE must be provided and used following the production of suitable risk assessments.

Tutors should consider integrating the delivery, private study and assessment for this unit with other relevant units and assessment instruments that learners are taking as part of their programme of study.

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments.

The outline learning plan gives an indication of the volume of learning it would take the average learner to achieve the learning outcomes. It is indicative and is one way of achieving the credit value.

Learning time should address all learning (including assessment) relevant to the learning outcomes, regardless of where, when and how the learning has taken place.

Outline learning plan

Topic and suggested assignments/activities and/assessment
Introduction and overview of the unit.
Learners investigate the use of ratios and units of measurement during bespoke lectures and supervised practical sessions.
Learners develop knowledge of the use of formulae in practical situations.
Assignment 1: Using Blacksmithing Specifications and Calculations
Learners demonstrate the use and knowledge of ratios and measurements using given subjects.
They investigate subject dimensions and use formulae to calculate unknown figures.
Learners develop their abilities to use measurements and calculations on given forged project work.
Assignment 2:Working with Blacksmithing Specifications and Calculations
Learners use methods and equipment to carry out measuring and marking tasks within the context of a blacksmithing project.

Assessment

For P1, P2, P3 and P4 learners must demonstrate the use of calculations and formulas. Evidence could take the form of an assignment together with witness statements and/or a logbook.

For P5, P6, P7, P8, P9, P10 and M2 learners need to apply their mathematical knowledge to a given blacksmithing project. Evidence is likely to be in the form of a portfolio of evidence, including recorded working out and witness statements/observation records.

For M1, learners need to provide a description of how they have employed mathematical measurements and calculations in a given project. They need to show why they have selected each mathematical feature. Evidence could be in the form of a presentation, question and answer session or assignment.

For D1 learners need to demonstrate their knowledge of specifications and calculations by explaining in detail how these have been used in the context of a given project or projects. Learners must show that they have fully comprehended how key mathematical formulae have underpinned the success of project work.

Programme of suggested assignments

The following table shows a programme of suggested assignments that cover the pass, merit and distinction criteria in the grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Pearson assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1, P2, P3, P4, M1	Using Blacksmithing Specifications and Calculations	As a trainee blacksmith you are involved in a forgework project and need to use ratios and measurements in preparation.	Assignment
P5, P6, P7, P8, P9, P10, M2, D1	Working with Blacksmithing Specifications and Calculations	You will carry out the forgework project and in doing so use methods and equipment to measure and mark out your work.	Assignment Project

Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

This unit forms part of the BTEC land-based sector suite. This unit has particular links with:

Level 2	Level 3
2D Visual Communication	Undertake Small Scale Design for Blacksmithing and Metalworking
3D Visual Communication	Undertake Large Scale Design for Blacksmithing and Metalworking
Working with 3D Design Briefs	
Working with 3D Design Craft Briefs	

This unit has links with the following unit from the Level 2 SEMTA National Occupational Standards in Fabrication and Welding:

- Unit 21: Marking out components for fabrication.

Essential resources

Learners will need to access to appropriate measuring and marking-out equipment and an electronic scientific calculator.

Indicative reading for learners

Textbook

Liflander P – *Measurements and Conversions* (Running Press, 2003) ISBN 978-0762414567

Website

www.ehow.com	An online community dedicated to giving visitors the ability to research, share, and discuss instructional s olutions that help complete day-to-day tasks and projects

Delivery of personal, learning and thinking skills (PLTS)

The following table identifies the PLTS opportunities that have been included within the assessment criteria of this unit:

Skill	When learners are …
Independent enquirers	describing factors that could distort measurements and accuracy of final forged outcomes
Team workers	calculating forged lengths and sections
Self-managers	working within specification to produce an example of forged ironwork to set tolerances
Effective participators	marking out and using measuring methods to produce an example of forged ironwork

Although PLTS opportunities are identified within this unit as an inherent part of the assessment criteria, there are further opportunities to develop a range of PLTS through various approaches to teaching and learning.

Skill	When learners are …
Creative thinkers	explaining the marking out and calculations used for a given blacksmithing project
Reflective learners	describing the selection of ratios, units of measurement and mathematical formulas

Functional Skills – Level 2

Skill	When learners are …
ICT – Use ICT systems	
Select, interact with and use ICT systems independently for a complex task to meet a variety of needs	using appropriate methods and equipment to carry out a measuring task
Use ICT to effectively plan work and evaluate the effectiveness of the ICT system they have used	
ICT – Develop, present and communicate information	
Enter, develop and format information independently to suit its meaning and purpose including: • text and tables • images • numbers • records.	using marking-out and measuring methods to prepare an example of forged ironwork
Mathematics	
Understand routine and non-routine problems in a wide range of familiar and unfamiliar contexts and situations	calculating and measuring: • areas of squares and rounds • weights of squares and rounds • volumes of squares, rounds, cones, pyramids • angles
Identify the situation or problem and the mathematical methods needed to tackle it	describing factors that can distort measurements and accuracy of final forged outcomes
Select and apply a range of skills to find solutions	using appropriate methods and equipment to carry out a measuring task
Draw conclusions and provide mathematical justifications	describing the selection of ratios, units of measurement and mathematical formulae appropriate to a given blacksmithing project

Unit 13: Undertake Horse Handling

Unit reference number: T/601/0313
Level 3: BTEC First
Credit value: 5
Guided learning hours: 30

Aim and purpose

This unit aims to provide learners with an understanding of horse handling and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

Unit introduction

Regular handling of horses is an important part of horse care. A horse's behaviour can be improved and managed by using the correct handling techniques and equipment. Being a competent handler is invaluable when when handling and exercising horses and health and safety are extremely important for both the handler and the horse.

This unit focuses on developing and improving learner ability to handle horses. This covers both the practical and theoretical aspects of why we handle horses. The unit begins with learners investigating the methods and equipment used to handle and restrain horses in specific situations. Learners will then be able to demonstrate the skills they have developed in a number of different situations.

The unit will enable learners to adopt safe working practices and develop a confident approach to horses in preparation for employment within this sector.

Learning outcomes

On completion of this unit a learner should:

1 Be able to handle and restrain horses using specified methods

2 Know how to handle and restrain horses.

Unit content

1 Be able to handle and restrain horses using specified methods

Horse handling: horse behaviour in regard to handling techniques; health and safety issues of handling horses; physical and mental condition of the horse; capture methods

Equipment: bridle; head collar; lunge line; chifney; twitch; selection and use of personal protective equipment (PPE); correct use of handling and restraint equipment

Restraint: application of control methods and equipment; communication with assistants; health and safety

Situations: preparing for exercise; turning out; maintenance eg grooming, treatment, health checks and clipping treatments

2 Know how to handle and restrain horses

Horse handling: attitude of handler; influence of handler; correct approach; handling techniques; identification of horse's body language; horse's response to handling; physical condition and temperament of horse

Restraint: reasons for restraining horses' need for restraint; methods of restraint including holding up a leg, pinching the skin on the neck, bridle, headcoller, lunge line, chifney and twitch; advantages and disadvantages of each method; animal welfare

Recognition of stress: signs of stress; when to seek assistance; animal welfare

Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

Assessment and grading criteria		
To achieve a pass grade the evidence must show that the learner is able to:	**To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:**	**To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:**
P1 handle horses safely and correctly [TW, SM]		
P2 fit and use appropriate tack and equipment for handling and restraining horses [EP]	**M1** describe the safe use of tack and equipment when handling and restraining horses	**D1** evaluate the effectiveness of the tack equipment used when handling and restraining horses
P3 restrain horses according to instructions [EP, TW]		
P4 describe how the handler can influence horses' responses during handling through their attitude and handling techniques [IE, RL]	**M2** explain how to approach a horse taking into consideration health and safety	
P5 outline reasons for restraining horses, the methods of restraint and when to use them covering: ◊ holding up a leg ◊ pinching the skin on the neck ◊ bridle ◊ head collar ◊ lunge line ◊ chifney ◊ twitch [IE]	**M3** explain methods for restraining horses using the following: ◊ holding up a leg ◊ pinching the skin on the neck ◊ bridle ◊ head collar ◊ lunge line ◊ chifney ◊ twitch.	**D2** evaluate methods of restraint which can be used for horses.
P6 describe how to recognise if the horse is becoming stressed during restraint and when to seek assistance. [IE, RL]		

PLTS: This summary references where applicable, in the square brackets, the elements of the personal, learning and thinking skills which are embedded in the assessment of this unit. By achieving the criteria, learners will have demonstrated effective application of the referenced elements of the skills.

Key	IE – independent enquirers	RL – reflective learners	SM – self-managers
	CT – creative thinkers	TW – team workers	EP – effective participators

Essential guidance for tutors

Delivery

Delivery of this unit will involve practical assessments and written assessments, visits to suitable collections and will link to work experience placements.

Routine handling and restraint are key elements of working with horses. Competence in these areas is vital for learners to achieve the learning outcomes for this unit, as well as meeting a standard which is acceptable to the industry.

Learners will need sufficient time and guidance throughout their practical sessions in order to develop the required skills. Working on the centre's equine facility, yards or work-based placements will provide opportunities for this. Each learner should be monitored continuously and have their skills and progress assessed. Any problems or concerns that occur should be highlighted and action plans put in place to assist learners in improving their performance.

Work experience is recommended as it will provide realistic practical opportunities for learners to develop skills and learn different techniques and systems. Frequent, regular contact with horses during guided learning activities will help learners when developing confidence.

Work placements should be monitored regularly in order to ensure the quality of the learning experience. It would be beneficial if learners and supervisors were to be made aware of the requirements of this unit before any work related activities are undertaken, so that naturally occurring evidence can be collected at the time. For example, learners may have the opportunity to handle horses or carry out restraint techniques. Learners should to ask for observation records and/or witness statements to be provided as evidence. Guidance on the use of observation records and witness statements is provided on the Pearson website.

Learning outcome 1 requires learners to handle and restrain horses. Lectures and practical demonstrations will give learners the foundation knowledge and skills they need to deal with horses. Learners should have the opportunity to apply the practical skills gained during horse handling practical sessions and during work experience placements. Learners should be familiar with the correct use of PPE and the health and safety issues involved with fitting tack and other equipment. It is recommended that each learner be given the opportunity to apply handling techniques to a range of horses.

For learning outcome 2, learners must know how to handle and restrain horses. Learners will be expected to apply these skills with a range of horses and know how these skills would be applied in different situations. Formal lectures, seminars and practical demonstrations will ensure that learners have an understanding of the skills needed to handle and restrain horses safely.

Outline learning plan

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments.

The outline learning plan gives **an indication of the volume of learning it would take the average learner** to achieve the learning outcomes. It is **indicative and is one way of achieving the credit value**.

Learning time should address all learning (including assessment) relevant to the learning outcomes, regardless of where, when and how the learning has taken place.

