BTEC Level 2

Specification

BTEC Firsts

Pearson BTEC Level 2 Certificate, BTEC Level 2 Extended Certificate and BTEC Level 2 Diploma in Fish Husbandry

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Issue 3

A PEARSON COMPANY

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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 Fish Husbandry (QCF)

Edexcel BTEC Level 3 Extended Certificate in Fish Husbandry (QCF)

Edexcel BTEC Level 3 Diploma in Fish Husbandry (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 Fish Husbandry

Pearson BTEC Level 2 Extended Certificate in Fish Husbandry

Pearson BTEC Level 2 Diploma in Fish Husbandry

These qualifications have been accredited to the national framework and are eligible for public funding as determined by the Department for Education (DfE) under Sections 96 and 97 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 Qualifications 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 code.

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

The QNs for the qualifications in this publication are:

Pearson BTEC Level 2 Certificate in Fish Husbandry	500/8359/4
Pearson BTEC Level 2 Extended Certificate in Fish Husbandry	500/8358/2
Pearson BTEC Level 2 Diploma in Fish Husbandry	500/8366/1

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 offered by further education and sixth-form colleges, schools and other training providers. Since their introduction in 1983, their purpose, approaches to teaching, learning and assessment have become well established and understood by teaching professionals, employers and learners.

The BTEC First qualifications within this specification are:

- Pearson BTEC Level 2 Certificate in Fish Husbandry
- Pearson BTEC Level 2 Extended Certificate in Fish Husbandry
- Pearson BTEC Level 2 Diploma in Fish Husbandry.

For clarity and continuity the above qualifications are referred to generically as BTEC Firsts, where appropriate, They 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)	BTEC Firsts (for delivery from September 2010)
Edexcel Level 2 BTEC First Diploma	Pearson BTEC Level 2 Diploma
Edexcel Level 2 BTEC First Certificate	Pearson BTEC Level 2 Extended Certificate
Not applicable	Pearson BTEC Level 2 Certificate

BTEC Firsts are 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 assessent 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 available in the following sizes:

- Certificate – 150 TQT (15 credits, 90 GLH)
- Extended Certificate – 300 TQT (30 credits, 180 GLF)
- 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 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.

The predecessor qualification to the BTEC Level 2 Extended Certificate is the Edexcel Level 2 BTEC First Certificate accredited onto the National Qualifications Framework, which has the same equivalences, overall size and focus as the revised-accredited qualification.

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 Fish Husbandry

The BTEC Firsts in Fish Husbandry have been developed in the environmental and land-based sector to:

- provide education and training for learners interested in employment and/or further education in the environmental and land-based and/or associated sectors
- give opportunities for employees who currently work in agricultural and land management industries to achieve a nationally recognised Level 2 vocationally specific qualification
- give full-time learners the opportunity to enter employment in the environmental and land-based sector or to progress to vocational qualifications such as the Pearson BTEC Level 3 Nationals in Fish Husbandry
- 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 Fish Husbandry

The BTEC Firsts in Fish Husbandry have been developed to provide entry and progression into and within fish farming, sport fishery management and aquatics industries that fall within the environmental and land-based sector. Lantra, the Sector Skills Council for the environmental and land-based industries has identified knowledge, understanding and, technical skills that employers need from learners entering the sector in the coming years. Pearson has included these in the development of units that make up these qualifications.

These qualifications are part of a wide suite of environmental and land-based qualifications offered by Pearson and are designed primarily for learners aged between 14 and 19 who seek 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 development. The qualifications are aimed at those interested in fish farming, sport fishery management and/or aquatics. 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 in 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 while 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 Fish Husbandry relate to the following NOS:

- Level 2 Fisheries Management
- Level 2 Gamekeeping and Wildlife Management
- Level 2 Agricultural Crop Production

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 Level 3 BTEC units in this qualification 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.

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

Pearson BTEC Level 2 Extended Certificate

1 Qualification credit value: a minimum of 30.

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

Pearson BTEC Level 2 Diploma

1 Qualification credit value: a minimum of 60.

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

3 Mandatory unit credit: 20.

4 Optional unit credit: 40.

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

Pearson BTEC Level 2 Certificate in Fish Husbandry

The Pearson BTEC Level 2 Certificate in Fish Husbandry is 15 credits and has 90 guided learning hours (GLH) consisting of optional units 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 Fish Husbandry			
Unit	**Optional units**	**Credit**	**Level**
3	Introduction to Fish Health	**5**	**2**
5	Introduction to Aquatic Ecology	**10**	**2**
7	Introduction to Fish Farming	**10**	**2**
8	Introduction to Game and Coarse Angling	**10**	**2**
9	Undertake Freshwater Sport Fishery Management	**10**	**2**
10	Introduction to Caring for Ornamental Aquatics	**10**	**2**

Pearson BTEC Level 2 Extended Certificate in Fish Husbandry

The Pearson BTEC Level 2 Extended Certificate in Fish Husbandry is 30 credits and has 180 guided learning hours qualification (GLH) consisting of optional units 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 Fish Husbandry			
Unit	**Optional units**	**Credit**	**Level**
1	Undertake Work Related Experience in the Land-based Industries	**10**	**2**
2	Environmental and Land-based Business	**10**	**2**
3	Introduction to Fish Health	**5**	**2**
4	Introduction to Fish Biology	**5**	**2**
5	Introduction to Aquatic Ecology	**10**	**2**
6	Participate in Providing Estate Maintenance	**10**	**2**
7	Introduction to Fish Farming	**10**	**2**
8	Introduction to Game and Coarse Angling	**10**	**2**
9	Undertake Freshwater Sport Fishery Management	**10**	**2**
10	Introduction to Caring for Ornamental Aquatics	**10**	**2**

Pearson BTEC Level 2 Diploma in Fish Husbandry

The Pearson BTEC Level 2 Diploma in Fish Husbandry 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 Fish Husbandry			
Unit	**Mandatory units**	**Credit**	**Level**
1	Undertake Work Related Experience in the Land-based Industries	**10**	**2**
2	Environmental and Land-based Business	**10**	**2**
Unit	**Optional units**		
3	Introduction to Fish Health	**5**	**2**
4	Introduction to Fish Biology	**5**	**2**
5	Introduction to Aquatic Ecology	**10**	**2**
6	Participate in Providing Estate Maintenance	**10**	**2**
7	Introduction to Fish Farming	**10**	**2**
8	Introduction to Game and Coarse Angling	**10**	**2**
9	Undertake Freshwater Sport Fishery Management	**10**	**2**
10	Introduction to Caring for Ornamental Aquatics	**10**	**2**

Assessment and grading

In BTEC Firsts all units are internally assessed.

All 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 *Annexe B* which shows the merit and distinction indicative characteristics.

Guidance

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

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

All the assignments created by centres should be reliable and fit for purpose, and should 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 and posters, along with projects, performance observation and time-constrained assessments.

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

The assessment and grading criteria must be clearly indicated 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 G* for examples of calculation of qualification grade above pass grade.

Quality assurance of centres

Pearson's qualification specifications set out the standard to be achieved by each learner in order 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 it is 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 had approval for its existing 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 relating to 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; for 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 it uses do not require undue bureaucratic processes from 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 used to do this for BTEC First and National programmes accredited under the Regulated Qualifications Framework (RQF) include:

- 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
- over-arching 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.

Guided learning hours are defined as all the times when a tutor, trainer or facilitator is present to give specific guidance towards the learning aim being studied on a programme. This definition includes lectures, tutorials and supervised study in, for example, open learning centres and learning workshops. It also includes time spent by staff assessing learners' achievements. It does not include time spent by staff in day-to-day marking of assignments where the learner is not present.

Centres are advised to consider this definition 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 or 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 demonstrating one way of planning the delivery and assessment of the unit. The outline learning plan can be used in conjunction with the programme of suggested assignments.

Where the qualification has been designated and approved as a Technical Certificate, and forms part of an Apprenticeship scheme, particular care needs to be taken to build strong links between the learning and assessment for the BTEC 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 standard 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 National Database of Accredited Qualifications (NDAQ). The catalogue includes qualifications which have the approval of the Diploma Development Partnership (DDP) and will expand over time as more qualifications are approved. To access the catalogue, go to www.ndaq.org.uk and select 'Browse Diploma Qualifications'.

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 with which they are associated and they are also mapped in Annexe C. Further opportunities for learners to demonstrate these skills may also become apparent as learners progress with 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 an environmental and land-based subject 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 LDfE funding lists Section 96 and Section 97.

Access arrangements and special considerations

Pearson's policy on access arrangements and special considerations for BTEC and Edexcel 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 Edexcel NVQ Qualifications*, which can be found on the Pearson qualifications website (www.Pearson.com). This policy replaces the previous Edexcel 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, representing 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 as defined 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 to be gained while studying it. 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 how 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 amplifies 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: Undertake Work Related Experience in the Land-based Industries

Unit code: H/600/9335

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 work related experience 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

Work experience is an important part of any vocational course.

Learners on vocational courses should have experience of the type of work that they hope to do and an idea of the expectations of those who may employ them. Actual work experience may be gained by a number of routes, eg as part of an industrial placement while at college; while working on a planned daily or weekly basis on the college's commercial and/or educational facilities; while undertaking voluntary work within the industry; in the form of previous relevant and current work experience in the industry; or as a member of a group of learners invited to carry out practical work in, for example, a country park, farm or animal care centre. All of the above may be useful in gathering evidence against the assessment and grading criteria for this unit.

Work related experience should not just involve actually undertaking activities in a work environment. Talking to, listening to and watching those with experience of particular industries and/or situations is a very valid way of beginning to understand the work involved and what is required of the employee.

Learning outcomes

On completion of this unit a learner should:

1 Know the range and scope of job roles within an environmental and land-based industry

2 Be able to use relevant documents and skills relating to work experience

3 Be able to plan and review self-development during work experience

4 Be able to report on the work experience.

Unit content

1 Know the range and scope of job roles within an environmental and land-based industry

Environmental and land based industry: range of sectors represented eg production (livestock, crops), leisure/tourism, equestrian, forestry/arboriculture, fishery management, aquaculture, farriery, floristry, fencing, gamekeeping, animal care/welfare, conservation, countryside management, land-based engineering, landscaping and horticulture

Job roles: the range of roles available within the chosen sector

2 Be able to use relevant documents and skills relating to work experience

Documents: job advertisement; CV; covering letter; application form; job/role description; essential and desirable personal requirements; using these documents in an appropriate way

Skills: identification of skills required to work in the sector eg interpersonal skills, communication, technical knowledge, practical skills; use of skills

3 Be able to plan and review self-development during work experience

Personal skills: identify own skills

Planning self-development: methods of reviewing own development needs eg skills audit

Self-development: methods of reviewing self-development eg meeting/discussion with supervisor, self review

4 Be able to report on the work experience

Evidence required: description of employer's business; description of employees' roles; pictorial evidence about the employer/site eg maps, plans, photos, leaflets; description of how the business makes income; your own role within the organisation and tasks you carried out

Methods of presentation: verbal, written, visual

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 different types of jobs within an environmental and land-based industry [IE]	**M1**	prepare a person specification for a job in the chosen sector	**D1**	review a job application against a given person specification
P2	describe the skills and qualifications required for different types of jobs within an environmental and land-based industry [CT]				
P3	locate three advertisements for jobs from different sources available within the environmental and land-based industry [IE]	**M2**	identify common themes from three job advertisements	**D2**	prepare a job advertisement.
P4	produce an application for work experience in the environmental and land-based sector [IE, SM]				
P5	prepare for an interview for work experience [IE, SM]	**M3**	prepare questions to be used in a job interview.		
P6	undertake an interview for work experience [IE, SM]				
P7	review own skills and experience against the requirements for a specific industry [RL]				
P8	prepare a self-development plan for work experience [RL]				

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:**
P9 review a self-development plan during and after work experience [RL]		
P10 gather and prepare evidence during the work experience [IE]		
P11 present information to others on work experience. [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 both practical and written assessment and, most importantly, will have links to industrial experience placements.

Tutors could use a wide range of techniques including lectures, discussions, seminar presentations, visiting speakers, site visits and practicals, research using the internet and/or library resources and the use of personal and/or industrial experience. Delivery should stimulate, motivate, educate and enthuse the learner.

Work placements should be monitored regularly to ensure the quality of the learning experience. Learners and supervisors should be aware of the requirements of this unit prior to any work related activities, so that naturally occurring evidence might be collected at the time. Learners 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 Edexcel website.

Work related experience could be as part of an industrial placement while at college; daily or weekly work at the college's commercial and/or educational facilities; voluntary work within the sector, eg in an animal care centre, country park, farm, estate, garden centre etc.

Tutors could integrate the delivery, private study and assessment relating to this unit with any other relevant units and assessment instruments used in the learner's programme of study. Learners must be given supported time to plan and review their own development. They should do a minimum of 150 hours or related study/work to complete this unit successfully. Learners could keep a diary/log to show that they have achieved the requirement of completing their work experience. Tutors should encourage as wide a range of experience as possible so that learners develop relevant knowledge and skills.

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: Advertising a Job in the Land-based Sector (P1, P2, P3, M1, M2, D1, D2) Introduction of brief.
Theory session.
Research the industry and roles, research advertisements, write person specification, prepare questions, review job application, prepare job advert.
Assignment 2: Getting a Job in the Land-Based Sector (P4, P5, P6, M3) Introduction of brief.
Theory session.
Compete job application, prepare answers to likely questions, undertake interview.

Topic and suggested assignments/activities and/assessment
Assignment 3: Workplace Self-Development (P7, P8, P9) Introduction of brief.
Theory session.
Review own skills, prepare self development plan, review self development plan.
Assignment 4: My Work Experience Placement (P10, P11) Introduction of brief.
Theory session.
Gather information, prepare and present information.
Work experience.
Unit review.

Assessment

For P1, learners must describe different types of jobs within an environmental and land-based industry. This should be a sector of the industry in which learners have an interest or which relates to their vocational or chosen course of study or intended future career.

P2 requires learners to describe the skills and qualifications required for different types of jobs within an environmental and land-based industry. The evidence could focus on two or three different jobs from within the same sector and describe both the common skills and qualifications as well as the areas where the requirements differ.

For P3, learners must locate three advertisements for jobs from different sources available within the environmental and land-based industry. They must provide evidence that they have looked at three different sources for these advertisements.

P4 must include evidence that the learner can produce an application for work experience in the environmental and land-based sector. This could be done on a pro forma application designed by the learners themselves or one provided by the tutor.

For P5, learners must prepare for an interview for work experience. They will evidence this by providing a list of answers to questions which it is considered are likely to be asked by an interviewer. These questions may be provided/suggested by the tutor or could be drawn up by the learner. The evidence could be presented in the form of an interview (see P6) or could be presented as written answers or an audio recording of them practising the answers.

To meet P6, learners will undertake an interview for work experience, where they will have the opportunity to present their answers to the questions they prepared for P5, and to show other aspects of preparation such as appropriate personal presentation, and asking appropriate questions. This could either be evidenced via mock interviews with other learners acting as the interview panel and using the evidence they have prepared for M1 and M3, or it could be evidenced by a real interview for a work experience placement, supported by a witness statement from the interviewer.

For P7, learners will provide evidence that they can review their own skills and experience against the requirements for a specific industry. This can be linked closely with the evidence presented for P2, with learners identifying their 'skills gap' either through a skills audit or similar.

To evidence P8, learners will need to prepare a self-development plan for their work experience placement. This could be done on a pro forma provided by, or in a format suggested by the tutor. The plan will identify areas of improvement that the learners need to develop during their work experience, and show how the

learners are going to do this.

For P9, learners need to review the self-development plan during and after work experience. Evidence could be in the form of witness statements or tutor observations to show that the plan had been discussed and reviewed, that progress to date had been discussed and how future progress may occur.

To meet P10, learners must gather and prepare evidence during the work experience. This evidence will cover the content.

For P11, learners must present information to others on work experience. This can be done in any suitable format – it may be a poster with photos, leaflets and learner-prepared text about the employer; it could be a verbal presentation with accompanying slides/pictorial evidence; or it could be an audio-visual presentation made at the placement.

For M1, learners need to prepare a person specification for a job in the chosen sector. The specification could be based on one of the advertisements researched in P3, and should show the major skills, qualities and qualifications required for that role, and an indication of whether these are essential or desirable.

To evidence M2, learners are required to identify common themes from three job advertisements – what are the main areas of commonality, are there things that all three have? It may also be that learners consider what differences there are between the advertisements. This could be presented in a poster format with annotations to show areas of difference/similarity.

For M3, learners need to prepare questions to be used in a job interview. This can be the same job for which the person specification has been produced. It is expected that a list of at least 10 questions is prepared.

For D1, learners must review a job application against a given person specification. This could be an application which has been produced by other learners for the purpose of meeting criterion P4, or it could be an example application form provided by the tutor.

To meet D2, learners will prepare a job advertisement. This will link in with the evidence required for P3 and M2 and could advertise the role for which the person is being sought in M1.

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 Edexcel assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1, P2, P3, M1, M2, D1, D2	Advertising a Job in the Land-Based Sector	You work for an employer in the land-based sector and are in the position of taking on a new staff member. Your manager has asked you to see what other roles exist with other similar employing organisations and what sort of skills and qualifications they are looking for, by sourcing different advertisements and identifying common themes in them. Once you have found that out, it is then your responsibility to write a person specification for the role you will advertise, prepare an advertisement to attract applicants, review an application against your criteria, and plan the questions you would ask in an interview.	Verbal or written report.

Criteria covered	Assignment title	Scenario	Assessment method
P4, P5, P6, M3	Getting a Job in the Land-Based Sector	You are looking for your first job in the land-based sector. You need to complete an application form for a job you would like to do, prepare for an interview by coming up with a list of questions you would want answered and having a job interview.	Application form. List of questions. Interview.
P7, P8, P9	Workplace Self-Development	To progress within any employment, self-development is an essential feature. This requires you to have a clear idea about what employers need from their employees and the skills and experience you have already got and those you need to build. You then need to prepare a plan to show how you might build the required skills and experience and to review this plan during and after work experience.	Report on what employers require of employees in the chosen sector. Self-development plan. Evidence of review of the plan during and after work experience.
P10, P11,	My Work Experience Placement	In order to inform other learners about your work experience placement, you need to provide them with information about it such as a description of the employer's business, a description of the other employees' roles, pictures of the organisation or site, a description of how the business makes income and a description of what you did while you were there.	Report on work experience placement.

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
Undertake Work Experience in the Land-based Industries	Undertake and Review Work Related Experience in the Land-based Industries

Essential resources

Learners require supervised access to suitable sites for work experience. Centres may need to provide transport to suitable sites. First aid facilities and appropriately trained staff are essential where practical activities are undertaken. For work placements away from the college, staff time must be made available as per individual college policies relating to work placements.

Employer engagement and vocational contexts

This unit focuses on skills and experience to be developed through preparing for, and undertaking, work experience. Centres are encouraged to create and develop links with local employers who can provide appropriate work experience.

Indicative reading for learners

Textbooks

James J – *You're Hired! Interview: Tips and Techniques for a Brilliant Interview* (Trotman, 2009) ISBN 9781844551781

Mills C – *You're Hired! CV: How to write a Brilliant CV* (Trotman, 2009) ISBN 9781844551774

Websites

www.countryside-jobs.com	Countryside Jobs Service
www.fwi.com	Farmers Weekly
www.growcareers.info	Horticultural Careers
www.land-force.org.uk/index.aspx	Land-based Jobs on-line
www.lantra.org.uk	Lantra Sector Skills Council
www.ruralslp.co.uk/index.aspx	Lantra on-line Competency Framework
www.naturenet.net	UK Countryside and Nature Conservation

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 jobs within the sector researching job advertisements and evaluating their relevance completing a job application preparing for, and participating in, a job interview gathering and preparing evidence during work experience
Creative thinkers	describing the skills and qualifications required for a job in the land-based sector
Reflective learners	preparing and reviewing a self-development plan presenting information to others on their work experience reviewing their own skills and experience
Self-managers	carrying out research.

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 …
Team workers	working with others to carry out interviews.

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	researching roles within the sector researching job advertisements
Access, search for, select and use ICT-based information and evaluate its fitness for purpose	researching roles within the sector researching job advertisements
ICT – Develop, present and communicate information	
Bring together information to suit content and purpose	developing a presentation about work experience
Present information in ways that are fit for purpose and audience	making the presentation about work experience
English	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	taking part in work experience making presentation about work experience
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	writing person specifications for job.