Topic and suggested assignments/activities and/assessment
Introduction and overview of the unit.
Assignment 1: Safe Handling of Horses (P1) Tutor to introduce assignment.
Theory lesson – introductory session on handling and restraint – the reasons for it and the importance ofa safe approach, using the correct PPE and the welfare of the horse.
Practical handling – introduce learners to the different methods used to handle and restrain horses, including different pieces of equipment and situations.
Practical session – session to demonstrate how to use equipment to handle and restrain horses (use a variety of horses).
Practical session – learners to undertake a session handling horses using a variety of equipment/situations.
Learners to complete practical assessment.
Assignment 2:The Fit and Use of Handling and Restraint Equipment (P2, M2, D2) Tutor to introduce assignment1
Theory session: introduce learners to a range of tack and handling equipment and discuss its uses, and the situations it is required for.
Practical session: guidance session to demonstrate how to fit tack on a variety of horses, for a variety of situations.
Learners to complete practical assessment.
Assignment 3: Restraining Horses (P3) Tutor to introduce assignment.
Discussion: the reasons why we restrain horses and how it can be achieved.
Practical: demonstrate how to restrain horses in a variety of situations, using a number of different horses.
Practical: session for learners to practise restraining horses.
Learners to complete their practical assessment.
Assignment 4: Influencing the Horse's Response During Handling and Restraint (P4, M3) Tutor to introduce assignment.
Theory session: outline horse behaviour and body language.
Theory session: identify possible responses a horse could give to being handled.
Theory session: discussion on how to approach a horse taking into account health and safety.
Assignment 5: Reasons for Handling and Restraint (P5, M4) Tutor to introduce assignment
Theory session: outline the reasons why horses may need restraining.
Theory session: identify and discuss the methods of restraint as well as discussing the advantages and disadvantages of each.
Theory session: evaluate methods of handling and restraining horses and the equipment that can be used to do so.
Assignment 6: Recognising Signs of Stress in Horses (P6) Tutor to introduce assignment.
Theory session: define stress and list the physical and mental symptoms. Discuss how the horse's behaviour changes during periods of stress.
Theory session: discuss the health and safety implications of dealing with stressed horses.
Theory session: identify methods of reducing stress in horses and discuss each one in detail.
Unit review.

Assessment

All centres must comply with the requirements of relevant current legislation and codes of practice for example *Prevention of Accidents to Children in Agriculture Regulations 1998* and associated Approved Codes of Practice. Learners must be made aware of, and have access to, relevant health and safety legislation and know the importance of using risk assessments appropriate to each situation. Appropriate risk assessments must be undertaken before any practical horse-related activities, learners must work in a safe manner at all times when working with horses. Learners must be supervised at all times and tutors must not ask learners to undertake tasks that are beyond their physical capabilities.

As learners develop their skills they should be encouraged to assume more responsibility in practical situations and in terms of decision making. Most of the pass criteria will be practically assessed through observation of learners' ability to carry out the required tasks. If assessed directly by the tutor, suitable evidence from guided activities would be observation records completed by the learner and tutor. If assessed during a placement, witness statements should be provided by a suitable representative and verified by the tutor. Guidance on the use of observation records and witness statements is provided on the Pearson website.

For P1, learners must handle horses safely and correctly in a variety situations. This is likely to be assessed through practical observation combined with learner responses to short-answer questions, either individually or during a seminar session.

P2 requires learners to demonstrate how to fit and use the appropriate tack and other relevant equipment required to handle and restrain horses. Again practical observation by the tutor or a specialist could be undertaken together with short- answer questioning.

A similar assessment will be used for P3 where learners are required to restrain a horse, according to instructions given by the tutor. Efforts should be made to use a variety of horses so that one horse is not over-used.

P4 requires learners to describe how a handler can influence the response of the horse during handling and restraint. Learners will need to consider their own behaviour, the health, age and life stage of the horse and the procedure being carried out, as well as the environment the horse is being handled in.

For P5, learners need to outline why horses are restrained as well as the methods used. A variety of restraint techniques should be covered. Evidence could be a written project, poster or factsheet.

M1 requires learners to describe the safe use of tack and equipment when handling and restraining horses. This can be submitted in a written presentation, or assessed through oral questioning.

For M2, learners must explain how to approach horses taking into consideration health and safety. Learners should describe how to read the horse's body language as well as how they should act on their approach to the horse.

For M3, learners must explain methods available for restraining horses. Learners should refer to each one separately and their suitability for use on horses.

For D1, learners need to evaluate a range of equipment used to handle horses. This could be carried out as part of a seminar session (with appropriate records) or through the production of an assignment.

For D2, learners need to evaluate the methods of restraint which can be used for horses. Learners must provide specific details of these methods, along with the advantages and disadvantages of each.

Programme of suggested assignments

The following table shows a programme of suggested assignments that cover the pass, merit and distinction criteria in the grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Pearson assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1	Safe Handling of Horses	You are working on a livery yard and are required to handle a number of a client's horses. You must demonstrate safe, correct handling of at least three different horses.	Practical observation and written evidence.
P2, M2, D2	The Fit and Use of Handling and Restraint Equipment	For three different horses you are required to fit and use a range of handling and restraining equipment. In each case you must describe the safe use of the equipment selected and evaluate its effectiveness.	Practical observation and written evidence.
P3	Restraining Horses	You are in charge of a riding school and need to demonstrate to your staff how to restrain a horse for: • shoeing • the dentist • the bandaging a front leg wound • vaccination.	Practical observation.
P4, M3	Influencing the Horse's Response During Handling and Restraint	You are required to produce a report on how the handler can influence a horse's responses during handling and restraint. The report should include how to approach the horse safely.	Written evidence.
P5, M4	Reasons for Handling and Restraint	You need to produce a short presentation which outlines the reasons for restraining horses and the methods of restraint used. Go on to describe the reasons why we need to restrain horses and evaluate the methods available.	Written evidence.
P6	Recognising Signs of Stress in Horses	Produce a report which describes how to recognise if a horse is becoming stressed during restraint and when to seek assistance.	Written evidence.

Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

This unit forms part of the BTEC land-based sector suite. This unit has particular links with:

Level 2	Level 3
202.3 Restrain horses using specified methods	Understand Animal Anatomy and Physiology
Introduction to Keeping Horses at Grass	Prepare Horses for Presentation
Fit and Maintain Horse Tack and Clothing	Undertake and Promote Animal Health
Maintain Animal Health and Welfare	
Undertake Horse Grooming, Trimming and Plaiting	
Introduction to Caring for Competition Horses	
Introduction to the Principles of Horse Behaviour	
Introduction to Equine Stud Practice	

Essential resources

Facilities required for this unit include regular and routine access to a collection of horses for handling and exercise purposes.

Regular experience must be gained with:

- horses – a range of breeds and types except stallions
- ponies – a range of breeds and types except stallions.

Horses and ponies used for this unit should be quiet in nature and used to being handled and exercised. Extremely fit horses or ponies, or those of a difficult nature, are not suitable for use in this unit.

A sufficient number of horses should be available to give learners experience of a proper working environment. Access to horses and resources should be sufficient to give learners adequate opportunity to develop their practical ability and confidence over a period of time.

Equipment required includes handling and restraint equipment and tack and physical resources include arenas and stables.

Employer engagement and vocational contexts

Learners can carry out the practical assessments using the facilities at their centre and those at other equine facilities, as well as on work placement.

Indicative reading for learners

Textbooks

Auty I (editor) – *The BHS Complete Manual of Stable Management* (Kenilworth Press, 1998) ISBN 978-1872119038

Cave M – *The Horse Companion for BHS Stage I* (J A Allen, 2000) ISBN 978-0851317656

Cave M – *The Course Companion for BHS Stage II* (J A Allen, 2002) ISBN 978-0851317663

Houghton Brown J et al – *Horse and Stable Management* (Blackwell Publishers, 2003) ISBN 978-1405100076

Journals and magazies

Absolute Horse

Horse and Hound

Horse and Rider

Horse Magazine

Website

www.bhs.org.uk British Horse Society

Delivery of personal, learning and thinking skills (PLTS)

The following table identifies the PLTS opportunities that have been included within the assessment criteria of this unit:

Skill	When learners are …
Independent enquirers	describing how the handler can influence a horse's reponse to handling outlining reasons for restraining horses recognising signs of stress during restraint
Reflective learners	identifying when to seek assistance when handling horses describing how a handler can influence a horse's reponses to handling
Team workers	practising handling and restraint techniques
Self-managers	producing, with tutor support, reports and presentations
Effective participators	participating in practical sessions and applying the skills they have learned

Although PLTS opportunities are identified within this unit as an inherent part of the assessment criteria, there are further opportunities to develop a range of PLTS through various approaches to teaching and learning.

Skill	When learners are …
Independent enquirers	describing the equipment used to handle horses evaluating equipment used to handle horses evaluating methods of restraint
Reflective learners	evaluating equipment used to handle horses evaluating methods of restraint for horses

Functional Skills – Level 2

Skill	When learners are …
ICT – Use ICT systems	
Select, interact with and use ICT systems independently for a complex task to meet a variety of needs	using the internet to research the handling and restraint equipment used for horses using the internet to research how to use relevant handling and restraint equipment
Use ICT to effectively plan work and evaluate the effectiveness of the ICT system they have used	
Manage information storage to enable efficient retrieval	
Follow and understand the need for safety and security practices	
Troubleshoot	
ICT – Find and select information	
Select and use a variety of sources of information independently for a complex task	using the internet, textbooks and class notes to complete the unit assignments
Access, search for, select and use ICT-based information and evaluate its fitness for purpose	
ICT – Develop, present and communicate information	
Enter, develop and format information independently to suit its meaning and purpose including: • text and tables • images • numbers • records.	producing a report using a computer producing a PowerPoint presentation on the reasons why we handle and restrain horses
Bring together information to suit content and purpose	producing a report producing a presentation
Present information in ways that are fit for purpose and audience	producing a PowerPoint presentation on the reasons why we handle and restrain horses
Evaluate the selection and use of ICT tools and facilities used to present information	
Select and use ICT to communicate and exchange information safely, responsibly and effectively including storage of messages and contact lists	
Mathematics	

Skill	When learners are …
Select and apply a range of skills to find solutions	
Use appropriate checking procedures and evaluate their effectiveness at each stage	ensuring that the equipment required for handling and restraint is the correct size for the horse
Interpret and communicate solutions to practical problems in familiar and unfamiliar routine contexts and situations	
Draw conclusions and provide mathematical justifications	
English	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	responding to oral questioning during practical assessments
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	reading and summarising information on the handling and restraint of horses
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	completing a practical handling log completing a report on handling and restraint

Unit 14: Introduction to the Principles of Horse Behaviour

Unit reference number: T/601/0375
Level 2: BTEC First
Credit value: 5
Guided learning hours: 30

Aim and purpose

This unit aims to provide learners with an understanding of the principles of introduction to the principles of horse behaviour and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

Unit introduction

Horses have strength, beauty and speed which, for thousands of years, have been an integral part of human endeavour and culture. We have come to rely on horses for our own needs, be they for war, work, travel or leisure. Any person working with horses will learn quickly that a horse is a unique animal with a lifestyle and behaviour that requires careful management if it is to be successfully kept domestically.

This unit will begin by introducing learners to the evolution of the horse and the changes in its physical appearance from eohippus to the modern horse. This will lead into a study of the differences between hot and cold blooded horses, their characteristics and uses.

The unit will then enable learners to investigate horses' natural lifestyle, instincts and behaviour in the wild and compare this to the domesticated horse. Learners will be able to recognise both normal and abnormal behaviours which is a vital skill for anyone working with horses.

The unit will finish by involving learners in observing horse behaviour and allowing them to apply the knowledge they have gained in practical situations.