Unit 2: Environmental and Land-based Business

Unit code: F/600/9357

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 business within the environmental and land-based business, 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 to further education and training.

Unit introduction

Understanding how businesses and organisations fit into the land-based industry provides a foundation of knowledge from which more specialist study can follow. The environmental and land-based industries are wide-ranging, covering employment in many sectors.

Learners will investigate the different types of businesses and organisations in their specialist sector of the environmental and land-based industries, their characteristics and influences. Learners will look at current trends and issues affecting their industry.

All businesses operate within a framework of statutory legislation and other codes of practice. Learners will investigate a range of UK and EU legislation that impacts on their sector and employment within it.

To operate effectively, organisations need to perform a wide range of business and administrative tasks. Learners will develop skills in performing a range of tasks concerned with finance and banking, marketing and general administration. They will also consider how information technology can be used to perform a range of these tasks.

Learning outcomes

On completion of this unit a learner should:

1 Know an industry within the environmental and land-based sector

2 Know the relevant legislation and codes of practice within the environmental and land-based sector

3 Know common business operations

4 Know how to carry out simple administrative tasks.

Unit content

1 Know an industry within the environmental and land-based sector

Structure: features and characteristics of the industry – size, employment, main activities, geographical influence, economic contribution; different types of businesses and organisations and the type of goods and services they provide; size of these businesses/organisations eg numbers employed, area of land, size of enterprises; any regional differences; allied industries (what they are, the goods and services they supply and the role they play); trends and issues currently affecting the industry

Principal organisations and trade associations: roles and aims of key selected organisations in the industry – statutory eg Department for Environment Food and Rural Affairs (DEFRA), Health and Safety Executive, Department for Business Innovation and Skills, Environment Agency, Food Standards Agency; non-governmental, major land-owning or representative eg The Royal Society for the Prevention of Cruelty to Animals (RSPCA), British Veterinary Association, Royal Horticultural Society, Institute of Groundsmanship, Lantra Sector Skills Council, British Horse Society, National Farmers Union, National Trust

2 Know the relevant legislation and codes of practice within the environmental and land-based sector

Legislation and codes of practice: United Kingdom legislation – consideration of the main relevant current legislation relating to an industry in the land and environment sector eg Agriculture Tenancies Act 1995, Wildlife and Countryside Act 1981, Animal Health Act 2002, The Welfare of Animals (Transport) (Amendment) Order 1999, Environment Protection Act 1990, Environment Act 1995, Control of Pesticides Regulations 1986, Riding Establishments Act 1970, Horse Passports (England) Regulations 2004, Control of Dogs Order 1992, Dangerous Dogs Act 1991; codes of practice eg five freedoms welfare of farm or companion animals, Code of Good Agricultural Practice; European legislation – relevant European directives eg relating to employment, the environment and the specific industry in the land and environment sector

Employment law: the main relevant current legislation relating to employment eg Health and Safety at Work Act 1974, Control of Substances Hazardous to Health Regulations 1991, Working Time Regulations 1998, Disability Discrimination Acts 1995 and 2005, Employment Act 2002, National Minimum Wage Act 1998, Race Relations (Amendment) Act 2000, Sex Discrimination Act 1975

3 Know common business operations

Common IT software: examples of business uses of word processor (eg letters, notices), spreadsheets (eg records, timesheets), database (eg records), graphics (eg advertisements, posters), email; advantages and disadvantages of using IT for business tasks

Common business tasks: financial and banking – taking payments by cash and cheque, ordering procedure for supplies, invoices, types of bank account (current, savings, business) loans, overdraft, methods of payment (cheques, standing order, direct debit, electronic/internet); marketing – ways to promote a business (advertisements, promotional events, referral/word of mouth, importance of customer care), preparation of promotional materials; administrative tasks – file documents, complete simple records (eg production, customers), check stock levels and complete stock control records, complete simple single entry cash analysis book, communicate using written and electronic media; importance of accuracy, confidentiality, security and data back up of business records

4 Know how to carry out simple administrative tasks

Preparation, presentation, sorting and retrieval of information: use of IT and paper filing systems , completion of simple business records, preparation of business documents (eg letters, advertisements)

Accounting and administrative tasks: completion of orders, invoices, cheques, complete stock records, single entry cash analysis book; purpose of accounting and administrative tasks

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 structure of one industry within the environmental and land-based sector covering: ◊ size ◊ employment ◊ main activities ◊ geographical influence ◊ economic contribution [IE]	**M1** explain the roles of principal organisations within an industry in the environmental and land-based sector	**D1** discuss how legislation and statutory and representative organisations affect a specified business in the environmental and land-based sector.
P2 identify the principal organisations and trade associations within an industry in the environmental and land-based sector [IE]		
P3 identify the main United Kingdom or European legislation and codes of practice relating to one industry within the environmental and land-based sector [IE]	**M2** explain the objectives and purpose of important current United Kingdom or European legislation for the environmental and land-based industry.	
P4 identify key requirements of current employment law on the environmental and land-based sector [IE]		

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	describe how common IT software can be used in everyday business operations	**M3**	explain the advantages and disadvantages of using IT for common business tasks	**D2**	discuss the importance of accuracy, security, confidentiality and data back up when completing business tasks.
P6	state the purpose and operation of common business tasks: ◊ financial and banking ◊ marketing ◊ administrative tasks				
P7	use appropriate methods to prepare, present, sort and retrieve information [CT]	**M4**	explain the purpose of specified administrative and accounting tasks.		
P8	carry out simple accounting and administrative tasks appropriate to the business. [SM]				

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 will have links to industrial experience placements.

In outcome 1 learners will study the structure of their industry. They will require the opportunity to investigate the range of businesses and their products/services, and also the ancillary businesses on which the primary businesses depend. They could relate these ideas to a specific business, while also investigating the range of businesses found locally and nationally. They will need access to any published data on the size and economic importance of their industry. Learners will also find out about the principal organisations and trade associations concerned with their industry, and will investigate the roles and impact of selected organisations. They will need support in investigating some of the key trends and issues facing their industry and how it is responding. Delivery of this outcome would be enriched by speakers from selected organisations.

Outcome 2 examines the UK and European legal framework affecting businesses in the particular land-based industry. Learners are not expected to become legal experts, but to develop an awareness of the main pieces of legislation and how they impact on business in their industry. They will need to investigate their legal rights and responsibilities as employees within the workplace.

In outcome 3 learners will identify how common IT software can be used to perform a range of everyday business operations. Some of these are common to all businesses (eg sending emails), but tutors should ensure that examples are vocationally relevant to the subject area of the learners. It is anticipated that delivery will include the opportunity for learners to develop their IT skills so that they gain a better understanding of the use of IT software. Learners will benefit from completing tasks using the range of software, and, by careful planning, these tasks could provide evidence for P7 and P8, for example use of word processor and graphics programmes to produce a marketing poster, a spreadsheet for stock inventory and valuation. Learners will need to find out about day-to-day business activities involving finance and banking. It would help learners to have the opportunity to study a range of records (financial and non-financial) that are kept in a specific business, and how these are maintained and used.

Outcome 4 links closely with outcome 3, and gives learners opportunity to practically engage in business operations and tasks. This should include preparing a range of business outputs using the IT applications listed, which could relate to other items in the content, eg advertisements, posters, specific records appropriate to businesses in their industry. It will be important for learners to have the opportunity to practise completion of paper-based records and ensure that both IT and paper records are filed appropriately. The importance of accuracy, confidentiality, security and regular back up of data should be stressed.

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: Industry Structure and Organisations (P1, P2, M1) Tutor introduces the assignment brief.
Classroom theory session and discussion: Structure of an industry in the environmental and land-based sector: activities and types of business, ancillary businesses, regional variations.
Theory session: size of the industry and economic data, development of the industry and current issues.
Classroom activity: use of industry magazines, publications and internet to identify principal organisations and trade associations.
Guest speaker: role of statutory and representative organisations.
Assessment completion and support.
Assignment 2: Legislation (P3, P4, M2, D1) Tutor introduces the assignment brief.
Theory session: UK and EU legislation and codes of practice relating to an environmental and land-based industry.
Classroom activity: importance of codes of practice.
Theory and supported research: Requirements of employment law.
Visit/guest speaker: how legislation and organisations affect a business in the sector.
Assessment completion and support.
Assignment 3: Business Tasks and Operations (P5, P6, P7, P8, M3, M4, D2) Tutor introduces the assignment brief.
Use of IT for common business tasks; application of word processor, email, spreadsheets, database and graphics software.
Financial and banking tasks – making and receiving payment, business bank accounts, ordering and invoicing.
Marketing – ways to advertise and promote a business, customer care and referral business.
Administrative – paper and electronic filing systems, stock check, business documents, simple business records, importance of confidentiality and security.
Assessment completion and support.
Unit review.

Assessment

For P1, learners need to describe the structure of one industry within the environmental and land-based sector. This must include the main activities and types of businesses that are found, including ancillary businesses, and regional variations. They should describe the size of the industry, making reference to any available data on employment and economic output. The evidence could be presented as a report or illustrated poster.

P2 requires learners to identify the principal organisations and trade associations within an industry in the environmental and land-based sector. Evidence should cover at least three different organisations, including one statutory, one non-governmental and one representative organisation. It should detail the name, contact details, aims and objectives of each organisation in relation to the land-based industry sector. Evidence could be a report, annotated poster, or verbal presentation.

For P3, learners need to identify the main United Kingdom or European legislation and codes of practice relating to one industry within the environmental and land-based sector. Evidence should include at least three important and relevant pieces of UK or EU legislation and/or codes of practice. It should provide the

full title and date, and briefly summarise the main requirements of the legislation in relation to the industry. Evidence may be a report or guidance booklet.

For P4, learners need to identify key requirements of current employment law on the environmental and land-based sector. Evidence should include at least two important and relevant pieces of UK and/or EU legislation. It should provide the full title and date, and briefly summarise the main requirements of the legislation in relation to the industry. Evidence may be a report or guidance booklet.

P5 requires learners to explain how common IT software can be used in everyday business operations. This must cover word processor, email, spreadsheet, database and graphics software. Evidence may be a verbal or written report, poster or leaflet.

For P6, learners must state the purpose and operation of common business tasks. For financial and banking this will include how businesses make and receive payments, order supplies and raise invoices. Marketing must include suitable ways to advertise and promote a business. Administrative tasks should include paper and electronic filing, simple records relevant to the industry sector, and stock control. Evidence may be in the same format as P5.

For P7 and P8, learners must carry out simple accounting and administrative tasks appropriate to the business and use appropriate methods to prepare, present, sort and retrieve information. Evidence must include all of the content listed; some of this could be IT generated.

For M1, learners need to extend work completed for P1 and P2 to explain the roles of principal organisations within one environmental and land-based industry. Evidence should include an explanation of the roles of at least three organisations (including at least one statutory and one non-governmental) presented in the same format as P1 or P2.

For M2, learners must explain the objectives and purpose of important current United Kingdom or European legislation for the land-based industry. Evidence should cover one piece of employment legislation and one other relevant piece of legislation. These could have been used for evidence towards P3 and P4 and presented in the same format.

For M3, learners are required to explain the advantages and disadvantages of using IT for common business tasks. Evidence could be a verbal or written report, poster or leaflet.

For M4, learners must explain the purpose of four of the tasks completed for P7 and P8. The tasks could be selected by the tutor, or agreed through discussion with the learner. Evidence could be in the same format as M3.

For D1, learners need to discuss the impact of legislation and statutory and representative organisations on the industry. Evidence should consider one piece of legislation and two organisations in detail, including positive or negative impacts and ways that the legislation and organisations affect working practices in the industry.

D2 requires learners to discuss the importance of accuracy, security, confidentiality and data back up when completing business tasks. Evidence should include legal as well as practical reasons, and describe ways in which accuracy can be checked and security and confidentiality ensured. Evidence may be in the same format as M3.

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 Edexcel assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1, P2, M1	Industry Structure and Organisations	You are taking part in marketing your industry sector to school leavers. You need to create a poster that gives an overview of your industry and the roles of the principal organisations and trade associations.	Poster
P3, P4, M2, D1	Legislation	You need to produce a fact sheet for someone starting a business in the industry that informs them of some basic legal requirements. Include the effect of the legislation on the business operations, and the impact of statutory and representative organisations on their working practices.	Fact sheet
P5, P6, P7, P8, M3, M4, D2	Business Tasks and Operations	You need to assist a business manager in performing a range of tasks, making use of IT. Create a guidance leaflet for the work experience student who is helping you which includes the purpose of the tasks, the advantages and disadvantages of using IT, and the importance of accuracy, security, confidentiality and data back up.	Portfolio of practical tasks and under-pinning knowledge, guidance leaflet

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
Undertake Work Related Experience in Land-based Industries	Business Management in the Land-based Sector

Essential resources

Learners will need to be able to access relevant information about their industry, through personal contacts, work experience or case study visits. They will also need access to IT, administrative and accounting records for completion.

Employer engagement and vocational contexts

This unit provides opportunity for learners to gain an overview of one industry within the environment and

land-based sector. They will also gain valuable experience in completing administrative and accounting tasks, including using IT. Learners would benefit from a range of guest speakers and industry visits.

Indicative reading for learners

Textbooks

Canwell D and Sutherland J – *BTEC First Business 2nd edition* (Nelson Thornes, 2006) ISBN 9780748783946

Carysforth C – *NVQ Level 2 Business and Administration* (Heinemann, 2006) ISBN 9780435463335

Carysforth C and Neild M – *BTEC First Business 2nd edition* (Heinemann, 2006) ISBN 9780435499075

Fardon, Nuttall and Prokopiw – *GCSE Applied Business* (Osborne Books, 2002) ISBN 9781872962320

Gookin D – *Word 2007 for Dummies* (John Wiley & Sons, 2006) ISBN 9780470036587

Seliet H – *BTEC Introduction to Business* (Heinemann, 2005) ISBN 9780435401214

Office 2007 for Dummies (John Wiley & Sons, 2006) ISBN 9780470009239

Websites

www.beta-uk.org	British Equestrian Trade Association
www.bhs.org.uk	British Horse Society
www.bized.co.uk	Business Studies Teaching Resources
www.businesslink.gov.uk	Business Link
www.cla.org.uk	Country Land and Business Association
www.defra.gov.uk	Department for Environment, Food and Rural Affairs
www.lantra.co.uk	Lantra Sector Skills Council
www.mlc.org.uk	Meat and Livestock Commission
www.netregs.gov.uk	Environmental regulations
www.nfuonline.com	National Farmers Union
www.ukagriculture.com	UK Agriculture
www.the-hta.org.uk	Horticultural Trades Association

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	investigating the structure of an industry in the land-based sector researching organisations researching legislation affecting the sector investigating business bank accounts
Creative thinkers	presenting information about an industry using IT software to perform business operations preparing and presenting information
Reflective learners	discussing the importance of customer care discussing the importance of customer care
Self-managers	carrying out accounting and administrative tasks.

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 …
Team workers	working with others to complete a stock check
Self-managers	completing assignment work to deadlines.

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 software to perform business operations
Use ICT to effectively plan work and evaluate the effectiveness of the ICT system they have used	
Manage information storage to enable efficient retrieval	filing electronic information
Follow and understand the need for safety and security practices	maintaining security and back-up copies of information
Troubleshoot	
ICT – Find and select information	
Select and use a variety of sources of information independently for a complex task	
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	preparing promotional material compiling a stock valuation preparing a database of business information
Bring together information to suit content and purpose	
Present information in ways that are fit for purpose and audience	writing a business letter
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	

Skill	When learners are …
Mathematics	
Understand routine and non-routine problems in a wide range of familiar and unfamiliar contexts and situations	preparing invoices
Identify the situation or problem and the mathematical methods needed to tackle it	
Select and apply a range of skills to find solutions	
Use appropriate checking procedures and evaluate their effectiveness at each stage	preparing business records
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	
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	researching legislation affecting the industry
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	completing assignments on the industry, trends and issues affecting it.

Unit 3: Introduction to Fish Health

Unit code: J/601/0445

Level 2: BTEC First

Credit value: 5

Guided learning hours: 30

Aim and purpose

This unit aims to introduce learners to the skills and knowledge needed for fish health and how these can be applied in practice. It is designed for learners in centre-based settings looking to progress into the sector or onto further/higher education.

Unit introduction

Understanding fish health is an essential requirement for anyone working in the fish industries such as fish farming (aquaculture), fisheries management and aquatics. Living in water creates many different challenges for fish. Understanding these challenges and how fish manage them should result in the resources being managed more efficiently, especially with regard to animal welfare issues.

Learners will explore common fish parasites, predators and the importance of good water quality and nutrition. They will cover topics such as the methods used to examine fish for signs of ill health, the common factors that cause ill health in fish and the steps that can be used to maintain fish health. Learners will also look at the methods commonly used to collect data about fish and the reasons for collecting it.

Learning outcomes

On completion of this unit a learner should:

1 Be able to perform the routine examination of fish and collect key data

2 Know how fish health can be maintained.

Unit content

1 Be able to perform the routine examination of fish and collect key data

Examination: visual examination of fish and identification of all external features; simple dissection techniques; health and safety; good laboratory practice; visual examination and identification of external features; observation of abnormalities – deformities, pathology, wounds, macro-parasites; record-keeping

Data collection: methods used to obtain data on length and weight of individual fish; methods used to remove, store and prepare scales; methods used to assess the age of a fish and its rate of growth

2 Know how fish health can be maintained

Fish health: signs of good health; symptoms caused by adverse water quality and poor nutrition; symptoms caused by pathogens; identification and life cycles of common external skin and gill parasites eg Whitespot, Trichodina, Dactylogyrus; identification and life cycles of common internal parasites eg eye fluke; symptoms, life cycles and methods of transmission of major viral and bacterial pathogens eg Koi Herpes Virus, furunculosis; identification of predators and the threat they pose – piscivorous fish, cormorants, otters, heron, mink

Prevention of ill health in fish populations: methods used to maintain and improve water quality; nutrition of fish; methods used to legally deter and control pests and predators; methods used to provide fish with refuge from predators; biosecurity measures; simple disease control methods; methods used to reduce stress in fish eg during handling and transportation

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	externally examine a specified fish and record data, including species, weight, length, gender and any abnormalities [IE, SM]	**M1**	carry out a simple dissection of a specified fish to meet given requirements, identifying the major internal organs	**D1**	assess the age and growth rate of fish using material gathered and an accepted method
P2	identify specified common fish parasites	**M2**	describe how water quality and nutrition can influence fish health.	**D2**	explain how preventative measures can reduce fish mortalities in a given situation.
P3	identify specified common fish predators.				

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

This unit is designed to provide underpinning knowledge of factors involved in keeping fish healthy. It is likely that delivery will revolve around lectures, discussions and seminars. Allowing learners to have some responsibility for keeping fish in, for example aquariums, will enable them to gain first-hand experience of observing fish health. Work experience placements can also play an important part in delivery of this unit: suitable witness statements can be used to gather evidence during work-related placements.

Delivery of learning outcomes 1 and 2 needs to be practical in nature and contextualised in relation to learners' fields of interest. In learning outcome 1, learners should be guided at first through lectures, seminars and demonstrations. Learners should have the opportunity to undertake simple dissections of fish. Health and safety and animal welfare issues must be addressed before learners undertake any dissections. The methods used to maintain fish health are covered in learning outcome 2. This is likely to be covered through lectures, discussions and seminars. However this area is likely to be touched on in every practical or work experience situation. It is important, therefore, to make these connections and contextualise this area for each learner. Field trips and visiting speakers can be especially important in highlighting the importance of fish health. For example, a fish farmer could talk about the management of fish health on their farm.

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 of planning the delivery and assessment of this unit.

Topic and suggested assignments/activities and/assessment
Introduction and overview of unit.
Fish examination and data-collection techniques. Practical and theory sessions.
Practical fish health.
Assignment 1: Fish Dissection (P1, P2, M1, D1) Introduce assignment.
Fish external and internal features.
Data collection.
Assignment 2: The Management of Fish Health (P3, M2, D2) Introduce assignment.
Fish health and prevention of ill health.
Unit evaluation.

Assessment

P1 requires learners to externally examine a specified fish and record data (including species, weight, length, gender and any abnormalities). Evidence is likely to be in the form of practical observation records and completed record sheet.

P2 and P3 require learners to identify specified common fish parasites and predators. Learners should identify fish parasites and predators that relate to their areas of interest. For example, a learner wishing

to enter the sport fishery management industry could identify parasites and predators commonly found in sport fisheries in the centre's locality or the learner's home region. Evidence could be gained through answers to questions posed directly or through a pictorial presentation.