Learning outcomes

On completion of this unit a learner should:

1 Understand the roles of horses in society

2 Know the natural lifestyle of the horse

3 Understand the impact of domestication on the horse

4 Be able to monitor and report on horse behaviour.

Unit content

1 Understand the roles of horses in society

Evolution: major stages to include eohippus, miohippus, merychippus, pliohippus and equus; physical changes that have occurred throughout evolution; selection pressures eg climate change, environment, availability of foodstuffs, predator–prey relationships

Types and breeds*:* origins and distribution of the four types of primitive horse before domestication; links between environment and physical characteristics; development of modern day breeds

Hot and cold blooded horses*:* cold bloods eg heavy horses, natives, cobs; hot bloods eg arabs, barbs, thoroughbreds; physical characteristics; temperament; uses eg working, military, sporting, leisure

2 Know the natural lifestyle of the horse

Natural instincts: herd living; prey animal; herbivore; fight or flight response

Natural lifestyle*:* herd make up of harem and bachelor groups; lifestyle eg grazing, foraging, sleeping, grooming, loafing, rolling, playing and mating; herd hierarchy

Natural behaviours*:* communication methods; body language and outline; dominance; submission; aggression; fear; play; communication between herd members and social interaction

Handling*:* interpretation of horse body language and signals; identification of horse's state eg excited, aggressive, fearful; safety of handler

3 Understand the impact of domestication on the horse

Differences in lifestyle: access to food and water; choice of diet; changes in feeding behaviour; social interaction; exercise; health; time budgets (length of time spent on different activities within a 24-hour period)

Traditional management*:* adaptations to domestic life*;* stabling; restricted access to grazing; limited opportunities for social interaction; controlled exercise; changes in diet and feeding patterns; effects on behaviour

Abnormal stereotypical behaviours*:* weaving; crib-biting; wind sucking; box walking; causes; signs; prevention; management by focusing on natural lifestyle and instincts; 'treatments' versus humane management

4 Be able to monitor and report on horse behaviour

Observation of behaviour: stabled horses eg loose boxes, American barn; grazing horses eg fields, paddocks, alone or with company; effects of routine and management; before and after periods of exercise or turn out; during feeding; with or without companions present; response to environment and stimuli

Record observations*:* identification and recording of normal and abnormal behaviours; significance of observations; reporting findings; action to be taken

Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

Assessment and grading criteria		
To achieve a pass grade the evidence must show that the learner is able to:	**To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:**	**To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:**
P1 explain the major stages in the evolution of the modern horse [CT]	**M1** describe the factors which influenced the evolution of the modern horse	
P2 explain how evolution has created different types and breeds of horses [CT]		
P3 describe cold and hot blooded types, linking behavioural characteristics to their uses		
P4 outline the natural instincts of the horse		
P5 describe the natural lifestyle of the horse		
P6 describe different type of natural behaviours in the horse including: ◊ Dominant ◊ Submissive ◊ Aggressive ◊ Frightened ◊ Playful	**M2** explain how the horse uses body language to communicate with others in the herd	**D1** explain how a knowledge of natural behaviours can assist the handler when working with horses
P7 explain the differences between the lifestyles of wild and domesticated horses	**M3** compare time budgets for wild and domesticated horses	
P8 explain the changes in horse lifestyle and behaviour that are created by traditional management		
P9 discuss common behavioural problems and how these can be solved by focusing on the horses natural instincts	**M4** contrast 'treatment' with management strategies used to prevent abnormal behaviours	

Assessment and grading criteria		
To achieve a pass grade the evidence must show that the learner is able to:	**To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:**	**To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:**
P10 observe the behaviour of horses in a stable [IE]		
P11 observe the behaviour of horses in the field [IE]		
P12 record observations and report findings. [IE]	**M5** analyse the behaviour of observed stabled and grazing horses.	**D2** plan and justify improvements in the management routine for a specified horse.

PLTS: This summary references where applicable, in the square brackets, the elements of the personal, learning and thinking skills which are embedded in the assessment of this unit. By achieving the criteria, learners will have demonstrated effective application of the referenced elements of the skills.

Key			
	IE – independent enquirers	RL – reflective learners	SM – self-managers
	CT – creative thinkers	TW – team workers	EP – effective participators

Essential guidance for tutors

Delivery

Delivery of this unit will involve practical and written assessments and visits to suitable collections, and will link to work experience placements.

In order to follow this unit, learners should have some experience of handling and working with horses. The unit should be taught using a mixture of underpinning theory and practical sessions. The observation and interpretation of equine behaviour should be an integral part of all practical sessions. Learners should have the opportunity to observe horses in a variety of situations, for example, when stabled, at grass, when handled or ridden, and at events if possible.

Learning outcome 1 covers the evolution of the horse and the development of types and breeds. This is likely to involve formal delivery including lectures, presentations and discussions. Learners will need to understand the differences between cold and hot blooded horses and their different uses, which could be delivered through observations made during field trips and visits.

In learning outcome 2 learners are required to investigate the natural lifestyle and instincts of the horse. This is likely to involve some formal delivery but would be greatly enhanced by the use of high quality visual/audio-visual materials of wild or feral horse populations. Learners could also develop their knowledge and understanding through field trips where they have the opportunity to observe groups of horses in a herd situation. Recognition of natural behaviours should give learners a greater awareness and understanding of the horses in their care.

Learning outcome 3 requires learners to investigate the differences between the lifestyles of wild and domesticated horses, with emphasis on the changes in lifestyle caused by traditional management practices. This will require some formal delivery but it should also be linked to practical application. The use of high quality visual/audio-visual materials could provide examples of different abnormal behaviours. Visiting expert speakers could add relevance to the subject for learners.

Learning outcome 4 involves learners in observing horse behaviour and reporting their findings. Learners will develop observational skills and ideas as to how behaviour can be monitored, recorded and analysed. Observation of horses in a variety of yards or field situations could provide evidence.

Outline learning plan

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments.

The outline learning plan gives **an indication of the volume of learning it would take the average learner** to achieve the learning outcomes. It is **indicative and is one way of achieving the credit value**.

Learning time should address all learning (including assessment) relevant to the learning outcomes, regardless of where, when and how the learning has taken place.

Topic and suggested assignments/activities and/assessment
Introduction and overview of the unit.
Assignment 1: Development of the Modern Horse (P1, P2, P3, M1) Tutor introduces the assignment.

Topic and suggested assignments/activities and/assessment
Theory sessions: the major stages in the evolution of the horse and the physical changes that have taken place; selection pressures; development of four types of primitive horse.
Practical application: observing hot- and cold-blooded horses and identifying their characteristics and uses.
Assignment 2: The Horse in the Wild (P4, P5, P6, M2, D1) Tutor introduces the assignment.
Theory sessions: horsenatural instincts and lifestyle; communication and body language.
Practical application: observing horses to identify different types of body language and behaviour.
Discuss how recognising body language can assist when handling the horse.
Independent study: preparation and delivery of the horse in the wild presentations.
Assignment 3: The Impact of Domestication (P7, P8, P9, M3, M4) Tutor introduces the assignment.
Theory sessions: natural instincts and lifestyle; the impact of domestication and traditional management on the horse; abnormal behaviours.
Practical session: observation of horses to assess the impact of traditional management on behaviour.
Discuss treatment of stereotypic behaviours and contrast this with management strategies that focus on the horse's natural instincts and lifestyle.
Independent study: construct time budgets for wild and domesticated horses.
Assignment 4: Observe the Behaviour of Horses (P10, P11, P12, M5, D2) Tutor introduces the assignment.
Theory session: observing and recording horse behaviours and analysing the results.
Practical sessions: observation of horses in a variety of situations.
Independent study: design a checklist to be used in the observation of horse behaviour.
Practical session: observe stabled and grass kept horses and record findings.
Independent study: analyse results of observations of stabled and grass kept-horses; make recommendations for improvement in the management of a specified horse.
Unit review.

Assessment

For P1, learners need to explain the major stages in the evolution of the horse and the physical changes that have taken place. Learner work should demonstrate a basic understanding of the main stages that led from eohippus to the modern horse. The use of relevant images to support text may help learners in explaining the individual stages.

For P2 and P3, learners are required to provide information on evolution and different types and breeds of horses. Evidence should focus on the development of the four types of primitive horse before domestication.

For P4 and P5, learners must outline the natural instincts and describe the natural lifestyle of the horse. Leaner work should include herd structure in the wild and a description of the range of activities that make up the daily routine of a wild horse. If evidence is the preparation and delivery of a presentation, learners should be encouraged to use ICT and incorporate relevant images to support the text.

For P6, learners must describe the different types of natural behaviours in the horse. This includes body language and outline and the interpretation of different states to include fear, dominance, submission, aggression and play. Learners should be encouraged to use visual/audio-visual materials to aid their descriptions.

For P7 and P8, learners must explain the difference in the lifestyles of wild and domesticated horses and changes in lifestyle and behaviour caused by traditional management practices. Learners should identify traditional management practices and explain clearly how they impact on the horse's natural lifestyle and behaviour.

For P9, learners will discuss common behavioural problems found in horses, and their causes and signs. They should then go on to discuss how they can be resolved by focusing on the horse's natural instincts. Learners should discuss a minimum of four behavioural problems.

For P10, P11 and P12, learners must produce observation checklists that can be used to monitor the behaviour of both stabled and grazing horses. The checklists should then be completed for two stabled and two grazing horses. It is suggested each horse is observed on a number of occasions, and, in total, each horse should have been observed for an hour. Grazing horses may either be observed together or separately. The checklists should identify and record the behaviours observed correctly. Reporting on the findings should include whether the observed behaviours are normal or abnormal.

For M1, learners will describe selection pressures on the horse throughout evolution such as climate, availability of food, predator–prey relationships.

For M2, learners must explain how the horse uses body language to communicate with other members of the herd. For example, an excited horse with high tail, tense body and prancing movement can make all the other horses excited. This is likely to be supported by learners' practical observation of horses in a variety of situations. Learners should be encouraged to use visual/audio-visual materials to demonstrate their understanding of the topic.

For M3, learners are required to compare time budgets for wild and stabled horses in a 24-hour period. The results could be presented graphically, for example as a pie chart, for ease of interpretation.

For M4, learners are required to contrast the traditional treatment of stereotypical behaviours with more humane methods that focus on the horse's natural instincts. Learners should provide evidence for a minimum of four different abnormal behaviours and their treatments.

For M5 and D2, learners must analyse the information gathered for P10 and P11. Learner analysis of their findings should include whether observed behaviours are normal or abnormal and links should be drawn between this and the horse's management, welfare and mental wellbeing. Learners must then plan and justify improvements to the management routine of a specified horse – this is likely to be one of the horses observed for P10 or P11.

For D1, learners must explain how an understanding of horses' body language can assist them when handling horses. For example, learners should be able to recognise aggressive behaviour and explain the impact it has on the health and safety of the handler.

Programme of suggested assignments

The following table shows a programme of suggested assignments that cover the pass, merit and distinction criteria in the grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Pearson assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1, P2, P3, M1	Development of the Modern Horse	Produce a series of factsheets to explain the evolution of the horse and the development of breeds and types.	Written evidence in the form of three A4-sized factsheets

Criteria covered	Assignment title	Scenario	Assessment method
P4, P5, P6, M2, D1	The Horse in the Wild	Produce a presentation which outlines the natural instincts of the horse and describes their natural lifestyle and behaviours, including communication between herd members, and how an awareness of horse behaviours can assist when handling horses.	Presentation
P7, P8, P9, M3, M4	The Impact of Domestication	Produce a report explaining the difference in the lifestyles and time budgets of wild and domesticated horses and changes in lifestyle and behaviour caused by traditional management practices. Include a discussion on common abnormal behavioural problems, contrasting 'treatment' with management strategies used to prevent abnormal behaviours.	Written report
P10, P11, P12, M5, D2	Observe the Behaviour of Horses	Produce observation checklists and use them to monitor the behaviour of two stabled and two grazing horses. Record your observations. Analyse your findings and plan and justify improvements to a specified horse's management routine.	Completed observation checklist for four horses Written report.

Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

This unit forms part of the BTEC land-based sector suite. This unit has particular links with:

Level 2	Level 3
Maintain Animal Health and Welfare	Understand Animal Anatomy and Physiology
Understand the Principles of Horse Biology	Understand the Principles of Horse Behaviour and Welfare

Essential resources

Access to horses in a variety of situations, for observation purposes, is essential. Visits to shows, studs, stables and welfare centres will provide excellent opportunities for learning.

Employer engagement and vocational contexts

This unit focuses on the evolution, natural instincts and behaviour of the horse and the effects of domestication. Centres are encouraged to develop links with local yards to allow learners to observe horses in a variety of situations.

Indicative reading for learners

Textbooks

Budiansky S – *The Nature of Horses: Their Evolution, Intelligence and Behaviour* (Phoenix, 1998) ISBN 978-0753801123

Fraser A F – *The Behaviour of the Horse* (CABI Publishing, 1992) ISBN 978-0851987859

Mills D and Nankervis K – *Equine Behaviour: Principles and Practice* (Wiley-Blackwell, 1998) ISBN 978-0632048786

Magazines

Horse and Hound

Horse and Rider

Your Horse

Website

www.horsedata.co.uk	Information on stereotypic behaviours

Delivery of personal, learning and thinking skills (PLTS)

The following table identifies the PLTS opportunities that have been included within the assessment criteria of this unit:

Skill	When learners are …
Independent enquirers	planning and carrying out observations of horse behaviour, analysing results of observations and reporting findings
Creative thinkers	considering the effects of domestication on the horse.

Although PLTS opportunities are identified within this unit as an inherent part of the assessment criteria, there are further opportunities to develop a range of PLTS through various approaches to teaching and learning.

Skill	When learners are …
Independent enquirers	researching the evolution of the horse and the development of breeds and types
Creative thinkers	considering the management and welfare of the horses in their care
Reflective learners	using knowledge of horse behaviour to improve their awareness and handling technique
Team workers	collaborating with others to produce a presentation.

Functional Skills – Level 2

Skill	When learners are …
ICT – Find and select information	
Select and use a variety of sources of information independently for a complex task	using the internet to research information on evolution, breeds and types using the internet to research for information on abnormal behaviours in horses
Access, search for, select and use ICT-based information and evaluate its fitness for purpose	evaluating the relevance of information found on evolution
ICT – Develop, present and communicate information	
Enter, develop and format information independently to suit its meaning and purpose including: • text and tables • images • numbers • records.	producing written assessments using ICT programmes producing a checklist used to observe behaviour in horses producing a presentation which includes the use of relevant images
Bring together information to suit content and purpose	
Present information in ways that are fit for purpose and audience	delivering a presentation using PowerPoint
Evaluate the selection and use of ICT tools and facilities used to present information	
Mathematics	
Understand routine and non-routine problems in a wide range of familiar and unfamiliar contexts and situations	
Identify the situation or problem and the mathematical methods needed to tackle it	
Select and apply a range of skills to find solutions	producing a summary for the number of occurrences of observed behaviours calculating time budgets for wild and domesticated horses
Use appropriate checking procedures and evaluate their effectiveness at each stage	
Interpret and communicate solutions to practical problems in familiar and unfamiliar routine contexts and situations	producing results from observations in table or graph format
Draw conclusions and provide mathematical justifications	
English	

Skill	When learners are …
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	presenting information on the horse in the wild
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	reading and summarising a variety of information on evolution, breeds and types and the natural lifestyle and instincts of the horse
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	producing a series of A4 fact sheets on evolution and breeds and types of horses completing a written assignment on the impact of domestication completing a presentation on the horse in the wild completing an observation checklist and reporting findings.

Unit 15: Understand the Principles of Horse Biology

Unit reference number: M/601/0309
Level 2: BTEC First
Credit value: 10
Guided learning hours: 60

Aim and purpose

This unit aims to provide learners with an understanding of the principles of horse biology. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

Unit introduction

Equestrian sport depend on the welfare of the horse for their success – but not all human participants in equestrian sports understand the demands which they put on their horses. To achieve success and to avoid unnecessary suffering to the horse, trainers and riders need to understand how to achieve the correct level of equine fitness; this knowledge is gained through the study of basic biological and scientific facts and studying how horses function in the modern world. This unit focuses on providing learners with the knowledge and understanding of how a horse works. The learner is introduced to basic structure of the horse as an animal, to gain knowledge, and to appreciate the function of the skeleton, muscles and systems in animals. The systems covered include the cardiovascular, respiratory, digestive and excretory systems.

Learning outcomes

On completion of this unit a learner should:

1 Know the structure and function of the systems associated with support and movement

2 Know the structure and function of the cardiovascular system in the horse

3 Know the structure and function of the respiratory system in the horse

4 Know the structure and function of the digestive system in the horse.

Unit content

1 Know the structure and function of the systems associated with support and movement

Skeleton of the horse: the component parts including axial and appendicular skeletons; function and attachment of skeletal muscle (voluntary or striated) to include: support, protection, leverage

Functions and structure of joint: ball and socket; fixed or fibrous; cartilaginous (slightly movable); synovial (freely movable)

Major muscles: eg Rhomboideus, Splenius, Trapezius, Latissimus Dorsi, Triceps, Biceps, Longissimus Dorsi, Gluteal, Biceps femoris

2 Know the structure and function of the cardiovascular system in the horse

The functions of the horse's heart: structure of the heart; the heart as a transport system; defence against disease; the cardiac or pumping cycle; the role of the blood vessels (including arteries, veins and capillaries); components of blood and their function; the differences between arterial and venous blood; assistance in techniques to monitor and record a horse's heart rate (at rest, after exercise); influence of movement on cardiovascular system

3 Know the structure and function of the respiratory system in the horse

Structure and function of the respiratory system: structure of the nostrils and nasal passage, pharynx and larynx, trachea, lungs (bronchi, bronchioles and alveoli); the mechanics of breathing and the process of gaseous exchange; the factors which control the respiratory rate; the normal range in healthy horses and reasons for variation, the importance of maintaining a healthy respiratory system; implications of not maintaining

4 Know the structure and function of the digestive system in the horse

The structure and function of the digestive system: mouth and teeth; pharynx; oesophagus; stomach; small intestine; caecum; large intestine; pancreas; gall bladder and liver; digestion (chewing and muscular action, chemical digestion, role of saliva, gastric juices, intestinal juices, pancreatic, juices and bile, fermentation by micro-organisms and absorption)

The structure and function of the excretory system: fermentation by micro-organisms; absorption; the structure of the kidneys, bladder and excretory system; the function of the kidneys (filtration, absorption, urine production and the storage and release of urine by the bladder)

Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

Assessment and grading criteria					
To achieve a pass grade the evidence must show that the learner is able to:		**To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:**		**To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:**	
P1	identify the major bones of the horse skeleton	**M1**	describe the three types of muscles found: skeletal, smooth and cardiac	**D1**	explain the influence movement has on the cardiovascular system
P2	identify the major muscles of the horse associated with support and movement [IE, RL]				
P3	identify the structure and function of the lower leg: ◊ tendons ◊ ligaments ◊ hoof				
P4	state the functions of the cardiovascular system	**M2**	demonstrate the ability to assist with the monitoring and recording of a horse's heart rate: a) at rest, b) after exercise		
P5	describe the structure and roles of the major components of the cardiovascular system				
P6	describe the components of blood and their function				
P7	describe the structure of the respiratory system in the horse			**D2**	explain one method of getting a horse fit that includes the regular monitoring of a horse's heart rate.
P8	identify the horse's normal respiratory rate				
P9	describe the processes of: ◊ breathing ◊ gaseous exchange				
P10	describe the structure of the digestive system in the horse, to include basic dentition	**M3**	explain how proteins, starch and fat are broken down by enzymes within a horse's digestive system		
P11	describe the functions of the digestive system				

PLTS: This summary references where applicable, in the square brackets, the elements of the personal, learning and thinking skills which are embedded in the assessment of this unit. By achieving the criteria, learners will have demonstrated effective application of the referenced elements of the skills.

Key	IE – independent enquirers	RL – reflective learners	SM – self-managers
	CT – creative thinkers	TW – team workers	EP – effective participators

Essential guidance for tutors

Delivery

Delivery of this unit will involve practical assessments, written assessment, visits to suitable equestrian events and will link to industrial experience by placements in suitable yards. The learner should be included in discussions on the various ways of getting horses fit and should have the opportunity, if possible, to see race horses on gallops and be able to observe endurance horses, polo ponies and/or event horses using a number of methods including interval training. Visits to racing/polo/eventing and show jumping yards would be beneficial to the learner.

Outline learning plan

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments.

The outline learning plan gives **an indication of the volume of learning it would take the average learner** to achieve the learning outcomes. It is **indicative and is one way of achieving the credit value**.

Learning time should address all learning (including assessment) relevant to the learning outcomes, regardless of where, when and how the learning has taken place.

Topic and suggested assignments/activities and/assessment
Introduction to unit and overview of assignments by tutor.
Assignment 1: Horse Structure and Movement (P1, P2, P3, M1, D1) The component parts including axial and appendicular skeletons/function and attachment of skeletal muscle (voluntary or striated) to include: support/protection/leverage. Functions and structure of joint to include: ball and socket/fixed or fibrous/cartilaginous (or slightly movable) and synovial (or freely movable).
Tutor-led lectures on anatomy followed by gap-fills and written assignments to assess learning; assignments include posters showing the main muscles in a horse, the lower leg showing bones, tendons and ligaments.
Assignment 2: Know the Structure and Function of the Cardiovascular System of a Horse (P4, P5, P6, M2) The structure of the heart/the heart as a transport system/defence against disease/the cardiac or pumping cycle; the role of the blood vessels (including arteries, veins and capillaries), components of blood and their function and the differences between arterial and venous blood. Monitoring a horse's heart rate at rest and after exercise, methods, and practical application.
Tutor-led lectures on anatomy followed by gap-fills and written assignments to assess learning; assignments include posters showing the structure of the heart and blood.
Practical activity monitoring horses' heart rate at rest and during exercise.
Assignments 3: Know the Structure and Function of the Respiratory System of a Horse (P7, P8, P9, D2) The factors which control the respiratory rate/the normal range in healthy horses and reasons for variation. The importance of maintaining a healthy respiratory system and the implications if this is not maintained. The structure of the respiratory system including nostrils and nasal passage/pharynx and larynx/trachea/lungs (bronchi, bronchioles and alveoli)/the mechanics of breathing and the process of gaseous exchange. Discuss various methods of getting horses fit (advantages and disadvantages), to include 'interval training'.

Topic and suggested assignments/activities and/assessment
Assignment 4: Know the Structure and Function of the Digestive Dystem (P10, P11, M3) The mouth and teeth, pharynx, oesophagus, stomach, small intestine, caecum, large intestine, pancreas, gall bladder and liver. The functions of the digestive system to include: mechanical digestion – chewing and muscular action/chemical digestion – role of saliva, gastric juices, intestinal juices, pancreatic juices and bile, fermentation by micro-organisms and absorption. The structure and function of the excretory system: fermentation by micro-organisms, absorption, the structure of the kidneys, bladder and excretory system. The function of the kidneys to include: filtration, absorption, urine production and the storage and release of urine by the bladder. Tutor-led lectures on anatomy followed by gap-fills and written assignments to assess learning; assignments include posters showing the structure of the digestive system and the excretory system.
Unit review.

Assessment

Learners must meet all pass criteria listed in the grading grid. For P1, learners are expected to identify the appendicular and the axial skeleton of the horse; gap-fills could be used to check knowledge. P2 requires learners to show their knowledge of the muscles used for support and movement, following with the identification of tendons, ligaments and finally the hoof to fulfil the criteria for P3. P4 requires learners to state the functions of the horse's cardiovascular system. P5 could be linked with P4 as learners need to describe the structure and roles of the major components of the cardiovascular system. P6 requires learners to describe the function and components of blood. P7 requires learners to describe the respiratory system. P8 and P9 require learners to describe the normal function of the process of breathing and gaseous exchange within that process. P10 and P11 require learners to describe the structure and function of the digestive system; knowledge could be shown in a written assignment, or poster.