For M1, learners must carry out a simple dissection of a specified fish to meet given requirements, identifying the major internal organs. Tutors should identify the objectives for the dissection within the assignment brief, which could be linked to other criteria within this unit. Evidence could be in the form of a laboratory report with an annotated diagram or photograph of the dissected fish.

For M2, learners must describe how water quality and nutrition can influence fish health. Learners could include within their evidence examples of situations that they have seen either during their previous work experience or during delivery of the programme. Evidence may be in the same format as for M2.

D1 requires learners to assess the age and rate of growth of a specified fish using an accepted method. It is best to use live fish to provide the scale sample, but tutors must ensure that animal welfare is maintained. Evidence will probably be a written report and should include information about other methods of ageing fish and how the collected data could be used.

D2 requires learners to explain how premature fish deaths can be prevented or reduced in a specified situation. Tutors should contextualise the situation to meet the primary learning aims of learners. Learners must give explanations that are realistic and comprehensive for the specified situation. Evidence could be in the form of a management plan for a specified situation.

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 Edexcel assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1, P2, M1, D1	Fish Dissection	Learners are each given a freshly dead fish. They must examine the fish and record all the necessary details. Once dissected, all the internal organs must be labelled correctly. Parasites must be identified during the examination. The lab report will include details of the functions of all the systems identified. Scales can be collected and analysed.	Practical observation and assessment Written or verbal report
P3, M2, D2	The Management of Fish Health	For a given situation, eg fish farm, describe how mortalities may be reduced by the correct management of nutrition and water quality. Identify possible predators and measures that can be used to reduce their impact.	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 Environmental and Land-based sector suite. This unit has particular links with the following unit titles in the Environmental and Land-based suite:

Level 2	Level 3
Introduction to Fish Biology	Understanding Fish Biology and Behaviour
Introduction to Caring for Ornamental Aquatics	Understanding Fish Health and Welfare

Essential resources

Learners must have access to a laboratory which has equipment suitable for dissecting, internally examining, weighing, measuring and ageing fish. A supply of fresh or frozen fish will be necessary for identification purposes and anatomical investigations.

Tutors must be competent and experienced in examining, handling and diagnosing ill health in fish.

Indicative reading for learners

Textbooks

Andrews C, Exell A and Carrington N – *The Interpet Manual of Fish Health* (Interpet Publishing, 2002) ISBN 978-1842860670

Greenhalgh M and Ovenden D – *Collins Pocket Guide: Freshwater Life* (Collins, 2007) ISBN 978-0007177776

Harding P (editor) – *Freshwater Fishes in Britain: Their Species and Distribution* (Harley Books, 2004) ISBN 978-0946589760

Hoole D, Bucke D, Burgess P and Wellby I – *Diseases of Carp and other Cyprinid Fish* (Wiley-Blackwell, 2001) ISBN 978-0852382523

Journals

Anglers Mail

Angling Times

Salmon and Trout

Websites

www.defra.gov.uk	Department for Environment, Food and Rural Affairs
www.efishbusiness.co.uk	A multi agency government site for aquaculture
www.environment-agency.gov.uk	Environment Agency
www.ifm.org.uk	Institute of Fisheries Management
www.ornamentalfish.org	site for aquatic hobbyists and the aquatic industry
www.salmon-trout.org	The Salmon & Trout Association

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	using various information gathered to correctly identify species of fish recording and using information gathered correctly to examine a fish
Reflective learners	using a variety of information sources to identify species of fish correctly
Self-managers	managing time and resources to proceed with data collection within a given time frame.

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 the life histories of fish identifying different fish predators and their possible effects in different situations
Creative thinkers	using information from various sources to develop possible anti-predator devices or management practices
Reflective learners	analysing how a fish might perceive its environment using its sensory systems
Team workers	participating in practice laboratory sessions in small groups
Effective participators	discussing the use of preventative measures to ensure good fish health in different situations.

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	producing a poster on the life histories of selected fish species
ICT – Find and select information	
Select and use a variety of sources of information independently for a complex task	researching the identification of various fish species using a variety of resources
Access, search for, select and use ICT-based information and evaluate its fitness for purpose	finding suitable pictures and diagrams to highlight the external features of fish and their life histories
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 on the dissection of fish and displaying the information gathered during the dissection
Bring together information to suit content and purpose	
Present information in ways that are fit for purpose and audience	producing a poster, or other material to highlight the life history and reproductive biology of selected fish species
Mathematics	
Select and apply a range of skills to find solutions	identifying fish using a range of key features identifying fish parasites using a range of key features
English	
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	completing a written summary of the data collected during a fish examination and dissection
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	completing a written report describing measures that could be used to reduce fish mortalities.

Unit 4: Introduction to Fish Biology

Unit code: K/601/0437

Level 2: BTEC First

Credit value: 5

Guided learning hours: 30

Aim and purpose

This unit aims to introduce learners to the skills and knowledge needed for fish biology and how these can be applied in practice. It is designed for learners in centre-based settings looking to progress into the sector or onto further/higher education.

Unit introduction

Fish biology is an essential requirement for anyone working in the fish industries such as fish farming (aquaculture), fisheries management and aquatics.

Learners will explore fish identification techniques and consider simple fish physiology and biology. They will develop the skills needed to carry out routine examination and recording of fish and learn about common fish parasites, predators and the importance of good water quality and nutrition.

This unit involves studying basic fish anatomy and physiology. It covers the basic external and internal anatomy and physiology of fish, general behavioural responses and the use of keys to identify fish from their external structures.

Learning outcomes

On completion of this unit a learner should:

1 Know freshwater fish identification

2 Understand elementary fish biology.

Unit content

1 Know freshwater fish identification

External body features: name, location and function of mouthparts, eyes, nostrils, lateral line canal and urino-genital pore; name, location and function of all single and paired fins; name, type, location and function of scales

Identification: use of keys; familiarity with keys used to identify common fish species from their external characteristics; common areas of confusion, hybrid fish, similar fish species, family linkages; differences in identification characteristics depending on life stage of fish; common names and scientific names

2 Understand elementary fish biology

Body systems: name, location and function of all sensory systems – sight, smell, taste, touch, sound, pressure waves, electrical reception; name, location and function of skeleton, swimbladder, respiratory, circulatory, reproductive, digestive and excretory systems; major differences between different diet types – herbivore, piscivore, omnivore; osmoregulation within fish

Behaviour: reproductive biology of fish – maturation, courtship, spawning, egg incubation, fry and juvenile stages; diurnal behaviour patterns; behavioural responses to food, ill health, environmental changes and the presence of predators

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	recognise the external body features of specified coarse and game fish	**M1**	describe the function of external body features		
P2	identify specified game and coarse fish [RL, IE]				
P3	explain the position and function of the sensory, skeletal, respiratory, circulatory, digestive, excretory and reproductive systems in a specified fish species.	**M2**	explain in detail the function of the sensory, skeletal, respiratory, circulatory, digestive, excretory and reproductive systems in a specified fish species.	**D1**	compare the reproductive biology and early life history of a specified game fish and a specified coarse fish.

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

This unit is designed to provide underpinning knowledge of fish biology and factors involved in keeping fish healthy. It is likely that much of the first part of the delivery will revolve around lectures, discussions and seminars. Learners can use the angling press to find out about unusual species and discuss the identification of some possible hybrid fish. Allowing learners to have some responsibility for keeping fish in, for example aquariums, will enable them to gain first-hand experience of water quality and nutritional factors, as well as observing behavioural patterns in the fish.

It is likely that learning outcomes 1 and 2 will be covered first, generally being delivered using formal lectures, discussions and seminars. Independent learner research can also play an important role. Learners should be made aware of the principle external features of a fish and how these are used in the identification of particular species. Learners should also look at how keys work in the identification of biological specimens. Learners can then go on to look at the more closely related species and the difficulties surrounding hybrid fish. These issues can be highlighted using the many examples of fish that are submitted to the British Record Fish Committee. Identifying fish from photographs in the angling press can be an interesting way of reinforcing the importance of accurate identification. Linking the areas covered in learning outcome 1 is straightforward. Again it would be expected that formal lectures, discussions and seminars would play a part in delivery, however there is a good opportunity for learners to carry out a variety of supervised laboratory practicals in this area. Learners should be able to observe or have access to freshly deceased or preserved fish. If this is not possible, then access to high-quality visual or audio-visual materials is essential.

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 of planning the delivery and assessment of this unit.

Topic and suggested assignments/activities and/assessment
Introduction and overview of unit.
Freshwater fish identification. Practical and theory sessions.
Elementary fish biology.
Assignment 1: Fish Identification (P1, P2, M1) Tutor introduces assignment.
External body features.
Identification of fish – practical and theory sessions.
Assignment 2: Fish Dissection (P3, M2) Tutor introduces assignment.
Fish body systems.
Exploration of fish behaviour – practical and theory sessions.
Assignment 3: Life Histories (D1) Tutor introduces assignment.
Reproduction and life history.
Unit evaluation.

Assessment

For P1, learners will be expected to recognise the external body features of specified game and coarse fish. It is highly likely that evidence will be linked to that for other criteria within the unit. Evidence could be in the form of a laboratory report or, possibly, assessed directly through observation. Alternatively, learners could produce answers to questions posed directly or through a pictorial presentation. P2 requires the identification of specified game and coarse fish and evidence could be gathered in the same manner as for P1. It is likely that these two criteria would be assessed together. Learners must identify a minimum of 10 species.

P3 requires learners to explain the position of the sensory, skeletal, respiratory, circulatory, digestive, excretory and reproductive systems in a specified fish species. Learners, with tutor guidance, should identify a fish species that relates to a relevant area for learners, for example a learner wishing to enter the fisheries industry may produce evidence relating to a common carp or tench. Evidence could be in the form of a written report or, possibly, a poster, leaflet or web page.

For M1, learners will be expected to describe the function of the external body features of specified game and coarse fish. This is likely to be linked to P1 and use the same fish as examples. Evidence could be in the form of a written report or possibly a poster, leaflet or web page.

For M2, learners are expected to explain in detail the function of the sensory, skeletal, respiratory, circulatory, digestive, excretory and reproductive systems in a specified fish species. This will be an enhancement to P3. Evidence could be in the form of a report or possibly a poster, leaflet or web page.

For D1, learners must compare the reproductive biology and early life stages of a specified game-fish species and a specified coarse fish species. Tutors can either choose the specified species themselves or in discussion with learners. Learners could produce evidence in the form of a pictorial presentation with notes, an annotated poster, leaflet or web page.

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 Edexcel assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1, P2, M1	Fish Identification	A collection of 10 different species is presented to learners. These should be identified correctly and for one species all the external features should be identified. The report (verbal or written) should include details of the function of these body features.	Practical observation and assessment. Written or verbal report.
P3, M2	Fish Dissection	Learners are each given a freshly dead fish. They must examine the fish and record all the necessary details. Once dissected, all the internal organs must be labelled correctly. Parasites must be identified during the examination. The lab report will include details of the functions of all the systems identified. Scales can be collected and analysed.	Practical observation and assessment. Written or verbal report.
D1	Life Histories	For selected fish, produce a poster detailing their life history and reproductive biology.	

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

This unit forms part of the BTEC Environmental and Land-based sector suite. This unit has particular links with the following unit titles in the Environmental and Land-based suite:

Level 2	Level 3
Introduction to Fish Health	Understanding Fish Biology and Behaviour
Introduction to Caring for Ornamental Aquatics	Understanding Fish Health and Welfare

Essential resources

Learners must have access to a laboratory which has equipment suitable for dissecting, internally examining, weighing, measuring and ageing fish. A supply of fresh or frozen fish will be necessary for identification purposes and anatomical investigations.

Tutors must be competent and experienced in examining, handling and diagnosing ill health in fish.

Employer engagement and vocational contexts

This unit focuses on the underlying learning required to understand fish biology. It then goes on to cover practical issues of fish identification. Learners will develop the skills necessary for the routine examination and recording of fish and learn about common parasites, predators and the importance of good water quality and nutrition. Learners should be encouraged to practise these skills during work-experience placements. Guest lectures and off-site visits should also be used to highlight how these skills are important within the industry.

Indicative reading for learners

Textbooks

Bone Q and Moore R – *Biology of Fishes* (Taylor & Francis, 2007) ISBN 978-0415375627

Greenhalgh M and Ovenden D – *Collins Pocket Guide: Freshwater Life* (Collins, 2007) ISBN 978-0007177776

Harding P (editor) – *Freshwater Fishes in Britain: Their Species and Distribution* (Harley Books, 2004) ISBN 978-0946589760

Journals

Anglers Mail

Angling Times

Salmon and Trout

Websites

www.defra.gov.uk	Department for Environment, Food and Rural Affairs
www.environment-agency.gov.uk	Environment Agency
www.efishbusiness.co.uk	A multi agency government site for aquaculture
www.ifm.org.uk	Institute of Fisheries Management
www.ornamentalfish.org	site for aquatic hobbyists and the aquatic industry
www.salmon-trout.org	The Salmon & Trout Association

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	using various information gathered to correctly identify species of fish recording and information gathered correctly to examine a fish
Reflective learners	using a variety of information gathered to identify species of fish correctly
Self-managers	managing time and resources to proceed with data-collection within a given time frame.

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 the life histories of fish identifying different fish predators and their possible effects in different situations
Creative thinkers	using information from various sources to develop possible anti-predator devices or management practices
Reflective learners	analysing how a fish might perceive its environment using its sensory systems
Team workers	participating in practice laboratory sessions in small groups
Effective participators	discussing the use of preventative measures to ensure good fish health in different situations.

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	producing a poster on the life histories of selected fish species
ICT – Find and select information	
Select and use a variety of sources of information independently for a complex task	researching the identification of various fish species using a variety of resources
Access, search for, select and use ICT-based information and evaluate its fitness for purpose	finding suitable pictures and diagrams to highlight the external features of fish and their life histories
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 on the dissection of fish and displaying the information gathered during the dissection
Bring together information to suit content and purpose	
Present information in ways that are fit for purpose and audience	producing a poster, or other material to highlight the life history and reproductive biology of selected fish species
Mathematics	
Select and apply a range of skills to find solutions	identifying fish using a range of key features identifying fish parasites using a range of key features
English	
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	completing a written summary of the data collected during a fish examination and dissection
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	completing a written report into the measures that can be used to reduce fish mortalities.

Unit 5: Introduction to Aquatic Ecology

Unit code: R/600/9217

Level 2: BTEC First

Credit value: 10

Guided learning hours: 60

Aim and purpose

This unit aims to introduce learners to aquatic ecology skills and knowledge and how these can be applied in practice. It is designed for learners in centre-based settings looking to progress into the sector or onto further/higher education.

The learner will explore the water and its composition as well as natural factors that influence water quality. They will learn how to identify aquatic species and the links between habitats and aquatic animals. They will also learn the skills needed to assess the status of freshwater aquatic environments.

Unit introduction

An understanding of water and the aquatic environment is essential to people working within many of the land-based industries. Freshwater habitats contain many unusual plants and creatures, together with complex interactions involved in maintaining a balanced and healthy aquatic environment. This may be obvious to industries directly involved in the management of aquatic resources such as fisheries management, aquaculture and aquatics. However, many other industries engaged in countryside management, for example agriculture, horticulture, animal care, are often also involved in the management of aquatic resources. There should be some awareness of how their activities may impact on important freshwater habitats.

The first part of the unit looks at the principal characteristics of water, in particular its unusual physical and chemical characteristics. Learners will also cover the water (hydrological) cycle and the major influences affecting the type of habitat that water provides in a particular environment.

The unit investigates the plants and animals that learners can expect to find in the aquatic environment. Learners will investigate the external features and functions of these plants and animals that enable them to thrive in certain habitats. These investigations will help learners to identify these plants and animals correctly.

The final part of the unit covers the basic methods of assessing the status of aquatic environments by looking at methods of collecting and analysing samples of water and invertebrates. Learners will also look at human influences on water resources, in particular water pollution.

The aquatic environment can be dangerous to work in. Safe working practices, health and safety policies and the use of Personal Protective Equipment are stressed throughout this unit in order to allow learners to develop a safe, confident and adaptable approach to working in this environment.

Learning outcomes

On completion of this unit a learner should:

1 Know the principal characteristics of water

2 Know common freshwater aquatic biota

3 Know the influences of habitat characteristics on aquatic life

4 Be able to assess the status of freshwater aquatic environments.

Unit content

1 Know the principal characteristics of water

Chemical characteristics: chemical composition of water; hydrogen bonds; specific heat capacity; water as a solvent; cohesive properties; variations in the chemical composition of water eg suspended solids, turbidity, biochemical oxygen demand (BOD), dissolved oxygen, pH and hardness; sources of plant nutrients (nitrates, phosphates); major chemical differences between freshwater, brackish water and salt water; sources and uses of water eg abstraction for potable drinking water supplies

Physical characteristics: the hydrological cycle; rates of flow, currents and tides; influence of geology and land use; water temperature and its variation; reasons for and the effects of diurnal changes in dissolved oxygen and pH; pressure and temperature variation with depth

2 Know common freshwater aquatic biota

Plants: the major groups of plants; submerged, floating-leafed, floating, marginal and riparian macrophytes and algae; general characteristics of plants eg the form and function of leaves, buds, stems, flowers and roots; life cycles of given species; methods used to identify plants eg identification keys.

Animals: the major groups of aquatic animals; major external characteristics of aquatic invertebrates and vertebrates; the form and function of major external and internal body structures of aquatic invertebrates and vertebrates; the methods of respiration and feeding; lifecycles of given species of aquatic invertebrates and vertebrates; methods used to identify aquatic animals eg identification keys

3 Know the influences of habitat characteristics on aquatic life

Significance of aquatic conditions: the major aquatic habitat types; the influence of abiotic factors eg substrate type, water temperature, pH, flow, depth, siltation, altitudeon aquatic biota

Adaptations to meet habitat conditions: aquatic flora and fauna adaptations to their habitats eg body shape, respiration methods, feeding; ability and methods used to colonise new habitats

4 Be able to assess the status of freshwater aquatic environments

Sampling: the use of equipment to measure flow, turbidity and depth; methods and equipment used to collect, store and analyse water and invertebrate samples from stillwater and running water habitats; methods and equipment used to test dissolved oxygen, temperature and pH; safe working practices; health and safety; personal protective equipment (PPE)

Data interpretation: simple data analysis methods eg classification of habitat quality depending on water quality results or invertebrate sampling results; assessment of status eg polluted, clean, nutrient-rich, nutrient-poor

Water pollution: types of organic and inorganic pollutants; the principal origins of point-source and diffuse pollutants; the methods used to detect and prevent water contamination; relevant current legislation eg Environment Act 1995; role of the Environment Agency

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 major physical characteristics of water				
P2	describe the major chemical characteristics of water	**M1**	outline key natural factors that influence the different types of aquatic habitat	**D1**	explain the causes of the diurnal variations in dissolved oxygen and the effect of these changes
P3	identify aquatic plants, invertebrates and vertebrates from a given site [SM, IE]	**M2**	describe the function of the external features of a specified aquatic plant, aquatic invertebrate and aquatic vertebrate	**D2**	describe the life cycle of a specified aquatic invertebrate and a specified aquatic vertebrate
P4	describe how habitat characteristics in a specified site are influenced by abiotic factor	**M3**	identify habitat types that are suitable for a specified aquatic plant, aquatic invertebrate and aquatic vertebrate		
P5	collect water samples from a given freshwater habitat [TW, EP]	**M4**	compare the variety of equipment available to analyse water quality samples.	**D3**	assess the status of a freshwater habitat from water and aquatic invertebrate samples.
P6	collect invertebrate samples from a given freshwater habitat. [TW, EP]				

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

This unit is designed to provide underpinning knowledge related to water and the aquatic environment. As such, it is likely that most of the initial delivery will revolve around lectures, seminars and discussions. However, there is an opportunity for learners to investigate much of the underpinning knowledge, particularly on the properties of water, in laboratory and field practicals. It would be beneficial if learners and supervisors are 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 collect and analyse water samples from a site and to assess its status.

There are several opportunities for learners to complete this unit during field practicals. Health and safety issues relating to working with water must be stressed and reinforced regularly and risk assessments must be undertaken before any practical activities.