Learner to achieve all the pass criteria plus the following.

M1 requires learners to describe the three types of muscles found in the horse ie skeletal, smooth and cardiac. M2 follows on from P4 as it requires learners to actually monitor a horse's heart rate at both rest and after exercise. M3 requires a written assignment describing the function of enzymes within the horse's digestive system.

Learner to achieve all the pass and merit criteria plus the following.

For D1, learners need to explain the influence of movement on the cardiovascular system. This could be assessed through a presentation or assignment. D2 requires learners to provide information on horse fitness and could be as part of a presentation or report.

Programme of suggested assignments

The following table shows a programme of suggested assignments that cover the pass, merit and distinction criteria in the grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Pearson assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1, P2, P3, M1, D1	Horse Structure and Movement	Complete a gap-fill of the appendicular and axial skeleton of the horse. Design two posters showing the main muscles of the horse: a) superficial and b) deep musculature. Produce a poster of the horse's lower leg to include tendons, ligaments and the hoof and show their muscle attachment. Describe how muscles are used to move the horse, and describe the types of muscle found.	Poster (coloured). Poster or gap-fill. Poster (coloured). Written assignment.
P4, P5, P6, M2	Know the Function of the Cardiovascular System of a Horse	Describe the function of the cardiovascular system and include the major components within it to complete both P4 and P5. Describe the components of blood and give an explanation of the main functions: nutrition, waste disposal, defence, wound healing and regulation of body temperature. Demonstrate the actual recording and monitoring of a horse a) at rest and b) after exercise.	Written assignment. Poster. Written assignment. Observation/photos. Video/witness statements.
P7, P8, P9, D2	Know the Structure and Function of the Horse's Respiratory System	Produce a poster diagram showing the respiratory system and describe how it functions. Discuss the normal respiratory rate of horses. Describe how gaseous exchange happens within respiration. Evaluate heart rate monitors used to assess a horse's fitness.	Written. Either written or can be included in the presentation in M3. Written/oral. Presentation of 20 minutes. DVD or video.
P10, P11, M3	Know the Structure and Function of the Digestive System	Design a poster showing the digestive system of the horse starting from the mouth. Describe the functions of the digestive system (could be combined with P10). Describe how proteins, starch and fats are broken down by enzymes within the horse's digestive system.	Poster. Poster and/or written assignment. Written assignment.

Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

This unit forms part of the BTEC land-based sector suite. This unit has particular links with:

Level 2	Level 3
Maintain Animal Health and Welfare	Understand Animal Anatomy and Physiology
	Understand the Principles of Animal Biology

Essential resources

Learners will need supervised access to practical demonstrations or training sessions of horses being made fit for a number of different activities to gain evidence and relate the theory to a practical context.

A range of library material and internet access will be necessary to enable the learners to achieve this unit. Videos or DVDs may also be required to give learners the breadth of experience and observation required.

Employer engagement and vocational contexts

Tutors delivering this unit should be competent and experienced at getting horses fit. Ideally, they should have recent industrial experience within the commercial equestrian training industry and show evidence of regular technical updating. Centres are encouraged to create opportunities for the learners to have practical experience whenever possible to help them link with their theory sessions, for example they need to have the opportunity to monitor a horse's respiration and heart rate regularly at rest and after exercise. There should be discussions, whenever possible, regarding methods of getting horses fit.

Indicative reading for learners

Textbooks

Davies Z – *Introduction to Horse Biology* (Wiley-Blackwell, 2005) ISBN 978-1405121620

Horace Hayes M – *Veterinary Notes for the Horse Owner* (BiblioBazaar, LLC, 2010) ISBN 978-1143997235

Snow D H and Vogel C J – *Equine Fitness – The Care and Training of the Athletic Horse* (David & Charles PLC, 1987) ISBN 978-0715387337

Websites

www.badminton-horse.co.uk	Burghley Horse Trials
www.bhs.org.uk	British Horse Society
www.britishdressage.co.uk	British Dressage
www.britisheventing.co.uk	British Eventing
www.bsja.co.uk	British Show Jumping Association
www.hickstead.co.uk	Hickstead
www.horseandhound.co.uk	Horse and Hound

Delivery of personal, learning and thinking skills (PLTS)

The following table identifies the PLTS opportunities that have been included within the assessment criteria of this unit:

Skill	When learners are …
Independent enquirers	researching own investigative work towards assignments and comparisons within horse biology
Reflective learners	giving constructive feedback to their peers and being receptive to feedback given by others on their own work and ideas

Although PLTS opportunities are identified within this unit as an inherent part of the assessment criteria, there are further opportunities to develop a range of PLTS through various approaches to teaching and learning.

Skill	When learners are …
Independent enquirers	investigating the latest research and suggestions by experts regarding the treatment of problems within the system of the horse or whilst getting a horse fit
Creative thinkers	giving examples of fittening methods used for a variety of different equine sports
Reflective learners	able to digest feedback from others and reflect on their actions during set tasks, learn from their own actions, and make amendments and improvements to their own performance
Team workers	able to work with others in a cooperative manner, 'pull their weight' and take care of their own safety and welfare and that of others around them
Self-managers	able to plan their own work with minimum supervision, reflect on their results and help plan their own learning and future work to enhance their own performance
Effective participators	able to join in discussions, practical assignments and tasks, planning their own work and giving and receiving constructive feedback

Functional Skills – Level 2

Skill	When learners are …
ICT – Use ICT systems	
Select, interact with and use ICT systems independently for a complex task to meet a variety of needs	able to show a basic working knowledge of computers, printers, laminators, data storage and inter-connectivity where appropriate
Use ICT to effectively plan work and evaluate the effectiveness of the ICT system they have used	able to select the most useful templates available on websites to produce feeding programmes for mares and foals and/or health checks
Manage information storage to enable efficient retrieval	able to understand the need and method of backing up, storing and titling and use the various types of storage medium available eg CDs, DVDs, hard disc, memory sticks etc
Follow and understand the need for safety and security practices	able to understand the need for anti-virus software and how to use it and the problems when file sharing
Troubleshoot	able to understand the use of 'help' menus and the various methods of data retrieval.
ICT – Find and select information	
Select and use a variety of sources of information independently for a complex task	able to research information ie websites and textbooks to compare findings on the variety of breeding programmes
Access, search for, select and use ICT-based information and evaluate its fitness for purpose	able to proficiently use IT systems to search for information and evaluate the usefulness of searches; have a working knowledge of search procedures
ICT – Develop, present and communicate information	
Enter, develop and format information independently to suit its meaning and purpose including: • text and tables • images • numbers • records.	able to research information ie websites and textbooks to compare findings on the variety of breeding programmes
Bring together information to suit content and purpose	able to proficiently use IT systems to search for information and evaluate the usefulness of searches; have a working knowledge of search procedures
Present information in ways that are fit for purpose and audience	able to produce assignments, schemes of work, lesson plans etc to a high standard to suit purpose eg handouts for presentations
Evaluate the selection and use of ICT tools and facilities used to present information	able to have the confidence and ability of choice when deciding what ICT tools to use for each task
Select and use ICT to communicate and exchange information safely, responsibly and effectively including storage of messages and contact lists	able to guard their own passwords and not indiscriminately send on information to others using discretion when sending messages and information and not allowing people to view their work with a view to copying

Skill	When learners are …
Mathematics	
Understand routine and non-routine problems in a wide range of familiar and unfamiliar contexts and situations	aware of mathematics as a tool to be used in a wide range of situations as a reference, to solve problems using number for solution, for example with and without calculators
Identify the situation or problem and the mathematical methods needed to tackle it	able to recognise relevant formulae and expressions, in a situation where mathematics is applicable to the solution, and the method required to solve the problem
Select and apply a range of skills to find solutions	able to use suitable visual mathematical statistical representation when applicable, and be able to interpret a range of information available
Use appropriate checking procedures and evaluate their effectiveness at each stage	aware of the standard procedures for checking results and able to compare findings at each stage aware of the importance of keeping accurate records of findings at each stage of a procedure
Interpret and communicate solutions to practical problems in familiar and unfamiliar routine contexts and situations	able to use suitable visual mathematical statistical representation when applicable, and interpret a range of information available.
Draw conclusions and provide mathematical justifications	able to show findings accurately and all workings
English	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	able to take part in a variety of discussions with fellow learners and use a variety of methods to make their own presentations able to listen to others speaking, including people giving presentations on a variety of subjects
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	able to interpret information from a variety of sources to present their work and involve themselves in discussions with information received
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	able to write up assignments and reports and use their information when giving presentations in PowerPoint or in supporting handouts, using 'pen and paper' method as well as ICT

Unit 16: Introduction to Land-based Workshop Practice

Unit reference number: F/600/9794
Level 2: BTEC First
Credit value: 10
Guided learning hours: 60

Aim and purpose

The learner will cover the basic work requirements within land-based workshops. They will understand the importance of Health and Safety as an integral topic. They will learn how to safely use hand and power tools and basic welding equipment commonly found in a land-based setting. The skills associated with these will be integrated with the development and use of basic maintenance and repair techniques.

Unit introduction

The practical application of workshop skills plays a vital part in land-based business operations. Predominantly concerned with 'things mechanical' these skills, deployed in a safe and efficient manner, contribute greatly to the wellbeing of successful organisations and individuals. Workshop activities not only include both repair and servicing work, but also fabrication and re-fabrication of new and worn out or damaged components. The ability to return a broken machine to optimum working condition and so reduce down time and costs, is a skill much sought after by employers in land-based industries.

The scale and complexity of jobs undertaken in land-based workshops will depend on their size, level of equipment, the employees skills, tools available and the type of work the organisation is involved in. However there are basic principles that underpin any workshop activity. Foremost is the health, safety and wellbeing of employees, employers, visitors and customers of the organisation.

From basic principles the unit aims to develop good working practices in the use of hand and power tools and stresses the need for good maintenance and storage of these expensive assets. The most common forms of welding and cutting will be introduced allowing learners to apply the skills and knowledge gained in maintenance, servicing, repair and fabrication activities on land-based machines and equipment.

Learners will be directed to a range of information sources including operator and workshop manuals, standards organisations, maintenance and adjustment schedules, and will understand the importance of working to specifications where stated. Generally, workshop tidiness and the need to maintain a clean and uncluttered working environment will be embedded as supervised practical work is undertaken in either simulated or commercial workshop conditions.