It is likely that learning outcomes 1 and 2 will be covered first and are likely to be delivered through laboratory practicals, formal lectures, discussions and independent learner research. Learners should be made aware of the principal characteristics of water, including brackish water and salt water as well as fresh waters. It is vital that learners use practical activities to reinforce their understanding of the characteristics of water. While researching aquatic biota learners should be able to observe or have access to living or preserved examples of aquatic plants, invertebrates and vertebrates. Delivery must include the use of current and relevant identification keys. Visiting expert speakers could add to the relevance of the subject for learners. For example, a freshwater ecologist could talk about their work, the identification methods they use and the importance of correct identification.

In learning outcomes 3 and 4 the emphasis is more on using the information gained in learning outcomes 1 and 2 to gain greater understanding of aquatic habitats and how to investigate them. Learners could start by looking at how the characteristics of a habitat influence aquatic life, and the way that organisms adapt to meet these. This underpinning knowledge is important when learners are investigating the impacts pollution may have on aquatic habitats. Learning outcome 4 is then relevant in demonstrating how aquatic environments can be analysed. It is likely to be delivered largely through supervised laboratory and field practical sessions. Health and safety issues must be addressed before learners undertake any water or invertebrate sampling in the field. Adequate PPE must be provided and used following the production of suitable risk assessments. Learners can analyse samples either in the laboratory or in the field as conditions dictate. The water test kits and portable testing instruments used should be of a type that learners will find in industry. Visiting expert speakers could add a great deal to the relevance of this subject for learners. For example, a freshwater ecologist or a water resources officer could talk about their work, the methods they use and specific examples of where these methods have been used.

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 and overview of unit.
Water – physical and chemical properties. Practical and theory sessions.
Habitats and their key natural factors.

Topic and suggested assignments/activities and/assessment
Assignment 1: The Nature of Water (P1, P2, M1, D1)
Tutor introduces assignment.
Fluctuations in chemical properties (DO, pH, etc).
Identification of plants – practical and theory sessions.
Identification of invertebrates – practical and theory sessions.
Identification of vertebrates – practical and theory sessions.
Assignment 2: Aquatic Plants, Invertebrates and Vertebrates (P3, M2, D2)
Tutor introduces assignment.
Identify habitat types and the abiotic factors – theory.
Identify habitat types that are suitable to different animals – theory.
Field trip to visit a variety of habitat types.
Water sample collection – practical.
Invertebrate sample collection – practical.
Research various equipment available to analyse water quality – theory and discussion.
Water sample analysis – practical.
Invertebrate sample analysis – practical.
Assignment 3: Water Survey (P5, P6, M4, D3)
Tutor introduces assignment.
Assessing the status of water bodies from various collected information.
Assignment 4: Habitat Characteristics (P4, M3)
Introduce the assignment brief.
Individual support.
Personal study.
Unit review.

Assessment

For P1 and P2, learners will need to describe the physical and chemical characteristics of water. Evidence for this could be gathered during a supervised laboratory session with a written report on characteristics not covered in the laboratory session. Alternatively, learners could produce an annotated poster, leaflet or web page. Short-answer questions could also be a useful method of assessment.

P3 requires learners to identify plants, invertebrates and vertebrates from a given site. Evidence for this could take the form of a site practical and laboratory session with a written report, although some areas could be assessed directly by the tutor during the practical activities.

For P4, learners are required to describe how habitat characteristics in a specified site are influenced by abiotic factors. Tutors should agree the site in discussion with learners, depending on learners' particular interests. Where possible, the size and complexity of the site should be the same for each learner. Evidence for this could take the form of a pictorial presentation, an annotated poster or leaflet, a web page or a written project.

P5 and P6 require learners to collect water and invertebrate samples from a given freshwater habitat. The water samples should be collected using an industry-recognised method. The invertebrate samples should be collected using a method recognised for the type of environment being studied. In order to ensure safe working practices, samples should be collected in pairs or by small teams, not individually. It is highly likely

that evidence will be linked directly to the evidence for P3. Evidence for this could, therefore, take the form of a site practical and laboratory session with a written report, although some areas could be assessed directly by the tutor during the practical activities.

For M1, learners are required to outline the key natural factors that influence the different types of freshwater habitat. Learners may, if they wish, identify an individual catchment familiar to them to illustrate the factors they have identified. Evidence for this could take the form of a pictorial presentation, an annotated poster, a leaflet, web page or written report.

For M2, learners are required to describe the function of the external features of a specified aquatic plant, a specified aquatic invertebrate and a specified aquatic vertebrate. Tutors should agree these in discussion with learners. Where possible, the size and complexity of the organisms identified should be the same for each learner. Assessment could easily be linked to that for P3 and therefore evidence may be in the same format.

M3 requires learners to identify habitat types that are suitable for a specified aquatic plant, a specified aquatic invertebrate and a specified aquatic vertebrate. It is suggested that tutors select a small range of these different groups (either as specimens or in a high-quality pictorial presentation) and present them to learners. Learners can then answer short questions or write a report on each example.

Sampling, particularly for water quality analysis, can be difficult, as there is such a range of equipment available. M4, therefore, requires learners to compare various pieces of equipment available for the analysis of water quality samples. This should, as a minimum, include equipment for the analysis of dissolved oxygen, temperature and pH. Learners should identify the advantages and disadvantages of each. Evidence could be as a written report, leaflet or consumer report.

D1 requires learners to explain the cause and effect of diurnal variations in dissolved oxygen content. Evidence may be gathered as a practical data-gathering exercise along with a written report.

For D2, learners are required to describe the life cycle of a specific aquatic invertebrate and aquatic vertebrate. Learners may use species that have been studied for other learning outcomes in this unit. Alternatively, tutors may agree the organisms in discussion with learners to reflect learners' particular interests. Evidence for this could take the form of a pictorial presentation, an annotated poster, a leaflet, web page or written report.

D3 requires learners to assess the status of a freshwater habitat from water and aquatic invertebrate samples. This should be to industry standards and appropriate for the type of environment being studied. This assessment could use the data gathered within this unit or, alternatively, for a new environment. It is important that the assessment is complete and includes all areas of the chosen habitat. Evidence for this could take the form of a pictorial presentation, an annotated poster, leaflet, web page or written report.

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 Edexcel assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1, P2, M1 and D1	The Nature of Water	Learners are asked to demonstrate the meniscus on water and capillary action. A written report is required describing the other chemical and physical characteristics of water. Using this information learners need to describe how these factors influence the different habitats. Using provided data, learners complete and explain a graph of the oxygen levels of a water body.	Laboratory practical and written report.
P3, M2 and D2	Aquatic Plants, Invertebrates and Vertebrates	A selection of plants, invertebrates and animals are provided. Learners must identify the specimens and then identify the main external features and their function. For specified examples, learners must describe the life cycle.	Practical and written report
P5, P6, M4 and D3	Water Survey	Visit a suitable freshwater habitat and collect water and invertebrate samples. Use suitable methods and equipment to analyse the samples. Compare the equipment used with other equipment available. Use the results gained to assess the status of the freshwater habitat.	
P4 and M3	Habitat Characteristics	Describe how habitat characteristics in a specified site are influenced by abiotic factors. Examples of various plants, invertebrates and vertebrates are given and learners must identify which habitats each are best suited to and the reasons why.	

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

This unit forms part of the BTEC Environmental and Land-based sector suite. This unit has particular links with the following units in the Environmental and Land-based suite:

Level 2	Level 3
Introduction to Fish Health	Warmwater and Marine Aquaculture
Introduction to Fish Biology	Understanding Aquatic Plant Biology and Husbandry
Introduction to Caring for Ornamental Aquatics	Understanding Freshwater Aquarium Systems
	Understanding Marine Aquarium Systems

Essential resources

Learners will require access to a number of different aquatic environments and a range of equipment, for example colorimetric testing kits for water sampling, portable electronic testing equipment, secchi discs, water flow and depth measuring equipment and invertebrate sampling equipment. Laboratory equipment will be required to carry out the basic examination of aquatic flora and fauna. A range of keys suitable for the identification of plants, invertebrates and vertebrates must be available.

A range of Personal Protective Equipment must also be available for working in laboratory conditions, for examining and collecting samples at the waterside and for entering the water to collect samples. First-aid

kits and handwashing facilities must be provided.

Tutors must be competent and experienced in the assessment of water quality and aquatic environments.

Employer engagement and vocational contexts

This unit focuses on the underlying learning required to understand aquatic ecology. It then covers practical issues of species identification. Learners will develop the skills needed to carry out routine sampling and assessment of a variety of aquatic habitats. Learners should be encouraged to practise these skills during any work experience placements. It is very important that guest lectures and off site-visits are used to highlight how these skills are used within the industry.

Indicative reading for learners

Textbooks

Barnes R S K and Mann K H – *Fundamentals of Aquatic Ecology* (Wiley-Blackwell, 1991) ISBN 978-0632029839

Croft P – *Key to the Major Groups of British Freshwater Invertebrates* (Field Studies Council, 1986) ISBN 978-1851531813

Greenhalgh M and Ovenden D – *Collins Pocket Guide: Freshwater Life* (Collins, 2007) ISBN 978-0007177776

Harding P (editor) – *Freshwater Fishes in Britain: Their Species and Distribution* (Harley Books, 2004) ISBN 978-0946589760

Maitland P – *The Biology of Freshwaters* (Kluwer Academic Publishers, 1994) ISBN 978-0751402797

Olsen L H, Sunesen J and Pedersen B V – *Small Freshwater Creatures* (Oxford Press, 2001) ISBN 978-0198507987

Preston C D and Croft J M – *Aquatic Plants in Britain and Ireland* (Harley Books, 2001) ISBN 978-0946589692

Websites

www.btcv.org.uk	International volunteering organisation
www.defra.gov.uk	Department for Environment, Food and Rural Affairs
www.environment-agency.gov.uk	Environment Agency
www.freshwaterlife.org	The purpose of FreshwaterLife is to promote easy access to the world's information of freshwater organisms and their habitats.
www.ifm.org.uk	Institute of Fisheries Management
www.lifeinfreshwater.org.uk	Field Studies Council

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	using various information to identify plants, invertebrates and vertebrates
Team workers	collaborating with others to collect water samples safely collaborating with others to collect invertebrate samples safely
Self-managers	managing time and resources to effectively identify a range of plants, invertebrates and vertebrates within a given time
Effective participators	participating with others to collect invertebrate samples safely.

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 the natural factors that influence different types of habitat researching the function of external features
Creative thinkers	explaining the diurnal changes in dissolved oxygen assessing the status of freshwater habitats from water and aquatic invertebrate samples
Reflective learners	reviewing the variety of equipment used for analysis of water quality samples
Effective participators	participating in discussions identifying suitable habitats for various aquatic species.

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 life cycles of specified invertebrates and invertebrates
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 information on water quality sampling results presenting information on invertebrate sampling results
Bring together information to suit content and purpose	comparing the variety of equipment available for analysis of water quality samples
Present information in ways that are fit for purpose and audience	assessing the status of freshwater habitats using results from various sources
Mathematics	
Select and apply a range of skills to find solutions	identifying aquatic plants, invertebrates and vertebrates using various resources
English	
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	outlining the key natural factors that influence the different types of aquatic habitat
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	explaining the causes of the diurnal fluctuations in dissolved oxygen and the effects these may have.

Unit 6: Participate in Providing Estate Maintenance

Unit code: Y/600/9364

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 estate skills 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

Developing skills in estate maintenance is fundamental for learners studying any land-based qualification. Workers in many different jobs need to be able to carry out construction, maintenance and repair work on a variety of structures and surfaces. This unit develops these practical skills, together with the required underpinning knowledge.

This unit aims to develop practical skills in the use of hand tools and equipment, together with those required to maintain boundaries and surfaces or habitats in the context of the industry sector being studied by the learner. Learners will work both independently and in group situations to refine their individual skills and abilities.

Throughout this unit learners will be made aware of the health and safety implications of the work they are carrying out and its possible impact on the environment. They will learn the importance of risk assessment, keeping themselves and those around them safe and using personal protective equipment. They will also gain an overview of environmental and health and safety legislation and the consequences of not adhering to these.

On the achievement of this unit, learners will be able to complete a variety of basic maintenance and repair tasks, demonstrating awareness of health and safety and working with due regard to the environment around them. This unit will prepare the learner for work in a variety of vocational jobs within the land-based sector and will provide a sound foundation for further study at a higher level.

Learning outcomes

On completion of this unit a learner should:

1 Be able to select, transport and use a range of hand tools and equipment for estate maintenance

2 Be able to maintain estate boundaries

3 Be able to maintain surfaces or habitats

4 Know how to work safely and minimise environmental damage.

Unit content

1 Be able to select, transport and use a range of hand tools and equipment for estate maintenance

Selection of hand tools and equipment: for maintenance tasks eg hammer, spanner, saw, spade, shovel, yard brush, fork, rake, loppers, secateurs, shears, pickaxe, wire cutters, wire strainers, trowel, mallet, half moon edging iron, bolster chisel, paint brush, wheelbarrow, string line, tape measure, ladder, spirit level, fence post driver

Tool and equipment use: safe methods of use, checks and maintenance, safe manual handling, tool and equipment transportation, safe storage

Safety: current legislation eg Health and Safety at Work Act 1974, safe working practices including manual handling techniques and working distances; personal protective equipment (PPE), risk assessment

2 Be able to maintain estate boundaries

Boundaries: relevant to the land-based sector being studied eg hedgerows, walls (eg retaining, free standing, dry-stone), ditches, canal/river banks, fencing (eg post and rail, chestnut paling, chain link, post and wire, electric, panel, closeboard, temporary, security, picket, rabbit, deer, hurdle, trellis)

Maintenance and repairs: pre maintenance checks, relevant safe routine maintenance and repair techniques using correct tools and equipment (eg trimming hedges, clearing ditches, restoring banks, repairs to walls and fences), safe working practices, correct disposal of waste, personal protective equipment (PPE), risk assessment

3 Be able to maintain surfaces or habitats

Surfaces: relevant to the land-based sector being studied eg woodchip, concrete, gravel, soil, stone, grass, paving eg block, slab; sand, rubber, bitumen, decking, resin, temporary

Habitats: relevant to the land-based sector being studied eg woodland, scrub, grassland, marsh, salt marsh, sand dune, fen, heathland, mire, bog, flush, swamp, standing water, running water, arable land

Maintenance or repairs: pre maintenance checks, relevant safe maintenance and repair techniques using correct tools and equipment (eg adding surface, applying a surface treatment, clearing or restoring a habitat), safe working practices, correct disposal of waste, personal protective equipment (PPE), risk assessment

4 Know how to work safely and minimise environmental damage

Health and safety legislation: relevant current legislation eg Health and Safety at Work Act 1974, Reporting of Incidents, Control of Substances Hazardous to Health (COSHH) 2002, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR); reasons for legislation, accident reporting, consequences of accidents at work, personal protective equipment (PPE), risk assessments, safe manual handling techniques

Environmental legislation and codes of practice: relevant current legislation and codes of practice eg Environment Act 1995, Environmental Damage and Liability Regulations 2009, Waste Management (England and Wales) Regulations 2006; reasons for legislation and codes of practice; role of relevant authorities eg Environment Agency, local authorities

Problems presented by services: risk of damage to pipes (eg water, gas, sewage), cables (eg telephone, electricity); location of pipes and cables; methods to locate pipes and cables; disconnection of services; planning work to avoid pipes and cables; lack of services for work completion (eg water, telephone, electricity)

Environmental damage: pollution (to water courses, through litter or debris, noise); damage to habitats; wastage of resources; ways of minimising damage

Waste disposal: safe disposal of organic waste, eg recycling, composting, chipping, burning; safe disposal of inorganic waste eg recycling, discarding safely, landfill

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 appropriate tools and equipment for specific estate maintenance tasks [SM]	**M1** explain the importance of correct tool selection, transport, usage and maintenance	**D1** discuss the purpose of practical work completed, suggesting further maintenance work required
P2 lift tools and equipment safely using appropriate techniques [TW, SM]		
P3 transport and use tools and equipment safely [TW, SM]		
P4 maintain and store tools and equipment according to instructions [TW, SM]		
P5 assess the condition of boundaries to determine maintenance requirements [CT]	**M2** plan and carry out the maintenance and repair tasks to agreed timescales and specification	
P6 carry out routine maintenance of boundaries safely [TW, SM]		
P7 carry out routine repairs of boundaries safely [TW, SM]		
P8 dispose of waste materials in line with instructions [TW]		
P9 assess the condition of surfaces or habitats to determine the maintenance requirement [CT]	**M3** plan and carry out the maintenance or repair tasks to agreed timescales and specification	
P10 carry out appropriate maintenance or repairs of surfaces or habitats [TW, SM]		

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:**
P11 state the current environmental and health and safety legislation and codes of practice [RL]	**M4** explain the importance of planning estate maintenance work.	**D2** discuss how to plan and carry out specified estate maintenance tasks to overcome problems and demonstrate responsible working practices.
P12 describe how to overcome problems presented by services [IE, EP]		
P13 describe how environmental damage can be minimised [IE, TW, EP]		
P14 describe how organic and inorganic waste may be disposed of. [IE, TW, EP]		

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

The delivery of this unit is likely to have a highly practical content, with learners given sufficient time to develop their practical skills. Delivery of the underpinning knowledge is likely to involve a range of techniques, including classroom based sessions, visits, guest speakers and links to appropriate work experience.

Health and Safety and environmental protection should be covered at the beginning of this unit as this will allow the learner to develop underpinning knowledge of the possible hazards and risks involved in their practical activities. The use of a safety officer or an outside speaker would be able to back up theory with up-to-date legislative requirements and also indicate service providers. A clear link to risk assessments should follow so they can be completed prior to undertaking practical tasks. Tutors should be up to date on the key aspects of legislation and ensure that practical activities are carried out safely and legally. Learners should understand how laws affect them while working practically both in the centre and in the workplace.

When using hand tools the tool should be set in context of the industry being studied. It is expected that tutors will cover all tools listed while working practically. This can be achieved by demonstration, supervised practical activities and observation however, if this is not possible the tool should be identified and examples of use given. Safe use, storage and transportation of tools can be achieved through practical activities and observations within the tool shed/workshop and should be backed up with care and maintenance tasks.

The estate maintenance of boundaries, surfaces and habitats are closely related to their delivery. The techniques of this delivery should be varied, but must be practically based to meet the criteria. Learners should have the opportunity to identify different types of boundaries, surfaces or habitats which are already established in order to link theory and practice. This may have to be achieved on visits to different businesses within their own area of study. Learners will also need access to practical areas where they can put into practice those skills learnt in the classroom. It is essential that learners understand the importance of the environmental issues that surround their practical tasks and deal with waste accordingly throughout their work.

It is expected that learners will investigate the uses of boundaries fully, identifying the purpose of those maintained in earlier tasks. During classroom based lessons, active problem solving tasks can be used to cover all listed problems that may occur during estate maintenance activities in the unit content. Learners should have access to a range of path materials to cover both fluid and hard components. Those that cannot be practically accessed should be identified while on visits or via research.

Learners may have the opportunity to contribute to the maintenance of boundaries, surfaces or habitats while on work placements. 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 Edexcel website.

Tutors should not expect learners to do physical tasks that are beyond their physical capabilities.

Tutors could integrate the delivery, private study and assessment relating to this unit with any other relevant units and assessment instruments in the learners programme of study.

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: Being Safe and Considering the Environment (P11, P12, P13, P14, M4, D2) Tutor introduces the assignment brief.
Theory based sessions: Introduction to health and safety to develop underpinning knowledge of the possible hazards and risks involved in their practical activities. Accident reporting, consequences of accidents at work, personal protective equipment (PPE), risk assessments, safe manual handling techniques.
Practical: carrying out a risk assessment.
Theory based sessions: Theory based sessions current environmental legislation and codes of practice, environmental protection and waste disposal.
Site visit: potential problems presented by services, disposing of waste, environmental good practice.
Personal study, assessment completion and support.
Assignment 2: Tools and Equipment (P1, P2, P3, P4, M1) Tutor introduces the assignment brief.
Theory session: introduction to tools, types and purpose.
Practical sessions: selecting tools and equipment for tasks.
Theory session: safe lifting principles, how to apply in practice, how to transport safely.
Practical sessions: safe lifting and transport of tools and equipment.
Theory: Maintenance and storage of tools and equipment, reasons why important, how to carry out checks and maintenance.
Practical sessions: maintenance and storage of tools and equipment
Assignment 3: Boundary Maintenance (P5, P6, P7, P8, M2) Tutor introduces the assignment brief.
Theory session: assessing maintenance needs and purpose of boundaries, types of maintenance and repair for different boundary types.
Visits to see examples of different boundaries and maintenance required.
Practical demonstrations, activities and assessments on boundaries
Assignment 4: Surface or Habitat Maintenance (P9, P10, M3, D1) Tutor introduces the assignment brief.
Classroom session: types of surface and habitat.
Practical session: assessing condition of surfaces/habitats.
Theory session: planning maintenance of surfaces/habitats.
Practical sessions: maintenance and repair of surfaces/habitats.
Unit review.