Learning outcomes

On completion of this unit a learner should:

1 Be able to safely use commonly found hand and power tools for the maintenance and repair of land-based machinery and installations

2 Be able to safely use basic welding and cutting equipment

3 Be able to safely use basic maintenance and/or repair techniques on land-based machinery and installations

4 Understand land-based workshop health and safety requirements.

Unit content

1 Be able to safely use commonly found hand and power tools for the maintenance and repair of land-based machinery and installations

Safe use of hand and power tools: hand tools eg spanners, socket sets, screwdrivers, Allen keys, pliers, hammers; hand tools for measuring, marking out and cutting eg rules, squares, centre punches, hacksaws; power tools for drilling, grinding, cutting and soldering eg 240V, 110V and cordless tools as appropriate; correct uses of each type of tool listed; safe methods of use; tool storage and maintenance; tool transportation; health and safety

2 Be able to safely use basic welding and cutting equipment

Safe use of basic welding and cutting equipment: manual metal arc (MMA); metal inert gas (MIG); brazing; oxy-acetylene welding and cutting; advantages and limitations of each system; set up, use and maintenance of equipment and materials; methods used to produce basic fillet and butt joints; use of welding standards; health and safety; risk assessment

3 Be able to safely use basic maintenance and/or repair techniques on land-based machinery and installations

Techniques: construction and use of fasteners eg nuts, bolts, rivets, circlips; driveline maintenance eg belts, chains; cutting mechanism maintenance eg sharpening, adjusting; lubrication requirements eg grease, oil, 'anti rust' agents; service and maintenance schedules; manufacturers' handbooks; health and safety

4 Understand land-based workshop health and safety requirements

Health and safety procedures: personal protective equipment (PPE); relevant current legislation and codes of practice eg Health and Safety at Work Act 1974; role of welding standards; risk assessment; employee responsibilities; employer responsibilities; personnel cleaning requirements and facilities

Assessment and grading criteria

In order to pass this unit, the evidence that the learner presents for assessment needs to demonstrate that they can meet all the learning outcomes for the unit. The assessment criteria for a pass grade describe the level of achievement required to pass this unit.

Assessment and grading criteria					
To achieve a pass grade the evidence must show that the learner is able to:		**To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:**		**To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:**	
P1	select and safely use hand and power tools to meet given objectives maintaining or repairing land-based machinery or installations [IE, TW, EP]	**M1**	plan the work processes and tool requirements to carry out routine maintenance tasks on land-based machinery	**D1**	report on the activities undertaken and equipment and materials used to complete workshop maintenance and repair tasks on land-based machinery
P2	state reasons for the hand and power tools selected [RL]				
P3	safely use basic welding equipment and materials to produce a simple welded joint to meet given objectives [IE, TW]	**M2**	review a given simple welded fabrication task suggesting improvements		
P4	state reasons for the basic welding equipment and materials selected				
P5	safely use basic techniques to maintain or repair land-based machinery or installations to meet given objectives	**M3**	illustrate safe working procedures for an identified area of work in a land-based workshop environment.	**D2**	explain employee responsibilities under health and safety legislation when operating in a land based workshop environment.
P6	state reasons for the basic techniques selected				
P7	explain the importance of health and safety in the workshop [RL, CT, SM]				
P8	produce a suitable risk assessment for the use of hand and/or power tools to meet given objectives. [RL, CT, SM]				

PLTS: This summary references where applicable in the pass criteria, in the square brackets, the elements of the personal, learning and thinking skills. It identifies opportunities for learners to demonstrate effective application of the referenced elements of the skills.

Key	IE – independent enquirers	RL – reflective learners	SM – self-managers
	CT – creative thinkers	TW – team workers	EP – effective participators

Essential guidance for tutors

Delivery

All centres must comply with the requirements of relevant current legislation and associated codes of practice, for example the *Prevention of Accidents to Children in Agriculture Regulations 1998*. Learners must be made aware of, and have access to, relevant health and safety legislation and know the importance of the use of risk assessment appropriate to each situation. Appropriate risk assessment must precede all practical machinery activities, learners must work in a safe manner at all times when using equipment or working with machinery. Learners must be supervised at all times and tutors must not request learners undertake tasks that are beyond their physical capabilities.

Delivery is likely to be a mixture of classroom learning and supervised practical sessions in a workshop. Assessment is likely to be in the form of a portfolio of evidence bringing together recorded and authenticated evidence.

Tutors have the opportunity to use as wide a range of techniques as possible. Lectures, discussions, seminar presentations, site visits, supervised land-based workshop practicals, internet and library research and the use of personal and/or industrial experience would all be suitable. Delivery should stimulate, motivate, educate and enthuse learners.

Work placements should be monitored regularly before to ensure the quality of the learning experience. It would be beneficial if learners and supervisors were made aware of the requirements of this unit before any work-related activities, so that naturally occurring evidence can be collected at the time. For example, learners may have the opportunity to contribute to the maintenance or repair of land-based machinery and installations and they should be encouraged to ask for observation records and/or witness statements to be provided as evidence. Guidance on the use of observation records and witness statements is provided on the Pearson website.

Whichever delivery methods are used, it is essential that tutors stress the importance of the principles and application of health and safety guidance, good workshop practice, environmental issues and the need to manage the resource using legal methods. Although stated in learning outcome 4, these principles should be embedded at all stages of delivery and throughout all learning activities. Tutors must consider the safety of those working or coming into contact with the machinery and equipment to be maintained and/or repaired. Risk assessments must be undertaken before practical activities.

Tutors should consider integrating the delivery, private study and assessment relating to this unit with any other relevant units and assessment instruments the learner may also be taking as part of their programme of study.

Learning outcome 1 is likely to be delivered using formal lectures, discussions, supervised land-based workshop practicals and independent learner research. Learners will be introduced to the common types of hand and power tools found in most workshop situations. They will look at the safe and correct use of these tools and the maintenance and storage requirements that ensure their continued availability and safe operation. The learning outcome seeks to develop a sense of 'good working practice' wherever tools are used, to control costs and prevent injury to users and damage to machinery. Visiting expert speakers could add to the relevance of the subject for learners. For example, a mechanic working with land-based machinery could talk about their work and the tools they use to maintain and repair appropriate machinery.

Learning outcome 2 is likely to be delivered through a series of formal lectures, demonstrations and supervised land-based workshop practicals. The ability to correctly set up and use basic welding and cutting equipment in a safe manner will be developed further with continued practise, in the fabrication and re-fabrication activities undertaken in many workshop situations. Again good working practices will be stressed as skill development progresses through an understanding of the various techniques, their advantages and limitations to their application in supervised repair and/or fabrication activity.

Tutors are required to cover the four methods listed in the unit content but it is accepted that learners may not become proficient in all of these during the learning time available. Tutors may concentrate practical delivery on one of the systems and, if time and learner development allow, move on to other methods. Learners must be given the background theory and practical demonstrations for all the systems. Visiting expert speakers could add to the relevance of the subject for the learner. For example, a mechanic working with land-based machinery could talk about their work and the welding systems they use to maintain and repair appropriate machinery and installations.

Learning outcome 3 is likely to be delivered using formal lectures, discussion, supervised land-based workshop sessions and independent learner research. Learners will become aware of the safe use of basic maintenance and/or repair techniques on land-based machinery and equipment. In particular, learners must be made aware of service and maintenance schedules and be able to undertake basic tasks related to these. Learning outcome 3 gives tutors an opportunities to help learners apply and embed the skills and knowledge covered in learning outcomes 1, 2 and 4, in conducting repair and maintenance activities on a range of land-based machinery and equipment. Here the need for the application of good working practices will be reinforced as learners look at typical exercises in machinery maintenance and investigate the various sources of information and standards commonly found in workshop situations. Visiting expert speakers could add to the relevance of the subject for learners as in learning outcomes 1 and 2.

Learning outcome 4 is likely to be delivered using formal lectures, discussion, supervised land-based workshop practicals and independent learner research. Learners will become aware of the health and safety requirements of working in land-based workshops. Learners should be made aware of the difference between 'hazard' and 'risk' and understand the controls or precautions that can be used to limit them. Visiting expert speakers could add to the relevance of the subject for the learners. For example, a safety adviser or environment officer could talk about their work and the implications for the relevant land-based industries. Tutors should maintain current knowledge of legislation and ensure that all practical work is carried out safely and legally. It is not expected that learners will be able to state the exact provisions of various Acts of Parliament. However, they should be able to understand how relevant legislation affects them whilst carrying out practical tasks in the centre and workplace.

Outline learning plan

The outline learning plan has been included in this unit as guidance and can be used in conjunction with the programme of suggested assignments.

The outline learning plan gives **an indication of the volume of learning it would take the average learner** to achieve the learning outcomes. It is **indicative and is one way of achieving the credit value**.

Learning time should address all learning (including assessment) relevant to the learning outcomes, regardless of where, when and how the learning has taken place.

Topic and suggested assignments/activities and/assessment
Introduce unit and assessment processes. **Issue Assignment 1**: Workshop Skill Development (P1, P2, P5, P6, M1, D1) and **Assignment 2**: Welding Skill Development (P3, P4, M2, D1)
Hazards in the workshop and controlling risk – workshop/work area cleanliness.
Basic hand tool kit contents and uses. Safety, storage and maintenance.
Special tools and applications. Safety, storage and maintenance.
Tools for measuring, marking out and cutting. Safety storage, maintenance and sharpening.

Topic and suggested assignments/activities and/assessment
Practical tool use – mark out and cut, drill and grind. Simple component manufacture.
Fusion welding process – safety and PPE.
Hazards in the welding workshop and controlling risk.
Joint types and terminology.
Welding standards introduction and use.
Materials and suitability for welding.
Oxy-acetylene gas welding (and cutting) introduction and set up.
Manual metal arc welding introduction and set up.
Metal inert gas welding introduction and set up.
Fasteners in common use – form recognition, application and associated tools.
Rivets and riveting – recognition, application and tool requirements.
Circlips – application and use – handling and tool requirements.
Driveline component maintenance – belts.
Driveline component maintenance – chains.
Driveline component maintenance – shafts and bearings.
Driveline component maintenance – gears and couplings.
Service and maintenance operations – tractor units.
Service and maintenance operations – machines.
Assignment 3: Investigate Health and Safety Implications (P7, P8, M3, D2)
Sources of information and relevance.
Legislation and application to the workplace.
Employer responsibilities formalised.
Employee responsibilities.
Unit review.

Assessment

For P1, they will be expected to select and use hand and power tools safely to meet given objectives, maintaining or repairing land-based machinery or installations. Tutors should identify the given objectives which may depend on the specific requirements of the centre at the time of assessment. Where possible, the size and complexity of these should be the same for each learner to ensure the fairness of assessment. This criterion could be assessed along directly by observation by the tutor during practical activities when learners are undertaking identified tasks and recording their activities. If this format is used suitable evidence from guided activities would be observation records completed by the learner and tutor and accompanied by appropriate work logs or other relevant learner notes. If assessed during a placement, witness statements should be provided by a suitable representative and verified by the tutor. Guidance on the use of observation records and witness statements is provided on the Pearson website.

P3 requires learners to demonstrate the safe use of basic welding equipment and materials to produce a simple welded joint to meet given objectives. Evidence could be in the form of a test piece. Evidence for P4 could be linked to the work being undertaken for P3 in the form of an oral examination or report. Learners will be expected to use at least one type of welding system to achieve these criteria. Tutors should identify the given objectives which may include basic quality tolerances.

For P5, learners are required to use basic techniques safely to maintain or repair land-based machinery or installations to meet given objectives. Evidence for this may be linked to that being provided for other

grading criteria and may be in the form of a portfolio of evidence showing maintenance activities covering the unit content. Where possible, the given objectives for this criterion should be the same for each learner. However, it is appreciated that this may be difficult to organise for larger learner groups, in which case tutors should try to ensure fairness of assessment for all learners. For P6, learners could include in their portfolio a statement describing the reason for their particular approach to the tasks undertaken

P7 requires learners to explain the importance of health and safety in the workshop. This could take the form of an annotated report, a presentation using suitable software or a poster campaign for a given site.

P8 requires learners to produce a suitable risk assessment for the use of hand and/or power tools to meet given objectives. Evidence for this may be linked directly to tasks being undertaken to provide evidence for P1 to P6 and included in learners' portfolio. Tutors should identify the given objectives and a risk assessment pro forma, which should be in a format that is acceptable in a real-work situation.