Assessment

Learners will need to meet all pass criteria to successfully complete this unit.

Assessment of P1, P2, P3 and P4 could be linked. Learners are required to demonstrate the selection (P1), safe lifting (P2), transportation and use (P3) and maintenance (P4) of at least four hand tools or

pieces of equipment. Evidence for this criterion should be linked to the work being done for P6, P7, P8 and P10. The range of hand tools provided for evidence will therefore vary in relation to the work that is being carried out for these criteria during practical activities. 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 Edexcel website.

For P5, learners need to assess the condition of boundaries for maintenance requirement; assessment could be in the form of individual oral questioning or maintenance planning sheets. A minimum of two boundaries should be included. These may be selected by the tutor or agreed through discussion with the learner.

Assessment of P6, P7 and P8 could, as indicated above, be linked with P1, P2, P3, P4 with suitable projects and with assessment evidence in the same format. It is expected that learners will work with at least two different boundaries, for assessment purposes, from the unit content list.

For P9, learners are required to assess the condition of surfaces or habitats for maintenance requirement; assessment could be in the form of individual oral questioning or maintenance planning sheets. A minimum of two surfaces or habitats should be included. These may be selected by the tutor or agreed through discussion with the learner.

Assessment of P10 could be linked with P1, P2, P3, P4 with suitable projects. It is expected that learners will work with at least two different surfaces or habitats, for assessment purposes, from the unit content list.

For P11, learners will be expected to state current health and safety and environmental legislation and codes of practice. Learners should investigate various levels of the laws relating to the individual, other employees and the employer. Evidence for this could take the form of a pictorial presentation with notes, using appropriate software, flipcharts or OHPs, an annotated poster or leaflet, or as answers to short answer questions.

For P12, learners will need to know the services they may encounter while carrying out estate maintenance work, describe problems these present and how these could be overcome. Evidence could be a written or verbal report, or annotated plans of an area showing services and how problems may be overcome.

For P13, learners need to describe how environmental damage can be minimised. A leaflet, annotated poster or project can be used, and could be linked to assessment for P4.

For P14, learners need to identify and describe a range of methods for disposing of organic and inorganic waste. Evidence should bear in mind the legislative controls, and the desire to minimise environmental damage. Evidence could be in the same format as for P3.

In addition to the pass criteria above learners wishing to gain a merit grade will have to meet all merit criteria.

For M1, learners are required to explain the importance of correct tool selection, transport, usage and maintenance. Evidence may be a verbal or written report, leaflet or presentation.

Assessment of M2 links to work completed for P5, P6, P7 and P8. To achieve M2 learners need to have demonstrated planning of the maintenance and repair tasks, and the work needs to have been completed to a high standard. This is expected to include the learner working independently, having a logical approach to completing the task, showing responsibility for the environment and checking their own work.

Assessment of M3 links to work completed for P9 and P10. To achieve M3 learners need to have demonstrated planning of the maintenance or repair tasks, and the work needs to have been completed to a high standard, as for M2.

Assessment of M4 could be an extension of work completed for P11, P12, P13 and P14. Learners are required to explain the importance of planning estate maintenance work, particularly in overcoming the potential problems identified in the pass criteria. Evidence may be a verbal or written report, leaflet or presentation.

In addition to the merit criteria above learners wishing to gain a distinction grade will have to meet all distinction criteria.

For D1, learners are required to review the work they have completed for the pass and merit criteria, and suggest further maintenance work required. These suggestions should include maintenance of tools and equipment, boundaries and surfaces/habitats. Evidence may be a presentation, report, leaflet or guidance booklet.

For D2, learners are required to discuss how to plan and carry out two estate maintenance tasks to overcome problems and demonstrate responsible practices. The tasks chosen may be selected by the tutor or agreed through discussion with the learner. This assessment links to the pass and merit criteria, and the discussion should include, for example, how to plan to work within the legislation, minimise environmental damage, overcome problems and use appropriate tools safely and effectively. Evidence may be in the same format as D1.

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 Edexcel assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P11, P12, P13, P14, M4, D2	Being Safe and Considering the Environment	You are working for a land based business, and have been told a school pupil is planning to work alongside you for their work experience. Create a guidance leaflet for them which explains why planning estate maintenance work is important. Include the legislation that affects your work, how to overcome problems presented by services, how to dispose of waste and minimise environmental damage. Your leaflet should also show how to plan and carry out two tasks to overcome problems and demonstrate responsible practices.	Leaflet.
P1, P2, P3, P4, M1	Tools and Equipment	You are helping a busy countryside ranger with their work. You will be asked to select appropriate tools and equipment, lift them safely, transport and use them, and then maintain and store them. Create some notes for your work experience pupil explaining the importance of correct tool selection, transport usage and maintenance.	Observation records. Witness statements. Guidance notes.
P5, P6, P7, P8, M2	Boundary Maintenance	In your role you have been asked to plan and carry out routine repairs and maintenance of two boundaries. Before starting, assess the condition of the boundaries to plan the work needed. You will need to dispose of any waste in line with instructions.	Observation records. Photographic evidence.

Criteria covered	Assignment title	Scenario	Assessment method
P9, P10, M3, D1	Surface or Habitat Maintenance	Having completed the boundary tasks to a high standard you have now been asked to maintain or repair two surfaces or habitats. Before starting, assess the condition to determine the work needed. After completing these tasks, discuss the purpose of the work completed and suggest further maintenance required.	Observation records. Photographic evidence. Verbal 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 Environmental and Land-based sector suite. This unit has particular links with the following unit titles in the Environmental and Land-based suite:

Level 2	Level 3
Element CU19.1 Construct and maintain boundaries Element CU19.2 Construct and maintain paths	Undertake Estate Skills
Undertake Work Experience in the Land-based Industries	

Essential resources

Access to an area of land where practical work can be carried out is essential. Centres may need to provide transport for learners to travel to suitable sites. First aid facilities and appropriately trained staff are essential for such visits. Also required is a sufficient range and quantity of hand tools and materials to allow the tasks to be undertaken safely.

Ideally, tasks should be carried out 'for real' but, where this is not possible, temporary work is permissible. Powered machinery can be used where appropriate.

Employer engagement and vocational contexts

This unit focuses on the skills of estate maintenance and will provide learners with a basic knowledge of undertaking tasks on boundaries and surfaces or habitats. Learners will be encouraged to develop an understanding of health and safety while working and will consider environmental protection and ways of minimising damage in addition. Centres are encouraged to develop links with local businesses within the sector being studied so learners can experience the day-to-day running of a busy estate via guest speakers and visits.

Indicative reading for learners

Textbooks

Agate E – *Fencing: A Practical Handbook* (BTCV, 2001) ISBN 9780946752294

Agate E – *Footpaths: A Practical Handbook* (BTCV, 2001) ISBN 9780946752317

Agate E – *Toolcare: A Maintenance and Workshop Manual* (BTCV, 2000) ISBN 9780946752249

Agate E – *Tree Planting and Aftercare: A Practical Handbook* (BTCV, 2001) ISBN 9780946752256

Agate E – *Woodlands: A Practical Handbook* (BTCV, 2002) ISBN 9780946752331

Brooks A and Agate E – *Hedging: A Practical Handbook* (BTCV, 1998) ISBN 9780946752171

Brooks A and Agate E – *Waterways and Wetlands: A Practical Handbook* (BTCV, 2001)

Brooks A, Adcock S and Agate E – *Dry Stone Walling: A Practical Handbook* (BTCV, 1999) ISBN 9780946752195

Butterfield W H – *Making Fences Walls and Hedges* (BiblioBazaar, 2009) ISBN 9781110871339

Health and Safety Executive leaflets eg Manual Handling Assessment Charts (HSE, 2003) ISBN 9780946752300

Key R – *Garden Surfaces: 20 Projects for Paths, Decks, Steps Patios and Edgings* (Laurel Glen Publishing, Feb 2003) ISBN 9781571458247

Kindersley D – *Walls and Fences* (RHS Practicals), 2nd revised edition (Dorling Kindersley; 2003) ISBN 9780751348620

MacLean M – *New Hedges for the Countryside* (Farming Press Books and Videos, 1992) ISBN 9780852362426

Negus J and Bradley V – *Garden Tools: An Illustrated Guide to Choosing, Using and Maintaining* (Carroll & Brown Publishers Limited; illustrated edition, 2001) ISBN 9781903258231

Scottish Executive Rural Affairs Department – *Prevention of Environmental Pollution from Agricultural Activity: Code of Good Practice Dos and Don'ts Guide* (Scottish Executive, 2002) ISBN 9780755905188

Stokes A – *Health and Safety Overview for Practical Conservation Project: A Guide to Good Practice for Conservation Groups and Land Managers* (BTCV, 1999)

Sutherland W J – *Managing Habitats for Conservation, 1st edition* (Cambridge University Press, 1995) ISBN 9780521447768

Websites

www.btcv.org.uk	British Trust for Conservation Volunteers
www.defra.gov.uk	Department for Environment, Food and Rural Affairs
www.fwag.org.uk	Farm Wildlife and Advisory Group
www.hsegov.uk	Health and Safety Executive
www.lantra.co.uk	Lantra Sector Skills Council
www.naturalengland.org.uk	Natural England
www.rhs.org.uk	Royal Horticultural Society

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	reporting how to overcome problems faced while working reporting on how environmental damage can be minimised describing how to overcome typical problems that may occur during estate maintenance activities describing appropriate situations for paths
Creative thinkers	Assessing the condition of boundaries, surfaces or habitats to determine maintenance requirement
Reflective learners	reviewing the purposes of different types of boundaries presenting current environmental and health and safety legislation and codes of practice
Team workers	taking responsibility for the environment carrying out maintenance tasks safely
Self-managers	selecting appropriate tools/equipment for specific estate maintenance tasks Lifting, transporting, maintaining and storing tools and equipment safely using appropriate techniques carrying out maintenance tasks safely
Effective participators	reporting how to overcome problems faced while working reporting on how environmental damage can be minimised describing how to overcome typical problems that may occur during estate maintenance activities.

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	investigating key points of the current environmental and health and safety legislation and codes of practice
Creative thinkers	applying techniques to maintenance tasks
Reflective learners	evaluating own performance action planning and target setting for future activities
Team workers	peer help and support during tasks
Self-managers	risk assessment completion
Effective participators	investigating problems that occur when lifting incorrectly.

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	presenting information on current environmental and health and safety codes of practice
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	researching the internet for current environmental and health and safety codes of practice
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	designing maintenance planning sheets presenting leaflets and pamphlets producing risk assessments for practical tasks
Bring together information to suit content and purpose	
Present information in ways that are fit for purpose and audience	presenting information on current environmental and health and safety codes of practice
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	
Identify the situation or problem and the mathematical methods needed to tackle it	

Skill	When learners are …
Select and apply a range of skills to find solutions	producing risk assessment for practical tasks
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	
Draw conclusions and provide mathematical justifications	producing risk assessment for practical tasks
English	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	presenting information on current environmental and health and safety codes of practice
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	researching for current environmental and health and safety codes of practice
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	reporting how to overcome problems faced while working reporting on how environmental damage can be minimised describing how to overcome typical problems that may occur during estate maintenance activities describing appropriate situations for paths reviewing the purposes of different types of boundaries producing risk assessment for practical tasks.

Unit 7: Introduction to Fish Farming

Unit code: T/601/0442

Level 2: BTEC First

Credit value: 10

Guided learning hours: 60

Aim and purpose

This unit aims to introduce learners to fish farming skills and knowledge and how these can be applied in practice. It is designed for learners in centre-based settings looking to progress into the sector or onto further/higher education.

Unit introduction

The farming of fin fish and shellfish (aquaculture) is becoming globally important as the world's human population increases and the pressures on wild stocks increases beyond sustainable levels.

New technology, improved feeds and health management have all helped the aquaculture industries develop quickly, producing fish not just for human food but also for the restocking of sport fisheries, conservation projects and for the aquatics markets.

This unit concentrates on freshwater fish farming in the UK, although learners will have the opportunity to study the whole industry including the marine farming industry. Learners will also study the whole range of factors that affect the aquaculture industries within the United Kingdom.

The second part of the unit will allow learners the opportunity to study the main production systems used in freshwater and marine environments for farming fish in the United Kingdom. This element will particularly concentrate on the new technologies available to the aquaculture industry.

The final parts of the unit will concentrate on the more practical aspects of the industry. The first part looks at the monitoring of water quality and fish health – both vital aspects of good fish husbandry. The second part will allow the learners to undertake practical activities in the routine maintenance and feeding of stocks of fish.

Learners will concentrate on the principal species of fish produced in farms in the UK for example salmonids, coarse fish and marine species.

Throughout the unit the importance of animal welfare, human health and safety and environmental issues associated with fish farming will be emphasised.

Learning outcomes

On completion of this unit a learner should:

1 Know the structure of the fish farming industry in the United Kingdom

2 Know how fish farming systems operate

3 Be able to monitor a fish production unit

4 Be able to undertake practical fish farming duties.

Unit content

1 Know the structure of the fish farming industry in the United Kingdom

Aquaculture activities: reasons for commercially farming particular fish eg Atlantic salmon, rainbow trout, brown trout, carp, tilapia, halibut; types of businesses involved in fish farming; types of markets; location of the main production sites with regard to climate, water availability, topography, services availability, site requirements, labour requirements, markets and species produced; production levels; number of fish and shellfish farming businesses and employees

External factors: current factors affecting the industry; relevant current legislation eg Aquatic Animal Health Regulations 2008, discharge consent licences; impact of farming activities on the surrounding environment eg fish feeds, pollutions, importation of fish and fish diseases; Other factors eg climate change, competition for water

2 Know how fish farming systems operate

Farming methods: principles of intensive and extensive fish farming systems; design and construction of holding facilities (hatchery systems, ponds, tanks, cages, raceways); water movement within systems eg gravity fed, re-circulation, flow-through; potential problems affecting production for different types of farm; main systems used to produce each species

Equipment and facilities: function of equipment and facilities used for water abstraction, effluent discharge, mechanical and biological filtration, oxygenation and aeration systems, screening, water movement, feeding systems, grading systems

Processes in production: production cycles (brood stock conditioning, spawning methods, egg incubation, larval development, feeding, fry rearing, on-growing, sample weighing, grading, harvesting, culling and sales) for a farmed salmonid, a coarse fish and a marine fish

3 Be able to monitor a fish production unit

Monitoring and recording: methods used to collect and record essential information relating to environmental factors, food consumption, fish growth rates, fish health, water quality eg oxygen, pH and temperature; water quantity; importance of food conversion ratio (FCR); methods used to calculate food conversion ratios and feed rations

Fish health: visible signs of stress, deformity and ill health (changes in behaviour, appearance and feeding habits); examine fish for parasitic infections, including the preparation of squash mounts; identification of common parasites; methods of disease prevention; importance of effective husbandry; treatments for common diseases; health and safety issues and risk assessment associated with basic disease management; relevant current legislation

4 Be able to undertake practical fish farming duties

Clean and maintain equipment and facilities: methods for cleaning and disinfecting holding units and other equipment eg screens, nets; mortality removal and disposal; daily, weekly and annual routine maintenance tasks; health and safety and risk assessment; use of suitable Personal Protective Equipment (PPE)

Fish production duties: hatchery methods and equipment used for natural and artificial spawning; monitoring egg and larval development; removal and disposal of dead or infertile eggs, juvenile and on-grown fish; range of natural and artificial feeds used in farming fish; methods and equipment used to feed fish at various stages of growth; feed storage and handling; methods and equipment used to count and grade (size and quality), transportation and harvesting of fish; relevant current legislation and welfare issues; methods of pest and predator control; relevant current legislation; health and safety

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 structure and size of the fish farming industry in the United Kingdom		
P2 describe the reasons for commercial fish farming	**M1** describe how a specified fish farm may have an impact on the environment	**D1** describe how the fish farming industry is attempting to improve its environmental performance
P3 outline factors that influence the fish farming industry [CT]		
P4 describe common fish farming systems		
P5 identify equipment and facilities used within fish farms	**M2** evaluate a specified piece of modern fish farming equipment	
P6 describe the flow of water through a specified fish farm, identifying potential problems that may occur between the inlet and outlet [IE]		
P7 collect and analyse a series of water samples from a specified fish farm		
P8 assess collected water samples against species requirements	**M3** explain why good husbandry is important in maintaining the health of the fish stock	**D2** explain how to calculate ration size and food conversion ratio and explain the importance to the fish farm.
P9 clean fish holding facilities [TW]		
P10 feed, count and grade fish to meet specified objectives. [TW]	**M4** explain how to artificially spawn a named species of fish.	

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 is likely to be a mixture of classroom learning and practical fish farming activities. Assessment is likely to be in the form of a portfolio of relevant evidence.

This unit should be delivered in a practical context wherever possible. Lectures, discussions, seminar presentations, site visits, supervised hatchery and farm practicals, research using the internet and/or library resources and the use of personal and/or industrial experience would all be suitable.

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 prior to any work-related activities, so that naturally occurring evidence could be collected at the time. For example, learners may have the opportunity to feed or grade fish in a fish farm and they should be encouraged to ask for observation records and/or witness statements to be provided as evidence.

It is essential that tutors stress the importance of animal welfare, sound environmental management and the need to manage the resource using legal methods. Health and safety issues relating to working in and around water must be stressed and regularly reinforced and risk assessments must be undertaken prior to practical activities. Health and safety issues must be addressed before learners visit any fish farm. It is particularly important to emphasise the importance of biosecurity before visiting any fish farm.

The first part of this unit is based around underpinning knowledge of the fish farming industry. It is likely to be delivered by formal lectures, discussion, site visits and independent learner research. Learners will become aware of the structure of the fish farming industry in the United Kingdom and the external factors that affect it. Visiting expert speakers and site visits would add to the relevance of the subject for the learner. For example, a fish farm manager could talk about their work and their part of the industry.

The methods, processes, equipment and facilities that are used to farm fish in the United Kingdom are covered in the second part of this unit. Due to the diversity of the industry learners should, as a minimum, cover specific information relating to a farmed salmonid and a farmed coarse fish. It would be useful to cover at least one farmed marine fish to show the scale of the industry. It would be expected that formal lectures, discussions, visiting speakers and site visits would form part of the delivery of this outcome. It is particularly important to see some of the equipment and processes in operation, so site visits will be particularly important.

The last parts of this unit are practically based. The first part looks at the methods used to monitor and record information relating to environmental factors, water quality, fish growth, fish health and food use and conversion on a fish production unit. It would be expected that supervised hatchery and farm practicals would form part of the delivery, as well as formal lectures, discussions and site visits. Health and safety issues must be addressed before learners undertake any practical work with any items of equipment. Adequate PPE must be provided and used following the production of suitable risk assessments. Biosecurity and animal welfare issues must be addressed before any practical activities. Visiting expert speakers could add to the relevance of the subject for the learner.

The last part of this unit deals with the practical routine duties surrounding the work on a fish farm. It is likely to be delivered through supervised hatchery and farm practicals as well as formal lectures, demonstrations and discussion. This area should be contextualised to meet the needs of requirements of the learner to study particular areas of the fish farming industry. Tutors should ensure that learners are introduced to a suitable range of mechanised equipment and facilities that are used within the sector being studied. Health and safety issues must be addressed before learners undertake any practical work with any items of equipment. Adequate PPE must be provided and used following the production of suitable risk assessments. Visiting expert speakers could add to the relevance of the subject for the learner. For example,

a carp or trout farmer could talk about their work and the equipment they use.

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 of planning the delivery and assessment of this unit.

Topic and suggested assignments/activities and/assessment
Introduction and overview of the topic.
Overview of reasons for and structure and size of fish farming industry.
Overview of systems used in fish farming.
Discussion on environmental impact of fish farming.
Assignment 1: Fish Farming in the UK (P1, P2, P3, P4, M1, D1) Tutor introduces the assignment brief.
Review fish farming methods and mechanisation.
Relate processes and production back to the overview of fish farming in the UK.
Discussion of methods the fish farming industry can and does use to improve its environmental performance.
Theory behind monitoring fish production units.
Practical – monitoring fish production unit.
Assignment 3: Fish Farming Equipment (P4, M2, M4) Tutor introduces the assignment brief.
Practical – Routine duties on fish farms.
Practical – feeding counting and grading fish.
Assignment 2: Fish Farm working (P5, P6, P7, P8, P9, P10, M3, D2) Tutor introduces assignment brief.
Practical – completion of assignment 3.
Fish health monitoring.
Unit review.

Assessment

For P1, learners must describe the structure and size of the fish farming industry in the United Kingdom. As a minimum learners will be expected to describe the species produced, production levels, number of farm sites, the major areas of production for each species and the number of employees. Evidence for this could take the form of a pictorial presentation with notes, an annotated poster, web page or leaflet.

P2 requires the learners to describe the reasons for commercial fish farming. Learners will be expected to identify and describe the main reasons including a description of relative sizes of the markets. Learners should consider the table, the restocking for sport fishing and conservation and the aquatics markets. Evidence will probably take the same form as P1.

For P3, learners are required to outline factors that influence the fish farming industry. Learners will be expected to concentrate on factors that are currently important to the industry. Evidence will probably take the same form as P1.

P4 requires the learners to describe common fish farming systems. Learners will be expected to describe at least four different systems that are commonly used to farm fish as well as example sites. Evidence could

take the same form as P1 or be in the form of a report. P4 can also be combined with P5 which requires learners to identify equipment and facilities used within fish farms. For this, learners will be expected to identify at least five pieces of specialist equipment and relate them to a particular form of fish farming if appropriate.

P6 requires learners to describe the flow of water through a specified fish farm, identifying potential problems that may occur between the inlet and outlet. The specified fish farm should be agreed in discussion with the learner. This criterion could be assessed directly by the tutor during practical activities or during a placement. If assessed during a placement, witness statements should be provided by a suitable representative and verified by the tutor. Alternatively, evidence could be presented in the same format as for P1.

P7 requires learners to collect and analyse a series of water samples from a specified fish farm and assess these against the requirements of the fish species being farmed. The specified fish farm may be the same as that used to provide evidence for other criteria in this unit. The series may be taken either over a period of time or as a series through the fish farm. Evidence is likely to be in the form of a data sheet with appropriate sample analysis displayed as a report. P8 requires learners to assess collected water samples against species requirements. It would be sensible to combine this criterion with P7 and use the collected data to assess its suitability against a specified fish species. The species should be agreed in consultation with the learner. Evidence can therefore be included as part of the report for P7.

P9 and P10 require learners to clean fish holding facilities and feed, count and grade fish to meet specified objectives. Tutors should decide the specified objectives in discussion with learners and should include the ability to repeat the processes adequately on successive occasions. Evidence is likely to be in the format of a log book and witness statements.

For M1, learners are required to describe how a specified fish farm may have an impact on the environment. Learners should be required to consider the wider aspects of environmental impact, not just those relating to the aquatic environment. The specified fish farm should be agreed in discussion with the learner and may be the same as that used for other criteria within this unit. Evidence may be in the same format as for P1.

M2 requires the learner to evaluate a specified piece of modern fish farming equipment. The piece of equipment should be agreed in discussion with the learner and the learner must evaluate it against either a non-mechanised performance of the task or older, redundant, equipment. Evidence is likely to be in a similar format to P1.

For M3, learners must explain why good husbandry is important in maintaining the health of the fish stock. Learners should be encouraged to use examples of good practice that they have carried out or seen in the delivery of this unit as part of the evidence that they produce for this criterion. Evidence may be in the same format as for P1.

For M4, learners must explain how to artificially spawn a specified farmed fish. Tutors should agree the species in discussion with the learner. The learner must, as a minimum, describe the process from broodstock conditioning to obtaining fertile eggs. Evidence may be in the same format as for P1 or P2.

D1 requires learners to explain how the fish farming industry is attempting to improve its environmental performance. Learners should concentrate on one area of the industry. The description should include at least four areas of potential improvements, including actual examples of improvements. Evidence for this could take the form of a pictorial presentation with notes, an annotated poster, web page or leaflet.

For D2, learners are required to explain how to calculate ration size and food conversion ratio and explain the importance to the fish farm. Learners should be encouraged to use examples of what they have done or seen in the delivery of this unit as part of the evidence that they produce for this criterion. Evidence may be in the same format as for P1.

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 Edexcel assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1, P2, P3, P4, M1, D1	Fish Farming in the UK	You have backers who will enable you to build a fish farm. You therefore need to review fish farming in the UK. Describe the structure, size and reasons for commercial fish farming in the UK. Outline the factors that influence the fish farming industry and relate this information to possible choices for your farm. Describe possible systems that you could consider. Environmental impact is a major factor in success of fish farms. Describe the possible impacts your proposed farm may have and outline how the rest of the industry is attempting to improve environmental performance and how you would build this into a plan for a fish farm development.	Individual research and written report.
P4, M2, M4	Fish Farming Equipment	Mechanisation of certain areas of fish farm work is an important but potentially expensive process. Choose a fish farming task (for example grading, feeding) and investigate available equipment. Chose one piece of equipment and evaluate it to perform the task on a specified farm site.	
P5, P6, P7, P8, P9, P10, M3, D2	Working on a Fish Farm	You are beginning a work placement on a fish farm and need to understand how it works. Draw a plan diagram of the fish farm site. Describe the flow of water and identify potential problems that may occur between the inlet and outlet. Plan and collect a series of water quality samples. Analyse and assess these WQ samples and assess them against species that could be farmed on the site. In discussion with the site manager feed count and grade fish to meet specified objectives and complete cleaning tasks throughout the farm. Explain why it is important that these husbandry tasks are important in maintaining the health of the fish. For one of the stocks of fish calculate the feed requirements and then use data collected on the farm to calculate food conversion rates. For one of the species on the farm describe in detail how to artificially spawn the fish.	Work log, witness statements and 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 Environmental and Land-based sector suite. This unit has particular links with the following unit titles in the Environmental and Land-based suite:

Level 2	Level 3
Introduction to Fish Biology	Understanding Aquatics Management
Introduction to Fish Health	Understanding Fishery Management
Participate in Providing Estate Maintenance	Understanding Freshwater and Wetland Management
FiM1 Prepare to stock fish in a fishery FiM2 Stock fish into a fishery FiM3 Monitor fisheries habitat FiM4 Collect fish samples to monitor the condition of a fishery	

Essential resources

Essential facilities for this unit include regular and routine access to a fish farm. This farm must provide access to the range of equipment that is normally used to farm fish commercially. This unit also requires access to a laboratory containing equipment for water testing.

Staff delivering this unit should be competent and experienced fish farmers. Ideally they should have recent industrial experience, or show evidence of regular contact with the industry and/or technical updating.

Employer engagement and vocational contexts

This unit focuses on the background for fish farming and the practical aspects of basic fish husbandry. Centres are encouraged to build links with a variety of fish farm sites within their area. These basic skills need to be put into context within the industry and their importance exemplified by practitioners. Site visits and guest speakers will therefore be particularly important.

Indicative reading for learners

Materials that illustrate the level of learning required and that are particularly relevant.

Beveridge M C M – *Cage Aquaculture* (Blackwell Publishing, 2004) ISBN 1405108428

Heen K, Monahan R L and Utter F – *Salmon Aquaculture* (Helsted, 1993) ISBN 0470221399

Horvath L, Tamas G and Seagrave C – *Carp and Pond Fish Culture* (Fishing News Books, 2002) ISBN 0852382820

Laird L and Needham T – *Salmon and Trout Farming* (Ellis Horwood, 1994) ISBN 0137883242

Pillay T V R and Kutty M N – *Aquaculture Principles and Practices* (Blackwell Publishing, 2005) ISBN 1405105321

Roberts R J and Shepherd C J – *Handbook of Trout and Salmon Diseases* (Blackwell Science, 1997) ISBN 085238448

Sedgwick S D – *Trout Farming Handbook* (Fishing News Books, 1995) ISBN 0852382324

Shepherd C J and Bromage N – *Intensive Fish Farming* (Blackwell Science, 1992) ISBN 063203467X

Southgate P and Lucas J – *Aquaculture: Fish and Shellfish Farming* (Fishing News Books, 2003) ISBN 0852382227

Stead S and Laird L – *The Handbook of Salmon Farming* (Springer-Verlag UK, 2001) ISBN 1852331194

Journals

Fish Farmer

Fish Farming International

Websites

www.britishtrout.co.uk	British Trout Association
www.cefas.co.uk	Centre for Environment, Fisheries and Aquaculture Science
www.defra.gov.uk	Department for Environment, Food and Rural Affairs
www.environment-agency.gov.uk	Environment Agency
www.lantra.org.uk	Lantra Sector Skills Council
www.scottishsalmon.co.uk	Scottish Salmon Producers' Organisation Online
www.thefishsite.com	The website for the global aquaculture industry

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	describing the flow of water through a specified fish farm, identifying potential problems that may occur between the inlet and outlet
Creative thinkers	outlining factors that influence the fish farming industry
Team workers	cleaning fish holding facilities feeding, counting and grading fish to meet specified objectives.

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	explaining how to calculate ration size and food conversion ratios
Creative thinkers	describing how a specified fish farm may have an impact on the environment
Reflective learners	evaluating a specified piece of modern fish farming equipment
Self-managers	collecting and analysing water samples from a specified fish farm
Effective participators	describing how fish farming is attempting to improve its environmental performance.

Functional Skills – Level 2

Skill	When learners are …
ICT – Use ICT systems	
Manage information storage to enable efficient retrieval	collecting and analysing a series of water samples from a specified fish farm
ICT – Find and select information	
Select and use a variety of sources of information independently for a complex task	describing the structure and size of the fish farming industry in the UK
Access, search for, select and use ICT-based information and evaluate its fitness for purpose	describing fish farming systems
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	collecting and analysing a series of water samples from a specified fish farm
Bring together information to suit content and purpose	collecting and analysing a series of water samples from a specified fish farm
Present information in ways that are fit for purpose and audience	collecting and analysing a series of water samples from a specified fish farm
Mathematics	
Identify the situation or problem and the mathematical methods needed to tackle it	explain how to calculate ration size and food conversion ratios
Select and apply a range of skills to find solutions	explain how to calculate ration size and food conversion ratios
English	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	discussing the environmental impacts and improvements made by the fish farming industry
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	describing the structure and size of the fish farming industry in the UK describing fish farming systems
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	describing the structure and size of the fish farming industry in the UK describing fish farming systems.

Unit 8: Introduction to Game and Coarse Angling

Unit code: T/600/9825

Level 2: BTEC First

Credit value: 10

Guided learning hours: 60

Aim and purpose

The learner will look at the structure and diversity of angling in the United Kingdom and the angler's responsibilities to the environment, wildlife and fish. They will consider the commonly found equipment and methods used to catch game and coarse fish species and develop angling skills.

Unit introduction

Angling has been, for many years, one of the most popular pastimes in the UK. In recent years the demand for access to high quality fish, waters and facilities has increased and new angling equipment, baits and techniques are constantly being developed using new materials and technologies. However, there is still a place room for traditional methods, baits and equipment.

External pressures on the angling industry, such as water pollution, animal welfare and environmental responsibilities, cannot be ignored if the industry is to continue to flourish. This will always be a factor for those employed in the angling industry or who enjoy angling as a pastime. Consequently, anglers and those employed in the industry should strive to maintain the highest standards, especially those related to animal welfare.

The first part of this unit looks at the structure and diversity of angling in the UK. This will give learners a good insight into the angling industry and the opportunities available for angling locally and nationally.

The angler's responsibilities to the environment, wildlife and, importantly, to fish themselves is the focus of the second part of this unit. It is essential that anglers are aware of their role within the environment they fish in.

The final part of the unit covers the common equipment and methods used to catch game and coarse fish species. Learners will be expected to demonstrate angling methods and be aware of the tackle they should use. Learners will develop a range of techniques, taking into account fish welfare and health and safety at all times.

Learning outcomes

On completion of this unit a learner should:

1 Know the structure and diversity of angling in the UK

2 Understand the angler's responsibility to the environment, fish and wildlife

3 Be able to demonstrate game angling skills

4 Be able to demonstrate coarse angling skills.

Unit content

1 Know the structure and diversity of angling in the UK

Structure and diversity in the UK: major fish species angled for; categories and methods of angling (game, coarse, sea); number of anglers in each category (regional, national); main geographical locations for game and coarse fishing; range of angling opportunities eg river, stillwaters, put-and-take, catch and release, day and season ticket waters, syndicates; typical facilities offered at coarse and game angling venues eg access, lodge, shop, toilets, car park, angling pegs/beats

Angling organisations: role of local organisations eg local clubs, associations, angling schemes; the role of national angling organisations eg The Angling Trust, The Salmon and Trout Trust, The Countryside Alliance; the role of anti-angling organisations eg People for the Ethical Treatment of Animals, Animal Aid

The Environment Agency: role of the Environment Agency in managing the national fisheries resource and angling; close seasons; the rod-licensing scheme; angling bylaws; angling participation and initiatives

2 Understand the angler's responsibility to the environment, fish and wildlife

Wildlife and environmental responsibilities: identifying and reporting water pollution incidents; responsible disposal of unwanted materials eg litter, nylon, hooks; respecting close seasons, fishery rules, other anglers and water users, wildlife and their habitats especially during sensitive times (such as bird nesting seasons), property, neighbours; following the Countryside Code; types of environmental improvements undertaken by anglers eg restocking programmes, weed removal, use of scour boards

Responsibilities to fish: handling fish correctly according to size, species; humane methods of despatching fish; correct methods of returning fish live to the water; respecting close seasons; using fish friendly measures eg unhooking mats, barbless hooks, fish friendly keepnets and landing nets, equipment that is in good condition and adequate for the angling situation, fish care kits; follow fishery rules eg regarding types of bait, hooks; reporting signs of ill health in fish to fishery staff; environmental impact of overuse of groundbaits

3 Be able to demonstrate game angling skills

Game angling: commonly used angling tackle for fly fishing and spinning (rods, reels, lines (eg fly lines, monofilament)), flies, baits and spinners; associated equipment eg landing net, fly box, priest, marrow spoon; correct methods of assembling tackle for use eg balanced set ups, fly lines and; angling knots eg blood knot, half blood knot; methods of casting eg overhead cast, roll cast; identification of fish holding areas; health and safety eg Weil's Disease, drowning, hooks; personal protective equipment (PPE) eg hat and glasses, waders, lifejackets; responses to emergency situations eg falling in deep water, while wearing thigh and chest waders; costs of game angling tackle and accessories; tackle maintenance

Flies: use and identification of different types of flies (dry fly, wet fly, nymph and lures); how and when to fish them (matching the hatch); leader set ups eg two/three fly leaders; methods eg the bung, washing line, the duo, French leader

Fly lines: use and identification of the different types of fly line eg floater, sink tip, intermediate, di3, di5, di7, high density; fly line profiles eg double taper, weight forward, level, shoot head; fly line ratings eg Association of Fishing Tackle Manufacturers (AFTM) ratings

4 Be able to demonstrate coarse angling skills

Coarse angling: commonly used angling tackle for coarse fishing (rods, reels, poles, lines, floats, weights, feeders, hooks, baits, lures); associated equipment eg landing net, keep net, disgorger, forceps, bite indicators, catapult, bait boxes, unhooking mat, sling/sack, weighing scales, seat boxes; correct methods of assembling tackle for use eg balanced set ups, terminal rigs; angling knots eg blood knot, half blood knot; methods of casting; uses of different types of baits and lures and how to fish them; identification of fish holding areas; groundbaiting methods and materials; health and safety eg Weil's Disease, drowning, hooks; personal protective equipment (PPE) eg waders, life-jackets; costs and sources of coarse angling tackle, bait and accessories; bait preparation and storage; tackle maintenance

Terminal rigs: specific coarse angling rigs eg pole rigs, hair rigs, pike rigs, feeder rigs; materials and tackle required; knots; costs; application and use; fish welfare eg fish friendly rigs

Coarse angling baits: types eg boilies, maggots, casters, pellet; their use and application; preparation; cost; effectiveness; environmental impacts; fish 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 define coarse, game and sea angling [CT]	**M1** explain the role of a local angling organisation in the UK	**D1** describe the role of the Environment Agency in relation to angling
P2 describe the main geographical locations of coarse game and sea angling in the UK [IE]	**M2** explain the role of a national angling organisation in the UK	
P3 explain the angler's responsibilities towards wildlife and the environment in a specified sport fishery [EP]	**M3** explain the methods anglers use to protect the health of fish in a specified sport fishery	
P4 discuss the use of close seasons [EP]		
P5 list the tackle required for game angling [SM]	**M4** explain the differences between dry flies, wet flies, nymphs and lures used in game angling	**D2** explain the differences in the types of fly lines used in game angling
P6 carry out game angling techniques [RL]		
P7 list the tackle required for coarse angling [SM]	**M5** make a terminal rig suitable for a specific type of coarse angling.	**D3** explain the use of a particular bait for a specified species of coarse fish.
P8 carry out coarse angling techniques. [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

Tutors delivering this unit have opportunities to use as wide a range of techniques as possible. Lectures, discussions, workshops, seminar presentations, site visits, supervised angling 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.

Adequate time should be given to each learning outcome to allow for the depth and breadth of study needed to cover the unit content.

Whichever delivery methods are used, it is essential that tutors stress the importance of animal welfare, sound environmental management and best sustainable practices.

Health and safety issues relating to working in and around water must be stressed and reinforced regularly. Risk assessments must be undertaken before any practical activities and must fully involve all learners.

Practical angling skills should be clearly demonstrated and learners should have plenty of opportunities to practise and develop them. Learners can provide and use their own equipment. Initially, the learners' angling experience is likely to be varied, therefore venues for angling practicals should be selected that allow more than one technique to be practised during the session to increase learners' range of basic angling skills.

For learning outcome 1 learners could research the different types of angling undertaken in the UK, local and national angling organisations and the role of the Environment Agency. This should be fed back and shared with the group through class discussions and reinforced with formal lectures and visiting expert speakers for example an Environment Agency fisheries officer or/and local angling club official.

Learning outcome 2 covers the angler's responsibilities to the environment, fish and wildlife. It would be expected that formal lectures, discussions, supervised angling practicals and site visits would form part of the delivery. Health and safety issues must be addressed before learners visit any sport fishery. Visiting expert speakers could add to the relevance of the subject for learners. For example, a sport fishery manager could talk about fish welfare and the methods they use. Delivery can be directly linked to that for learning outcomes 3 and 4.

Learning outcomes 3 and 4 look at the methods anglers use to catch game and coarse fish species. It would be expected that short formal lectures, discussions, workshops and supervised angling would form part of the delivery. Health and safety issues must be addressed before learners undertake practical work with any items of equipment. Adequate PPE must be provided and used following the production of suitable risk assessments. Centres should ensure that all learners know how to react to emergency situations. Visiting expert speakers could add to the relevance of the subject for learners. For example, an experienced angler could talk about the angling methods they use.

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 of planning the delivery and assessment of this unit.

Topic and suggested assignments/activities and/assessment
Introduction and overview of the unit.
Assignment 1: Angling in the UK (P1, P2, M1, M2, D1) Tutor introduces the assignment.
Small-group workshop/discussion and feedback on the different types of angling (coarse, game and sea) in the UK.
Pair research and feedback on the geographic distribution of angling and fish species in the UK.
Individual research into a local angling organisation/club with a short presentation and feedback.
Pair library and internet research into a national angling organisation with feedback and discussion.
internet research on the role of the Environment Agency in relation to angling and feedback.
Assignment 2: Code of Practice for Angling (P3, P4, M3) Tutor introduces the assignment.
Theory session: group activity to identify the angler's responsibility to wildlife and the environment, feedback and discussion.
internet research into countryside code and environmental improvements on fisheries.
internet research into the national and regional close seasons with class feedback and discussion.
Worksheets, discussion and research on fish welfare.
Assignment 3: Game Angling Techniques Practical (P5, P6, M4, D2) Tutor introduces the assignment.
Theory session on game angling to include tackle, flies, species, methods, fishery rules, fish welfare.
Practical pair and individual activity on fly casting to include health and safety and tackling up.
Game angling practicals on different venues to develop learners' skills and knowledge to reinforce all theory sessions.
internet/library research on the different types of flies, followed by practical application.
internet/library research on the different types of fly lines, followed by practical application and demonstration.
Assignment 4: Coarse Angling Techniques Practical (P7, P8, M5, D3) Tutor introduces the assignment.
Theory session on coarse angling to include tackle, species, methods, fishery rules, fish welfare.
Coarse angling practicals in different venues to develop learners' skills and knowledge to reinforce theory sessions.
Rig making workshops: presentations, annotated diagrams, practical demonstrations.
Bait workshops: research on different types, manufacturers, use, application costs etc.
Unit review.