For M1, learners are required to plan the work processes and tool requirements to carry out routine maintenance tasks on land-based machinery. Evidence for this may be linked directly to tasks being undertaken for the P1, P2, P5 and/or P6 in this unit and could be in the form of a checklist of tools and equipment, work processes with accompanying notes, extracts from manufacturers' schedules and/or materials and quantities lists, drawn up before executing the task.

For M2, learners are required to review a given simple welded fabrication task to suggest improvements. Evidence for this criterion may be linked directly to tasks being undertaken for P4 and P5 and could be in the form of a checklist of tools and equipment, work processes with accompanying notes, extracts of welding standards and materials and quantities lists, drawn up prior to executing the task.

For M3, learners are required to illustrate safe working procedures for an identified area of work in a land-based workshop environment. Evidence should be linked to the range of activities undertaken for other criteria and could take the form of a poster presentation, illustrated report or a pictorial presentation using suitable software.

For D1, learners are required to report on the activities undertaken and equipment and materials used to complete workshop maintenance and repair tasks on land-based machinery. Evidence may be linked directly to work being undertaken for other criteria or tutors could ask learners to evaluate other work that meets the necessary objectives for this criterion. Evidence could take the form of a reflective log attached to the activities undertaken for P1 to P6, M1 and M2, where learners describe the activities undertaken and evaluate whether the work has met the given objectives and, if not, why this may be.

D2 requires learners to explain the employee responsibilities under health and safety legislation when operating in a land-based workshop environment. Evidence could take the form of a web-based research project with downloads and extracts populating an illustrated report or animated presentation. This lends itself to group working. If this method of assessment is applied tutors should satisfy themselves of each individual's contribution achieve to the distinction grade.

Programme of suggested assignments

The following table shows a programme of suggested assignments that cover the pass, merit and distinction criteria in the grading grid. This is for guidance and it is recommended that centres either write their own assignments or adapt any Pearson assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1, P2, P5, P6, M1, D1	Workshop Skill Development	Learners set up systems to record workshop activities. Basic portfolio requirements to include risk assessments, information on tasks, toolage and material requirements. Work process statements and evaluative elements for each, providing evidence for merit and distinction criteria.	Observation. Course work portfolio. Presentation of work logs. Illustrated reports and/or AV presentations using suitable software.
P3, P4, M2, D1	Welding Skills Development	Learners to produce welded joint test pieces having selected and set up a welding system within the range of the unit content. Recording of risk assessments, work process statements and evaluative elements to provide evidence for merit and distinction criteria.	Observation and test pieces. Illustrated reports. Work logs.
P7, P8, M3, D2	Investigate Health and Safety Implications	Working in small groups, learners to review institutional approaches to health and safety and compare with legislative requirements to explain the importance to both employers and employees. Merit and distinction criteria could be evidenced through analysis.	Group work. AV/illustrated presentation. Poster campaign. Written reports.

Links to National Occupational Standards, other BTEC units, other BTEC qualifications and other relevant units and qualifications

This unit forms part of the BTEC land-based sector suite. This unit has particular links with:

Level 2	Level 3
Introduction to Land-based Machinery Operations	Undertaking Land-based Workshop Practice
Participate in Providing Estate Maintenance	

Essential resources

Facilities required for this unit include regular and routine supervised access to appropriately resourced land-based workshops.

Sufficient equipment and materials should be available to allow learners to gain experience of a range of powered and non-powered tools for example powered drills, grinders, saws, MMA welders, MIG welders, brazing equipment and hand tools.

Access to resources should be sufficient to allow all learners adequate opportunity to develop practical competence and confidence over a period of time.

Employer engagement and vocational contexts

The unit has a very practical focus and in this respect employer engagement will provide the modern context into which workshop skills and employers and manufacturer requirements for land-based machinery and equipment can be placed.

Good employer links will also help secure a valuable resource which will benefit of learners. Work placement opportunities should be actively sought alongside visits by experienced practitioners to illustrate current equipment, trends and practice in maintenance and repair operations. Learners could be encouraged to develop links with employers and arrange visits and demonstrations.

Indicative reading for learners

Textbooks

Agate E – *Tool Care – A Maintenance and Workshop Manual* (British Trust for Conservation Volunteers, 2000) ISBN 978-0946752249

Bell B – *Farm Machinery* (Old Pond Publishing, 2008) ISBN 978-1903366684

Gibson S and Smith A – *Basic Welding* (Thomson Learning, 1993) ISBN 978-0333578537

Shippen J and Turner J C – *Basic Farm Machinery* (Butterworth-Heinemann, 1980) ISBN 978-0080249117

Journals

Farmers Guardian

Farmers Weekly

Profi International

Websites

www.defra.gov.uk	Department for Environment Food and Rural Affairs
www.environment-agency.gov.uk	Environment Agency
www.hse.gov.uk	Health and Safety Executive
www.lantra.co.uk	Lantra

Delivery of personal, learning and thinking skills (PLTS)

The following table identifies the PLTS opportunities that have been included within the assessment criteria of this unit:

Skill	When learners are …
Independent enquirers	exploring the safe use of power tools
Creative thinkers	connecting with others' experiences of workshop hazards and safety
Reflective learners	considering the hazards and risks associated with workshops
Team workers	working with others to use basic welding equipment
Self-managers	organising safe and hazard free workshop activity.

Although PLTS opportunities are identified within this unit as an inherent part of the assessment criteria, there are further opportunities to develop a range of PLTS through various approaches to teaching and learning.

Skill	When learners are …
Independent enquirers	investigating tool use and maintenance reviewing specifications for welded joints
Creative thinkers	analysing health and safety poster information creating poster campaigns and risk assessments
Reflective learners	stating reasons for tool and equipment usage stating reasons for choice of techniques
Team workers	working on practical tasks researching health and safety information
Self-managers	stating personal reasons for tool and equipment usage stating personal reasons for choice of techniques
Effective participators	participating in practical activities participating in group-work.

Further information

For further information please call Customer Services on 020 7010 2188 (calls may be recorded for training purposes) or email TeachingLandBasedStudies@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

National Occupational Standards relevant to these qualifications can be obtained online from www.ukstandards.org.uk.

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.

The training we provide:

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

Our training is underpinned by the LLUK standards for those preparing to teach and for those seeking evidence for their continuing professional development.

Annexe A

The Pearson BTEC qualification framework for the environmental and land-based sector

Progression opportunities within the framework.

Level	General qualifications	BTEC full vocationally-related qualifications	BTEC Short Courses	NVQ/occupational
5		Pearson BTEC Level 5 HND Diplomas in Animal Management, Environmental Conservation, Horse Management, Horticulture		
4		Pearson BTEC Level 4 HNC Diplomas in Animal Management, Environmental Conservation, Horse Management, Horticulture		
3	Pearson Level 3 Diploma in Environmental and Land-based Studies	Pearson BTEC Level 3 Certificates, Subsidiary Diplomas, Diploma and Extended Diplomas in Agriculture, Animal Management, Blacksmithing and Metalworking, Countryside Management, Fish Management, Floristry, Forestry and Arboriculture, Horse Management, Horticulture, Land-based Technology		Level 3 Diploma in Work-based Environmental Conservation
2	Pearson Level 2 Diploma in Environmental and Land-based Studies	Pearson BTEC Level 2 Certificate, Extended Certificate and Diploma in Agriculture, Animal Care, Blacksmithing and Metalworking, Countryside and Environment, Fish Husbandry, Floristry, Horse Care, Horticulture, Land-based Technology		Level 2 Diploma in Work-based Environmental Conservation
1	Pearson Level 1 Diploma in Environmental and Land-based Studies	BTEC Foundation Learning in Land-based Studies	Pearson Level 1 Qualifications in Caring for Horses	
Entry		BTEC Foundation Learning in Land-based Studies		

Annexe B

Grading domains: BTEC Level 2 generic grading domains

Grading domain 1	Indicative characteristics – merit	Indicative characteristics – distinction
Application of knowledge and understanding (Learning outcome stem *understand* or *know*)	• Show depth of knowledge and development of understanding in given situations (for example explain why, make judgements based on analysis). • Apply and/or select relevant concepts. • Apply knowledge to different contexts. • Apply knowledge to non-routine contexts (ie assessor selection). • Make comparisons. • Show relationships between pass criteria.	• Synthesise knowledge and understanding across pass/merit criteria. • Evaluate concepts/ideas/actions. • Analyse/research and make recommendations. • Judges implications of application of knowledge/understanding. • Applies knowledge and understanding to complex activities/contexts.
Grading domain 2	**Indicative characteristics – merit**	**Indicative characteristics – distinction**
Development of practical and technical skills (Learning outcome stem *be able to*)	• Use advanced techniques/processes/ skills successfully. • Act under limited supervision/ demonstrate independence (note: pass cannot require support). • Apply to non-routine activities. • Demonstrate within time and/or resource constraints. • Produce varied solutions (including non-routine). • Modify techniques/processes to situations.	• Demonstrate creativity/originality/own ideas. • Apply skill(s) to achieve higher order outcome. • Select and use 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 of application of techniques/processes for new situations.

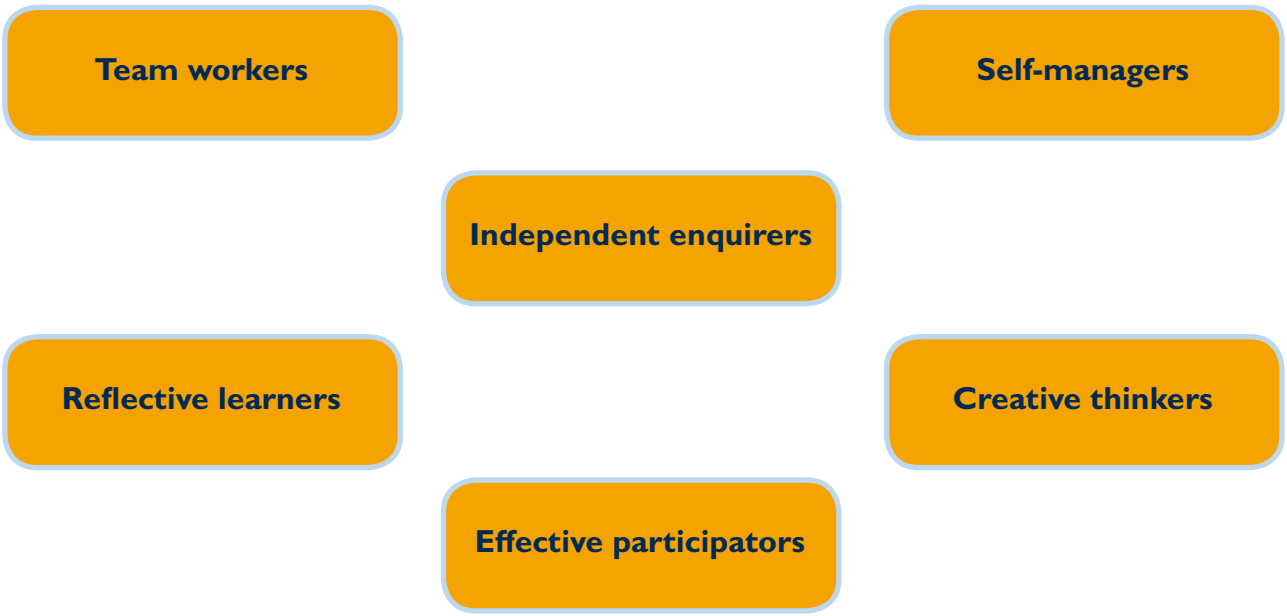
Grading domain 3	Indicative characteristics – merit	Indicative characteristics – distinction
Personal development for occupational roles (Any learning outcome stem)	• Takes responsibility in planning and undertaking activities. • Reviews own development needs. • Finds and uses relevant information sources. • 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. • 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 using appropriate technical/professional language. • Makes judgements in contexts with explanations. • Explains how to contribute within a team. • Makes adjustments to meet the needs/ expectations of others (negotiation skills). • Select and justify solutions for specified problems.	• Presents self and communicates information to meet the needs of a typical audience. • Takes decisions in contexts with justifications. • Produces outputs subject to time/ resource constraints. • Reflects on own contribution to working within a team. • Generate new or alternative solutions to specified problems.