Assessment

For P1, learners are expected to describe the three different angling disciplines undertaken in the UK, ie coarse, game and sea angling. For each discipline they will need to identify the different types of angling (for example coarse angling; pole fishing, carp fishing) the species fished for and the venues where this is undertaken. This can be linked to P2 where learners are expected to describe the size, diversity and main geographical locations of game and coarse angling in the UK. Learners will be expected to describe, as a minimum, the main species of fish that are angled for, the range of angling opportunities available for each species, the number of fisheries and anglers in each category, and a map outlining the main areas of the UK where each category of angling is found. For P1 and P2 evidence could take the form of a short assignment, a pictorial presentation with notes (possibly using appropriate software or OHPs), an annotated poster or

leaflet, or a project.

P3 requires learners to describe the angler's responsibilities towards wildlife and the environment in a specified sport fishery. Tutors could identify the specified sport fishery, or agree it in discussion with learners. Where possible, the size and complexity of the fishery should be the same for each learner to ensure assessment is fair. P4 looks at close seasons and learners should become familiar with national and regional close seasons. Learners must explain how angling close seasons help to protect the environment, wildlife and fish within a specified sport fishery. This could be assessed through learners producing a code of practice for angling. This may be in the form of a leaflet or a poster. Alternatively, evidence could be presented in the same format as for P1 and P2.

For P5, learners must be able to list and identify the tackle required for game angling. This should be the basic tackle required for a short game angling session. P5 should be linked to P6 which requires learners to assemble and use game angling tackle safely to meet given objectives. Tutors should identify the objectives but should ensure that they are the same for each learner so that the assessment is fair. The objectives should include, as a minimum, assembling the tackle correctly with the correct flies attached. Learners should then use the tackle correctly using at least an overhead cast. This could be assessed directly by the tutor during practical activities and recorded by learners in a workbook or angling log to show their understanding. If this format is used 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 Edexcel website. Learners are not required to catch a fish to meet this criterion.

For P7, learners must be able to list and identify the tackle required for a particular type of coarse angling. This should be the basic tackle required for a typical coarse angling session. P7 should be linked to P8 which requires learners to assemble and use coarse angling tackle safely to meet given objectives. Tutors should identify the objectives but should ensure that they are the same for each learner to ensure assessment is fair. The objectives should include, as a minimum, assembling the tackle correctly with the correct bait or lures attached to the terminal rig. Learners should then use the tackle correctly. This could be assessed directly by the tutor during practical activities and then recorded by learners in a workbook or angling log. If this format is used, 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 Edexcel website. Learners are not required to catch a fish to meet this criterion.

For M1, learners are required to explain the roles of a specified local angling organisation such as their local angling club and this should involve carrying out research using different information sources. M2 requires learners to explain the role of a specified national angling organisation in the UK. Tutors should identify the specified organisation, or agree them in discussion with learners. Where possible the size and complexity of the organisation should be the same for each learner to ensure fair assessment. M1 and M2 should be assessed together with P1 and P2 using the same format.

M3 requires learners to explain the methods anglers use to protect the health of the fish in a specified coarse fishery. Tutors could identify the specified sport fishery (which may be the same as that used to provide evidence for other criteria in this unit), or agree it in discussion with learners. Where possible, the size and complexity of the fishery should be the same for each learner to ensure fair assessment. Evidence should not simply relate to methods used during angling but could include, if they are appropriate for the fishery, anglers following the rules of the fishery. The rules might include, for example, groundbaits, or anglers joining working parties that either reduce predators or the stocking density of fish in the fishery. This could be assessed in the same way as P3 and P4, or directly by the tutor during practical activities that provide evidence for other criteria. If this format is used, suitable evidence from guided activities would be observation records completed by the learner and tutor.

For M4, learners must explain the differences between dry flies, wet flies, nymphs and lures and the way that they are fished. Learners will be expected to explain the lifestages of the insects that the dry and wet flies are imitating and the methods used when fishing with them. Evidence may be in the same format as for P5 and P6.

For M5, learners must make a terminal rig suitable for a method of coarse angling. This could be assessed directly by the tutor during practical activities, learners producing an annotated diagram and write up recorded in the same way as for P7 and P8.

For D1, learners are required to describe the role of the Environment Agency with regard to the management of national fisheries resources, angling and the rod licensing system. Information provided by learners should be current, giving up-to-date figures, for example for the costs of rods and the outlets they can be obtained from, and how many were issued the previous year. Evidence may be in the same format as for P1.

D2 requires learners to explain the differences in the types of fly line used by game anglers. Learners should understand the differences in weights, profiles and densities. Evidence may be in the same format as for P3.

D3 requires learners to explain the use of anglers baits when coarse angling for a specified species of coarse fish. Learners may choose the species of bait and target species themselves. Evidence may be collected whilst producing evidence for other criteria and it may be in the same format as for P7 and P8. It should include the use, preparation, application and cost for the target species.

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 Edexcel assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1, P2, M1, M2, D1	Angling in the UK	Produce a written assignment about angling in the UK focusing on the different types of angling and the geographical distribution of each. Explain the roles of a local and national angling organisation and identify the duties of the Environment Agency with regard to angling.	Written assignment.
P3, P4, M3	Code of Practice for Angling	Produce a code of practice suitable for anglers and non-anglers for a specified fishery, identifying the angler's responsibilities to wildlife and the environment. Identify local and national close seasons and explain why they are used. Highlight fish welfare measures used by anglers and fishery owners and explain why they are needed.	Leaflet or poster.
P5, P6, M4, D2	Game Angling Techniques	Demonstrate practical game angling skills and complete an angling log to show your understanding of the tackle used, the casts and health and safety issues, the flies, and how and when to use the different types of fly line.	Practical observation and assessment. Angling log.
P7, P8, M5, D3	Coarse Angling Techniques	Demonstrate practical coarse angling skills and complete an angling log to show your understanding of the tackle and methods used. Make a terminal rig and produce an annotated diagram of this. Select an angling bait and explain and evaluate its function and use when targeting a specific species of fish.	Practical observation and assessment. Angling log.

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

This unit forms part of the BTEC Environmental and Land-based sector suite. This unit has particular links with the following unit titles in the Environmental and Land-based suite:

Level 2	Level 3
Undertake Freshwater Sport Fishery Management	Understanding Coarse, Game and Sea Angling Techniques
Undertake Work Related Experience in the Land-based Industries	Undertake and Review Work Related Experience in the Land-based Sector

Essential resources

Facilities for this unit should include sufficient access to a range of stillwater and running water game and coarse fisheries. Equipment and materials required include fishing tackle for the practical activities. These can be learners' own or the centre's and will include a range of rods, reels, poles, nets, boxes and terminal tackle items. Learners will also need access to sundry smaller items in order to practise with rigs, knots, flies etc plus materials for maintaining tackle.

Tutors delivering this unit should be competent and experienced game and coarse anglers. Ideally they should also have industrial experience within the sport fishery management industry.

Employer engagement and vocational contexts

This unit focuses on practical aspects of angling and the theory aspects of the angling industry. It will give learners the background knowledge related to a variety of angling skills, techniques, tactics and application. Centres are encouraged to create and develop links with local coarse and game fisheries, angling coaches, fishery managers, tackle shops, angling clubs, angling organisations and the Environment Agency. This could be via guest lectures, tackle workshops and visits to local fisheries and tackle shops. Learners could develop and apply their knowledge by leading angling coaching sessions and tackle workshops for others within the group or people new to the sport.

Indicative reading for learners

Textbooks

Bingham C and Allen A C – *Fundamentals of Freshwater Fishing* (Swan Hill Press, 1999) ISBN 1853109967

Brown D – *Field Guide to Fishing Knots: Essential Knots for Freshwater and Stillwater Angling* (Wilderness Adventure Press, 2003) ISBN 1932098038

Falkus H and Buller F – *Freshwater Fishing* (Ebury Press, 1998) ISBN 0091864518

Greenhalgh M – *The Pocket Guide to Freshwater Fish of Britain and Europe* (Mitchell Beazley, 2001) ISBN 1840003928

Housby T, Oglesby A, Wilson J and McClane A J – *The Complete Book of Fishing: A Guide to Freshwater, Saltwater and Big-game Fishing* (Hamlyn, 1999) ISBN 0600592103

Miles T, Ford M and Gathercole P – *The Complete Fisherman's Handbook* (Southwater, 2003) ISBN 1842158198

Templeton R G (Editor) – *Freshwater Fisheries Management* (Fishing News Books, 1995) ISBN 085238209X

Magazines

Angling Times magazine

Anglers Mail

Carpworld magazine

Trout and Salmon magazine

Trout Fisherman magazine

Websites

www.anglingtrust.net	The Angling Trust
www.britishwaterways.co.uk	British Waterways
www.countryside-alliance.org	The Countryside Alliance
www.environment-agency.gov.uk	The Environment Agency
www.salmon-trout.org	The Salmon and Trout Association

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	researching the geographical distribution of the different types of angling and fish species in the UK
Creative thinkers	producing a detailed list/description of the different types of angling in the UK as a result of a creative thinking and discussion session
Reflective learners	using a checklist to review practical game angling performance, identifying strengths and areas to develop using a checklist to review practical coarse angling performance, identifying strengths and areas to develop
Effective participators	participating in a discussion using personal experiences of responsibilities and activities when angling in relation to the environment, fish and wildlife.

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 the role of a local angling organisation researching the role of a national angling organisation researching the role and responsibilities of the Environment Agency
Creative thinkers	applying different techniques while game angling applying different techniques while coarse angling
Effective participators	participating in rig making workshops, tackle talks and bait workshops, sharing skills and knowledge with others.

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	
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	
ICT – Find and select information	
Select and use a variety of sources of information independently for a complex task	using the internet to research the role of a national angling organisation using the internet to research rod licences, bylaws and the role of the Environment Agency
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 written assignment on angling in the UK
Bring together information to suit content and purpose	
Present information in ways that are fit for purpose and audience	producing a leaflet for the angling code of practice
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	collecting information about their local angling club
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	

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	
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	contributing to discussions about anglers' responsibilities to wildlife, fish and the environment completing a short presentation about and demonstration of making a terminal rig for coarse angling
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	explaining the role of a local and a national angling organisation in the UK
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	completing an assignment on angling in the UK producing a leaflet or poster as a code of practice for angling.

Unit 9: Undertake Freshwater Sport Fishery Management

Unit code: J/600/9215

Level 2: BTEC First

Credit value: 10

Guided learning hours: 60

Aim and purpose

This unit aims to introduce learners to the skills and knowledge needed in freshwater sport fishery management, and how these can be applied in practice. It is designed for learners in centre-based settings looking to progress into the sector or onto further/higher education.

Unit introduction

The management of sport fisheries is of crucial importance in providing angling resources within the UK that are enjoyed by thousands of people each year. These resources enhance the environment and provide varied habitats for many species of wildlife and plants.

This unit covers the essentials of freshwater sport fishery management. Learners will cover the elementary methods of fish stock maintenance and improvement that are used in both natural and commercial game and coarse fish fisheries. Animal welfare issues will be included within this, ensuring that learners appreciate problems that arise through, for example, overstocking.

Learners will cover the management of sport fishery banks and related structures and the control of both aquatic and bank side vegetation. They will look at the methods most commonly used to catch fish within freshwater environments and at the role of rules and legislation, and the typical duties associated with working in the industry.

In order to manage a freshwater sport fishery effectively, anglers must adhere to a variety of rules and fishery managers must respect relevant, current legislation. The unit covers both of these topics along with the range of duties associated with working in the industry.

Learning outcomes

On completion of this unit a learner should:

1 Know elementary methods of fish stock maintenance and improvement

2 Be able to use suitable methods of bank maintenance and vegetation control

3 Be able to use commonly used legal methods of catching fish

4 Understand the use of rules and the duties of those employed in sport fisheries.

Unit content

1 Know elementary methods of fish stock maintenance and improvement

Types: sport fisheries in the UK eg commercial coarse fisheries, put-and-take game fisheries, catch and release fisheries, natural

Fish stocks: species, typical sizes and densities of fish stocked in natural and commercial coarse and game sport fisheries; stock prices and sources for coarse and game fish; reasons, methods and timing of stocking; legal responsibilities and relevant current legislation; reasons for de-stocking fisheries eg problems of overstocking, competition, poor recruitment, disease, parasites, water quality, poor growth; methods used to manage and enhance fish stocks eg providing cover, supplementary feeding; fish welfare

2 Be able to use suitable methods of bank maintenance and vegetation control

Maintenance and control: reasons for maintaining banks and controlling vegetation in freshwater sport fisheries; reasons for angling pegs and safe bank side access; environmental implications of bank maintenance and vegetation control eg protection of wildlife at sensitive times, pollution; access requirements for people with disabilities; needs of different angler groups in peg design

Methods: commonly used methods to maintain banks and construct angling pegs eg jetties, boardwalks, wooden platforms, slabs, concrete, hardcore; correct use of hand tools to clear and restore banks and to construct angling pegs; surface finishes for access and angling pegs; commonly used manual, biological and chemical methods of controlling aquatic and bank side vegetation; species involved; health and safety; risk assessment

3 Be able to use commonly used legal methods of catching fish

Methods of fish capture: commonly used methods of fish capture (seine net, fish traps, electric fishing apparatus, rod and line, fyke nets); advantages and disadvantages of each method; relevant current legislation; health and safety, risk assessment; Weil's Disease

4 Understand the use of rules and the duties of those employed in sport fisheries

Rules and regulations: fishery rules eg etiquette, responsibility for the environment, wildlife and property, costs and types of tickets, types of equipment, hours of fishing, catch returns; fish welfare rules for different types of coarse and game fisheries eg legal and illegal methods of fish capture, bait bans, use of keep nets; local bylaws; relevant current legislation

Duties: typical employment structures in sport fisheries; daily, weekly, seasonal and annual fishery duties (catch returns, angler and public liaison, issuing tickets, offering advice to anglers, good housekeeping. grass and vegetation control, angling reports, maintenance tasks, pest and predator control, stock surveys, stocking reviews, establishment and control of aquatic and bank side habitats, forward planning)

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 suitable species, sizes, numbers and costs of fish for a specified coarse fishery to meet given objectives [CT]	**M1**	explain how and when to stock fish in a specified coarse fishery to meet given objectives	**D1**	explain how and why fish should be managed in a specified fishery once stocked
P2	identify suitable species, sizes, numbers and costs of fish for a specified game fishery to meet given objectives [CT]	**M2**	explain how and when to stock fish in a specified game fishery to meet given objectives		
P3	correctly use hand tools whilst undertaking bank or angling peg maintenance to meet specified objectives [TW]	**M3**	explain the advantages and disadvantages of given types of angling pegs used in specified sport fisheries		
P4	correctly use hand tools whilst undertaking vegetation control to meet specified objectives [TW]	**M4**	identify bank side and aquatic plants to be controlled at a specified fishery	**D2**	explain how, why and when aquatic and bank side vegetation is controlled in a specified sport fishery
P5	list the equipment required to undertake a fish capture operation	**M5**	explain the health and safety issues associated with the use of a specified fish catching method to meet given objectives and describe how these should be managed	**D3**	explain the advantages and disadvantages of a method of fish capture for a specified situation
P6	carry out a fish capture operation [TW]				
P7	explain the requirements of the rules of a specified coarse fishery [IE]	**M6**	describe the different types of tickets available to anglers at a specified fishery.	**D4**	explain the duties of those employed in a specified sport fishery over a given period of time.
P8	explain the requirements of the rules of a specified game fishery. [IE]				

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

Tutors delivering this unit have opportunities to use as wide a range of techniques as possible. Lectures, discussions, seminar presentations, site visits, supervised sport fishery 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.

Whichever delivery methods are used, it is essential that tutors stress the importance of fish welfare, sound environmental management and the need to manage the resource in a sustainable way.

Health and safety issues relating to working in and around water must be stressed and reinforced regularly, and risk assessments must be undertaken before any practical activities.

Tutors should consider integrating the delivery, private study and assessment relating to this unit with any other relevant units and assessment instruments learners may also be taking as part of their programme of study.

Learning outcome 1 is likely to be delivered through formal lectures, discussion, site visits and independent learner research. Learners will become aware of the elementary methods of fish stock maintenance and improvement used in the freshwater sport fishery industry. Visiting expert speakers could add to the relevance of the subject for learners. For example, a sport fishery manager could talk about their work, the situations they face and the methods they use.

Learning outcome 2 covers the use of suitable methods of bank maintenance and vegetation control in sport fisheries. Delivery techniques should be varied but it would be expected that formal lectures, discussions, supervised sport fishery practicals and site visits would form part of delivery. Health and safety issues must be addressed before learners visit any freshwater sport fishery. Visiting expert speakers could add to the relevance of the subject for learners. For example, a fishery manager or Environment Agency officer could talk about their work and the methods they use.

Learning outcome 3 looks at the commonly used legal methods of catching fish used in sport fisheries. Delivery techniques should be varied but it would be expected that formal lectures, demonstrations, supervised sport fishery practicals and site visits would form part of delivery. Health and safety issues and fish welfare must be addressed before learners undertake practical work with any items of equipment. Adequate PPE must be provided and used following the production of suitable risk assessments. Visiting expert speakers could add to the relevance of the subject for the learner. For example, a sport fishery manager or Environment Agency officer could talk about their work and the methods they use.

Learning outcome 4 is likely to be delivered through a series of formal lectures, discussions and supervised sport fishery practicals. This covers the rules used in sport fisheries and the duties of those employed in the industry. Visiting expert speakers could add to the relevance of the subject for learners. For example, a coarse or trout fishery manager could talk about their work and the rules of their fisheries.

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 of planning the delivery and assessment of this unit.

Topic and suggested assignments/activities and/assessment
Introduction and overview of the unit.
Assignment 1: Stocking Fisheries (P1, P2, M1, M2,D1) Tutor introduces the assignment.
Pair internet research on coarse fish prices. Small-group work on calculating stocking densities for commercial match fishery, commercial pleasure fishery and commercial carp fishery to include species, sizes and numbers using worksheets with feedback.
Pair internet research on trout fish prices. Small-group work on calculating stocking densities for commercial trout fisheries, commercial pleasure fishery, river, reservoir and specimen water to include species, sizes and numbers using worksheets with feedback.
Visit to trout farm and commercial trout fishery to look at fish stocks and stocking.
Visit to coarse fish farm and commercial coarse fishery to look at fish stocks and stocking.
Lecture on how and when to stock coarse and trout fisheries and once stocked, how these fish should be managed. Group discussion and feedback.
Assignment 2: Angling Peg and Vegetation Control Practical (P3, P4, M3, M4, D2) Tutor introduces the assignment.
Tool identification for vegetation control to include risk assessment and safe working practices.
Small group practical on bank side vegetation control at a local fishery. Demonstration, safe use of tools, risk assessment evaluate work done.
Small group practical on aquatic vegetation control at a local fishery. Demonstration, safe use of tools, risk assessment evaluate work carried out.
Lecture and group discussion on different types of angling peg Advantages and disadvantages of different types of angling pegs, worksheets with feedback and discussion.
Lecture on aquatic plant control. Species identification, methods, times, environmental implications and reasons.
Lecture on bank side vegetation control. Species identification, methods, times, environmental implications and reasons.
Assignment 3: Practical Fish Capture Operation (P5, P6, M5, D3) Tutor introduces the assignment brief.
Short lecture on the different methods of fish capture, advantages and disadvantages of each method, reasons for undertaking fish capture operations. The Environment Agency consent process learner research and completion of forms.
Health and safety/risk assessment workshop and small-group work with feedback. Group discussion and feedback on fish welfare and environmental issues.
Fish capture practical. Whole group practical on seine netting to include planning, preparation, carry out and review work.
Fish capture practical. Whole group practical on seine netting to include planning, preparation, carry out and review work done. Increase in responsibility.
Assessment 4: Fishery Management (P7, P8, M6, D4) Tutor introduces the assignment brief.
Theory session on fishery rules and why they are needed. Pair research on fishery rules at selected coarse and game fisheries with feedback and discussion.
Lecture on game fishery rules and site visit to a commercial game fishery.
Lecture on coarse fishery rules and site visit to commercial coarse fishery.
Ticket types for coarse fisheries – pair research and feedback.
Ticket types for game fisheries – pair research and feedback.
Duties of a fishery manager. Discussion and feedback. Lecture. Visit to local fishery to talk about duties of fishery manager.