Annexe C

Personal, learning and thinking skills

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

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
- manage their emotions, and build and maintain relationships.

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
Manage their emotions, and build and maintain relationships.	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

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

Personal, learning and thinking skills	Unit							
	9	10	11	12	13	14	15	16
Independent enquirers	✓	✓	✓	✓	✓	✓	✓	✓
Creative thinkers	✓					✓		✓
Reflective learners	✓				✓		✓	✓
Team workers				✓	✓			✓
Self-managers	✓	✓	✓	✓	✓			✓
Effective participators				✓	✓			✓
✓ – opportunities for development								

Annexe D

Wider curriculum mapping

Study of the Pearson BTEC Level 2 Firsts in Blacksmithing and Metalworking gives 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 Pearson BTEC Level 2 Firsts in Blacksmithing and Metalworking makes a positive contribution to wider curricular areas as appropriate.

Spiritual, moral, ethical, social and cultural issues

The qualification contributes to an understanding of:

- social and cultural issues – for example issues around the use of metals in society for example ornamental metal design.

Citizenship issues

Learners undertaking the Pearson BTEC Level 2 Firsts in Blacksmithing and Metalworking will have the opportunity to develop their understanding of citizenship issues, for example public and private involvement in metal and rural crafts.

Environmental issues

Learners undertaking the Pearson BTEC Level 2 Firsts in Blacksmithing and Metalworking will have the opportunity to develop their understanding of environmental issues throughout the units.

European developments

Much of the content of the Pearson BTEC Level 2 Firsts in Blacksmithing and Metalworking applies throughout Europe even though delivery is in a UK context.

Health and safety considerations

The Pearson BTEC Level 2 Firsts in Blacksmithing and Metalworking are practically based and health and safety issues are encountered throughout the units.

Equal opportunities issues

Equal opportunities issues are implicit throughout the Pearson BTEC Level 2 Firsts in Blacksmithing and Metalworking.

Wider curriculum mapping

Level 2

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8
Spiritual			✓	✓	✓	✓	✓	✓
Moral and ethical			✓	✓	✓	✓	✓	✓
Social and cultural			✓	✓	✓	✓	✓	✓
Citizenship issues			✓	✓	✓	✓	✓	✓
Environmental issues	✓	✓	✓	✓	✓	✓	✓	✓
European developments			✓	✓	✓	✓	✓	✓
Health and safety considerations	✓	✓	✓	✓	✓	✓	✓	✓
Equal opportunities issues			✓	✓	✓	✓	✓	✓

	Unit 9	Unit 10	Unit 11	Unit 12	Unit 13	Unit 14	Unit 15	Unit 16
Spiritual	✓							
Moral and ethical	✓							
Social and cultural	✓							
Citizenship issues	✓							
Environmental issues	✓	✓	✓		✓	✓	✓	✓
European developments	✓	✓	✓	✓				
Health and safety considerations	✓	✓	✓		✓	✓	✓	✓
Equal opportunities issues	✓	✓	✓					

Annexe E

National Occupational Standards/mapping with NVQs

The grid below maps the knowledge covered in the Pearson BTEC Level 2 Certificate, Extended Certificate and Diploma in Animal Care against the underpinning knowledge of the Level 2 NVQ in Animal Care, Level 2 NVQ in Environmental Conservation and Level 2 NVQ in Livestock Production.

KEY

✓ indicates that the Pearson BTEC Level 2 Firsts cover all of the underpinning knowledge of the NVQ unit

\# indicates partial coverage of the NVQ unit

a blank space indicates no coverage of the underpinning knowledge

	Units															
NVQs	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Level 2 NVQ in Farriery																
Far2 Prepare, light and maintain the forge fire	#															
FA9 Make horseshoes		#														
FA13 Fabricate horseshoes and tools	#	#														
Level 2 NVQ in Fabrication and Welding																
Unit 4 Joining Materials by the Manual Metal Arc Welding Process										#						
Unit 5 Joining Materials by the Manual MIG/MAG and Other Continuous Wire Welding Processes										#						
Unit 6 Joining Materials by the Manual TIG and Plasma-arc Welding Processes										#						
Unit 7 Joining Materials by the Manual Gas Welding Process										#						
Unit 8 Producing Fillet Welded Joints using a Manual Welding Process										#						
Unit 21 Marking Out Components for Fabrication		#									#	#				
Unit 22 Cutting Sheet Metal to Shape using Hand and Machine Tools											#					
Unit 23 Forming Sheet Metal using Hand and Machine Tools											#					

	Units															
NVQs	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
Unit 24 Producing Sheet Metal Assemblies											#					
Unit 29 Bonding Engineering Materials using Adhesives											#					
Level 2 NVQ in Performing Engineering Operations																
Unit 22 Producing Sheet Metal Components and Assemblies											#					
Unit 27 Preparing and Using Manual Metal Arc Welding Equipment										#						
Unit 28 Preparing and Using Manual Metal TIG or Plasma-arc Welding Equipment										#						
Unit 29 Preparing and Using Manual MIG/MAG and Other Continuous Wire Welding Equipment										#						
Unit 30 Preparing and Using Gas Welding Equipment										#						
Unit 202 Maintain the health and well-being of horses													#			
Level 2 NVQ in Design																
DES1 Apply research on the history and theory of design to your own design activities			#	#	#	#	#	#	#							
DES2 Apply design industry knowledge to inform your own design work practice and work			#	#	#	#	#	#	#							
DES3 Use Critical Thinking Techniques in your design work			#	#	#	#	#	#	#							
DES4 Communicate the importance of the design brief					#		#	#	#							
DES5 Follow a design process			#	#	#		#	#	#							
DES6 Work effectively with others in a creative environment					#			#	#							
DES7 Contribute to the production of prototypes, models, mock-ups, samples or test pieces			#	#	#			#	#							
DES8 Explore the use of colour in a creative environment			#	#	#			#	#							
DES9 Research, test and apply techniques for the design of products			#	#	#		#	#	#							

	Units															
NVQs	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**
DES10 Create visual designs			#	#	#		#	#	#							
DES11 Provide written information in relation to your design work			#	#	#		#	#	#							
DES12 Make a presentation			#	#	#	#	#	#	#							
DES14 Explore the history and social impact of creativity and how it can influence your own design work					#	#										
DES15 Research and evaluate the nature of design in a specific industry context						#		#	#							
DES18 Interpret the design brief and follow the design process					#		#	#	#							
DES21 Articulate, present and debate ideas in a creative environment							#									
DES23 Create 2D Designs using a Computer Aided Design System			#					#								
DES24 Create 3D Models using a Computer Aided Design System				#				#								
DES28 Developing your own design offer							#									
DES32 Apply concepts and theories of creativity and innovation to your own design work					#			#	#							
DES36 Develop and extend your design skills and practices							#									
DES38 Manage design realisation					#											
DES39 Manage a design project					#											

Annexe F

Unit mapping overview

BTEC First in Animal Care legacy (specification end date 31/08/2010)/new versions of the BTEC First qualifications in Animal Care (specification start date 01/09/2010) – the BTEC Level 2 Certificate in Animal Care, BTEC Level 2 Extended Certificate in Animal Care and the BTEC Level 2 Diploma in Animal Care.

Old units / New units	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 1	F													
Unit 2			P											
Unit 3			P											
Unit 4			P				P							
Unit 5		P												
Unit 6			P				P							
Unit 7				F										
Unit 8					F									
Unit 9						F								
Unit 10								F						
Unit 11									P					
Unit 12										F				
Unit 13											F			
Unit 14												F		
Unit 15													F	
Unit 16														F

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))

Annexe G

Examples of calculation of qualification grade above pass grade

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

The generic examples below demonstrate how the qualification grade above pass is calculated using the following two tables which are also shown in the section earlier on in the specification *Calculation of the qualification grades above pass grade*.

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 1	3	4	5
Level 2	**5**	**6**	**7**
Level 3	7	8	9

Learners who achieve the correct number of points within the ranges shown in the 'qualification grade' table below will achieve the qualification merit or distinction or distinction* grade.

Qualification	Points range above pass grade		
	Merit	Distinction	Distinction*
BTEC Level 2 Certificate	85–94	95–99	100 and above
BTEC Level 2 Extended Certificate	170–189	190–199	200 and above
BTEC Level 2 Diploma	340–379	380–399	400 and above

Example 1

Achievement of pass qualification grade

A learner completing a 15-credit Pearson BTEC Level 2 Certificate achieves the credit required to gain a pass qualification grade and does not achieve the points to gain a merit grade.

	Level	Credit	Grade	Grade points	Points per unit = credit x grade
Unit 1	2	5	Pass	5	5 × 5 = 25
Unit 2	2	5	Pass	5	5 × 5 = 25
Unit 3	2	5	Merit	6	5 × 6 = 30
Qualification grade totals		**15**	**Pass**		**80**

Example 2

Achievement of merit qualification grade

A learner completing a 15-credit Pearson BTEC Level 2 Certificate achieves the points required to gain a merit qualification grade.

	Level	Credit	Grade	Grade points	Points per unit = credit x grade
Unit 1	2	5	Pass	5	5 × 5 = 25
Unit 2	2	5	Merit	6	5 × 6 = 30
Unit 3	2	5	Merit	6	5 × 6 = 30
Qualification grade totals		**15**	**Merit**		**85**

Example 3

Achievement of distinction qualification grade

A learner completing a 15-credit Pearson BTEC Level 2 Certificate achieves the points required to gain a distinction qualification grade.

	Level	Credit	Grade	Grade points	Points per unit = credit x grade
Unit 1	2	5	Merit	6	5 × 6 = 30
Unit 2	2	5	Merit	6	5 × 6 = 30
Unit 3	2	5	Distinction	7	5 × 7 = 35
Qualification grade totals		**15**	**Distinction**		**95**

Example 4

Achievement of merit qualification grade

A learner completing a 30-credit Pearson BTEC Level 2 Extended Certificate achieves the points required to gain a merit qualification grade.

	Level	Credit	Grade	Grade points	Points per unit = credit x grade
Unit 1	2	5	Merit	6	5 × 6 = 30
Unit 2	2	5	Pass	5	5 × 5 = 25
Unit 3	2	5	Distinction	7	5 × 7 = 35
Unit 6	2	10	Pass	5	10 × 5 = 50
Unit 8	3	5	Pass	7	5 × 7 = 35
Qualification grade totals		**30**	**Merit**		**175**

Example 5

Achievement of merit qualification grade

A learner completing a 60-credit Pearson BTEC Level 2 Diploma achieves the points required to gain a merit qualification grade.

	Level	Credit	Grade	Grade points	Points per unit = credit x grade
Unit 1	2	5	Merit	6	5 × 6 = 30
Unit 2	2	5	Pass	5	5 × 5 = 25
Unit 3	2	5	Distinction	7	5 × 7 = 35
Unit 6	2	10	Merit	6	10 × 6 = 60
Unit 9	1	5	Merit	4	5 × 4 = 20
Unit 10	2	10	Distinction	7	10 × 7 = 70
Unit 11	2	10	Merit	6	10 × 6 = 60
Unit 14	2	10	Merit	6	10 × 6 = 60
Qualification grade totals		**60**	**Merit**		**360**

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