Topic and suggested assignments/activities and/assessment
Unit review.

Assessment

To achieve a pass, learners must meet the eight pass criteria listed in the Assessment and grading grid. For P1 and P2 learners will be expected to identify suitable species, sizes, number and costs of fish, for a specified coarse fishery and a specified game fishery, to meet given objectives. Tutors should identify the objectives for learners. These should be relatively straightforward at this level and tutors should use a range of situations for assessment purposes. However they should ensure assessment is fair for all learners. Learners should show that they have carried out research, for example they may have used the internet to obtain the price of stock fish. Evidence for this could take the form of a written assignment or workbook.

P3 and P4 requires learners to use hand tools correctly whilst undertaking bank or angling peg maintenance and vegetation control to meet specified objectives. Tutors should identify the specified objectives. Where possible the size and complexity of these should be the same for each learner to ensure assessment is fair. This could be assessed directly by the tutor during practical activities. If this format is used 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 Edexcel website.

P5 requires learners to select and use suitable methods of fish capture safely to meet given objectives. Tutors should identify the objectives which should be straightforward at this level. Where possible the size and complexity of these should be the same for each learner to ensure assessment is fair. Evidence may be in the same format as for P3 and P4.

P6 and P7 require learners to describe the requirements of the rules of a specified coarse fishery and a specified game fishery. Tutors could identify the fisheries themselves or in discussion with learners. Where possible the size and complexity of these should be the same for each learner to ensure assessment is fair. Learners should explain the reasons behind the rules at particular fisheries. Evidence may be in the same format as for P1 and P2.

To achieve a merit, learners must meet all the pass grade criteria and the six merit grade criteria. For M1, learners are required to explain how and when to stock fish in a specified coarse fishery and in a specified game fishery for M2 to meet given objectives. Tutors could identify the fisheries themselves or in discussion with learners. Where possible the size and complexity of the stocking objectives should be the same for each learner to ensure assessment is fair. Evidence may be in the same format as for P1 or P2.

For M3 learners must explain the advantages and disadvantages of given types of angling pegs used in specified sport fisheries. Tutors could identify the fisheries themselves or in discussion with learners. Tutors must ensure assessment is fair for all learners when identifying the number of angling peg types for assessment. The fisheries may be the same as those used to provide evidence for other criteria. Evidence may be in the same format as for P3.

For M4, learners must identify bank side and aquatic plants that need to be controlled at a specified fishery. This should include aquatic, marginal and bank side vegetation. Tutors could identify the fisheries themselves or in discussion with learners. Tutors must ensure assessment is fair for all learners when identifying the number of angling peg types for assessment. The fisheries may be the same as those used to provide evidence for other criteria. Evidence may be in the same format as for P7.

For M5, learners must explain the health and safety issues associated with the use of a specified fish catching method and describe how these should be managed. Tutors could identify the fish catching method themselves or in discussion with learners. Where possible the size and complexity of the method should be

the same for each learner to ensure assessment. The method chosen to provide evidence for this criterion may be used to provide evidence for other criteria in the unit. Evidence may be in the same format as for P5.

For M6, learners must identify and explain the different ticketing options for a specified sport fishery. Tutors could identify the fishery themselves or in discussion with learners. Where possible the size and complexity of these should be the same for each learner to ensure assessment is fair. Evidence may be in the same format as for P6 or P7.

For a distinction grade, learners must achieve all the pass and merit grade criteria and the four distinction grade criteria. For D1, learners are required to explain how fish should be managed in a specified fishery. This could cover over population, poor recruitment and competition. Tutors could identify the fishery themselves or in discussion with learners. Where possible the size and complexity of these should be the same for each learner to ensure assessment is fair. Evidence relating to how these issues could be managed within the specified fishery must be feasible. Evidence may be in the same format as for P1 or P2.

D2 requires learners to explain how, why and when aquatic and bank side vegetation is controlled in a specified sport fishery. Tutors could identify the fishery themselves or in discussion with learners. Where possible the size and complexity should be the same for each learner to ensure assessment is fair. Evidence may be in the same format as for P3 or P4.

D3 requires learners to explain the advantages and disadvantages of a method of fish capture for a specified situation. The method chosen may be one which has been used to provide evidence for other criteria in the unit. Tutors could identify the method themselves or in discussion with learners. Where possible the size and complexity should be the same for each learner to ensure assessment is fair. Evidence may be in the same format as for P5 or P6.

D4 requires learners to explain the duties of those employed in a specified sport fishery over a given period of time. Tutors should identify the fishery themselves or in discussion with learners. Where possible the size and complexity should be the same for each learner to ensure assessment is fair. The given period of time should be long enough to enable learners to show that they have understood the range of duties that employees have on a particular fishery. Evidence may be in the same format as for P7 or P8.

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 Edexcel assignments to meet local needs and resources.

Criteria covered	Assignment title	Scenario	Assessment method
P1, P2, M1, M2, D1	Stocking Fisheries	Produce a written assignment about stocking a commercial trout fishery and commercial coarse fishery both of which are one hectare in size. For each fishery you should select suitable species, numbers and sizes of fish and explain why you have chosen them. You should explain how and when these fisheries should be stocked and how the fish in one of these fisheries should be managed.	Written assignment

Criteria covered	Assignment title	Scenario	Assessment method
P3, P4, M3, M4, D2	Angling Peg Maintenance and Vegetation Control Practical	You have been given an angling peg at a local fishery. You are to undertake the relevant maintenance work on this and identify and control the surrounding vegetation. Within your work books identify the advantages and disadvantages of the different types of angling peg and explain how, and why, aquatic plants and bank side vegetation should be controlled.	Practical observation and assessment and peg work book
P5, P6, M5, D2	Practical Fish Capture Operation	As part of a team you are to net Church Pool. You are to select the equipment to be used and explain why it is required. You are to undertake a risk assessment and record this along with the work undertaken in your seine netting workbook. You are to identify the other methods of fish capture and explain the advantages and disadvantages of using each one at Church Pool.	Practical observation and assessment and seine netting work book
P7, P8, M6, D4	Managing Fisheries	Produce a written assignment about the rules required for a specified trout fishery and a specified coarse fishery and explain why they are required. For one of these fisheries describe and explain the ticketing options available to the angler. Finally, for one of the fisheries produce a season plan of duties to be undertaken over a 12-month period.	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 Environmental and Land-based sector suite. This unit has particular links with the following unit titles in the Environmental and Land-based suite:

Level 2	Level 3
Introduction to Game and Coarse Angling	Understanding Fishery Management
Undertake Work Related Experience in the Land-based Industries	Understanding Freshwater Fish Population Survey and Management
Element AgC6.2 Control unwanted vegetation	
Element Ga3.1 Maintain game populations	

Essential resources

Learners will require access to running and standing water habitats, preferably those already used as sport fisheries.

Equipment required will include the normal safety and technical equipment for use in and near water for example boats, seine nets, electro-fishing apparatus; hand nets; holding boxes, hand tools for clearing bank side vegetation, chest waders.

Tutors delivering this unit should be competent and experienced sport fishery managers. Ideally they should have recent industrial experience within the sport fishery management industry or show evidence of regular contact with the industry or technical updating.

Employer engagement and vocational contexts

This unit focuses on practical aspects of fishery management and the theory behind the daily management of commercial fisheries. It will give learners the related background knowledge and skills to be able to assist with the running of a fishery. Centres are encouraged to create and develop links with local coarse and game fisheries, fishery managers, angling clubs, angling organisations and the Environment Agency. This could be via guest lectures and visits to local fisheries. Learners could develop and apply their knowledge through their work experience unit.

Indicative reading for learners

Textbooks

Barnes R S K and Mann K H – *Fundamentals of Aquatic Ecology* (Blackwell, 1991) ISBN 0632029838

Code of Practice for Safety in Electric Fishing Operations (Environment Agency)

Environment Agency Advisory Booklets – *Fisheries habitat improvement, coarse fish biology and management, Water plants their function and management, Environments for fish*

Institute of Fisheries Management Advisory Booklet – *Key to Identifying Fish and Key to Aquatic Plants*

Institute of Fisheries Management Certificate Level Training Booklets – *Freshwater Biology, Water Quality, Bailiffing, Legal and Fisheries and Maintenance Improvement*

Maitland P S – *Keys to the Freshwater Fish of Britain and Ireland* (Freshwater Biological Association, 2004) ISBN 090038671 1

Seagrave C – *Aquatic Weed Control* (Fishing News Books, 1988) ISBN 0852381522

Templeton R G (Editor) – *Freshwater Fisheries Management* (Fishing News Books, 1995) ISBN 085238209X

Websites

www.anglingtrust.net	The Angling Trust
www.defra.gov.uk	Department for Environment, Food and Rural Affairs
www.environment-agency.gov.uk	Environment Agency
www.ifm.org.uk	Institute of Fisheries Management
www.lantra.org.uk	Sector Skills Council for the Environment and Land-based Industries

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 rules for coarse and game fisheries and researching how these can vary from fishery to fishery
Creative thinkers	selecting suitable fish for stocking both coarse and game fisheries
Team workers	working in small groups to undertake peg maintenance work working in pairs to undertake vegetation control working as part of a large team to undertake seine netting operations.

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	completing risk assessments for a fish capture operation
Creative thinkers	looking at the advantages and disadvantages of angling pegs
Reflective learners	reviewing practical works undertaken on an angling peg reflecting on a fish capture operation after the task is complete
Self-managers	taking on the role of team leader during seine netting practicals to organise the team and resources taking on the role of team leader during peg maintenance practicals to organise a small team and resources.

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	researching price lists for coarse and game fish species for stocking purposes researching fishery rules for different types of coarse and game fisheries researching angling tickets at different fisheries
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 written assignment for stocking fisheries producing a written assignment for managing fisheries presenting fish stocks in a table for both coarse and game fisheries using images from a digital camera as evidence of practical bank side maintenance and vegetation control work
Bring together information to suit content and purpose	
Present information in ways that are fit for purpose and audience	
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	
Identify the situation or problem and the mathematical methods needed to tackle it	working out stocking densities of fish for coarse and game fisheries
Select and apply a range of skills to find solutions	
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 selecting suitable fish for a fishery
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	discussing the planning of a fish capture operation
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	reading and summarising fishery rules reading and summarising fish prices
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	completing an assignment on stocking fisheries completing an assignment on managing fisheries producing a plan for netting a fishery.

Unit 10: Introduction to Caring for Ornamental Aquatics

Unit code: R/600/9363

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 care of ornamental aquatics 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

Fish are the third most popular pet group after cats and dogs, and the most populous, in the UK. This unit introduces the principles of keeping aquatic flora and fauna in aquaria and ponds and the application of this knowledge. It will enable learners to adopt safe working practices and develop a confident and adaptable approach to the management of aquatic life and the use of dry goods in preparation for employment in the aquatics industry. This unit supports this by raising learners' awareness of the different types of fish species kept in the UK. Learners will gain valuable practical experiences of setting up and maintaining both aquaria and ornamental ponds.

Learning outcomes

On completion of this unit a learner should:

1 Know the main features of the aquatics industry in the United Kingdom

2 Be able to plan and contribute to the set up of a safe, viable aquarium system

3 Be able to plan and set up a safe, viable ornamental pond

4 Be able to maintain the health of an aquarium's flora and fauna.

Unit content

1 Know the main features of the aquatics industry in the United Kingdom

Main features: sources of fish and equipment eg wholesalers, retailers, importers, dry goods suppliers, feed suppliers, markets; location and size of the UK industry; trends and factors affecting the UK industry eg number of households keeping fish, welfare issues, environmental and health issues relating to the importation of fish; major species of fish; positive and negative issues related to sourcing wild fish and invertebrates (environmental, social, ethical)

Legislation and Regulation: current relevant legislation eg Welfare of Animals in Transport Orders, Pet Animal Act 1951, Animal Welfare Act 2006, Wildlife and Countryside Act, The Importation of Live Fish Act 1980 (ILFA), The Diseases of Fish Act 1983, The Prohibition of Keeping or Release of Live Fish (Specified Species) Order 1998; Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); EU Wildlife Trade Regulations; The Aquatic Animal Health Regulations

2 Be able to plan and contribute to the set up of a safe, viable aquarium system

Planning and setting up an aquarium system: design criteria and materials used to establish an aquarium; items necessary for setting up an aquarium eg equipment, ornaments, flora and fauna; costs involved in setting up and maintaining aquaria; health and safety requirements

Safety and viability: need for and maintenance of personal hygiene when dealing with aquaria; risk assessment and dangers of working with aquaria eg electricity, water, glass, fish and UV lights; methods used to reduce health and safety risks and hazards; current relevant legislation eg Health and Safety at Work Act 1974

3 Be able to plan and set up a safe, viable ornamental pond

Planning and setting up an ornamental pond: design criteria, size and materials used to establish an ornamental fish pond; items necessary for setting up an ornamental fish pond eg equipment, ornaments, flora and fauna; health and safety; costs involved in setting up and maintaining ornamental ponds

Safety and viability: Health and Safety at Work Act 1974; need for and maintenance of personal hygiene; risk assessment and dangers of working with ornamental ponds eg electricity, water, manual handling; methods used to reduce health and safety risks and hazards

4 Be able to maintain the health of an aquarium's flora and fauna

Flora and fauna of an aquarium: importance of water quality and how to test and maintain temperature, light intensity and stocking regimes; selection of suitable communities of fish and plant species; filtration systems; feeding and impact on maintenance of health of fish and plants

Problems: potential causes of ill health eg poor water quality, parasites; strategies for prevention and/or cure of identified problems eg water change; signs of ill health in flora and fauna; treatment of ill health; regular monitoring of the aquarium environment

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 structure of the aquatics industry in the UK [IE, RL, SM]	**M1**	investigate and summarise different sources of fish and invertebrate species for use in the UK market and the impact it has on welfare	**D1**	discuss positive and negative aspects of the sourcing of wild fish and invertebrates
P2	list the common aquatic species kept in the UK [IE, RL, SM]				
P3	describe the ethical issues caused by the importation of fish into the UK				
P4	plan an aquarium to correctly maintain a given species [CT, TW, EP]	**M2**	monitor the flora and fauna, water quality, temperature and health of fish in an aquarium over a period of time, making suggestions for improvements to increase welfare	**D2**	formulate, use and evaluate a healthcare and feeding plan for given species in an ornamental pond or aquaria, taking into account legislation, health and safety and fish and invertebrate species welfare.
P5	contribute to the setting up of a safe, viable aquarium system [RL, CT, SM, EP]				
P6	plan an ornamental pond	**M3**	monitor the flora and fauna, water quality, temperature and health of fish in an ornamental pond over a period of time, making suggestions for improvements to increase welfare.		
P7	contribute to the setting up of a safe, viable ornamental fish pond [CT, TW, EP]				
P8	carry out appropriate water quality tests on a given mature aquarium [RL, CT, SM, EP]				
P9	produce a maintenance schedule for a given mature aquarium [RL, CT, IE]				
P10	carry out a health check regime for given aquarium flora and fauna.				

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 assessments and visits to suitable collections and will link to work experience placements.

Learners should be encouraged to visit retail and wholesale establishments that are used in the ornamental aquatics industry to gain a real view of what is involved. They also be encouraged to research species of particular interest to them, and the care of these species.

There are both practical and theoretical elements to the delivery of this unit, but the main emphasis at Level 2 should be on the practical aspects.

Learning outcome 1 is likely to be delivered by formal lecture, discussion, site visits and independent learner research. Learners will study the main features, trends and issues of the United Kingdom's aquatics industry. Visiting expert speakers could add to the relevance of the subject for the learner. For example, a fish importer, wholesaler, retailer or ornamental fish farmer could talk about their work and the methods they use.

Learning outcomes 2 and 3 are closely linked, covering the planning and setting up of safe, viable aquaria and ornamental fish ponds. Delivery techniques should be varied. Learners must have access to facilities where aquaria and ornamental fish ponds can be established in a safe, viable manner. Learners should visit sites where aquaria and ornamental fish ponds are already established to see the theory in practice. Formal lectures, discussions, supervised practical sessions and site visits would form part of the delivery of these outcomes. Learners will also develop knowledge and skills through work placements or by working in a centre's own fish or animal care facilities. Terminology associated with health issues should be that generally accepted on an industry basis.

Learning outcome 4 is likely to be delivered through a series of formal lectures, demonstrations and supervised practical sessions. Learners can develop knowledge and skills through work placements or by working in a centre's own fish or animal care facilities. The learner will develop observational skills and ideas as to how flora and fauna in an aquarium are cared for in an acceptable manner. Visiting expert speakers could add to the relevance of the subject for the learner. For example, a worker in an aquatics retail centre or aquarium could talk about their work and the methods they use to maintain the health of the aquatic plants and animals in their care.

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 aquatic facilities, health and safety induction.
Visits to ornamental aquatic establishments to gain knowledge and understanding/real experiences of the industry and species within it.

Topic and suggested assignments/activities and/assessment
Market structure and environmental issues affecting the fish industry.
Assignment 1: The Aquatics Industry (P1, P2, P3, M1, D1) Tutor to introduce assignment and learner-centred research.
Common flora and fauna kept within ponds and aquaria, issues around sourcing of wild fish.
Assignment 2: Aquaria (P4, P5, P8, P9, P10, M2, D2) Tutor to introduce assignment and learner-centred research.
Practical session – planning and setting up aquaria.
Risk assessments on aquaria, monitoring the aquaria, maintenance including feeding requirements and health care.
Assignment 3: Ornamental Fish Ponds (P6, P7, M3, D2) Tutor to introduce assignment and learner-centred research.
Practical session – setting up an ornamental fish pond, feeding fish and monitoring fish health and healthcare.
Risk assessments on the ornamental pond, monitoring the ornamental pond.
Unit review.

Assessment

For P1, P2 and P3, learners are required to look at the general structure, species sold and markets for the UK aquatics industry, as well as the environmental issues involved with sourcing fish and other invertebrate species. Learners could be given a case study or selection of species and then carry out market research on their friends and family, to get a real view of the fishkeeping industry in their local area and the UK as a whole. Learners should locate the sources of the species identified in their research and produce a written assignment on how the fish are sourced, issues related to sourcing fish and the impact of taking fish from the wild.

For M1, learners need to investigate and summarise alternative sources for fish and invertebrate species that are used in the UK and how this could potentially impact on their welfare. This could be extended further for D1, by learners discussing both positive and negative aspects of sourcing wild fish and invertebrates. This information could be presented as a written assignment, poster, or presentation.

For P4 and P5, learners need to plan and contribute to the setting up of a safe, viable aquarium, and identity the human health and safety risks associated with this. This would lend itself to learners developing a plan or poster of their proposed aquaria, annotated to explain each component, and contributing to setting up this aquarium once agreed with the tutor. It would be sensible for learners to work in groups for this assessment to reduce the resources needed to set up individual aquaria.

For M2, learners could develop a monitoring sheet to use with their aquarium, and monitor the flora and fauna, water quality, temperature and health of the species within the aquarium over a period of time set by the tutor (for example one month). They will need to suggest potential improvements to increase welfare, after the set time period, in a written report. To achieve D2, learners could extend this by developing a feeding and healthcare plan for the aquaria or ornamental fish pond that takes into account relevant current legislation, health and safety and welfare of the species. Learners will use this plan over a period of time (once agreed with the tutor) and evaluate its effectiveness in a written report.

For P6 and P7, learners are required to plan and contribute to setting up a safe, viable ornamental pond; evidence could be similar to that given for P4 and P5.

For P8, P9 and P10, learners are required to maintain the health and welfare of the flora and fauna in a given aquarium over a set period of time as set by the tutor. Ideally, this should be a term, to allow learners to

monitor all the changes happening in the aquarium and maintain them accordingly.

For M3, learners are required to monitor the flora, fauna, water quality, temperature, and health of fish in an ornamental fish pond over a period of time and make suggestions for improvements.

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 Edexcel assignments to meet local needs and resources.

Criteria covered	Assignment Title	Scenario	Assessment method
P1, P2, P3, M1, D1	The Aquatics Industry	You work in the aquatics department of a popular garden centre. You need to carry out market research on friends and family, as well as research on the internet/through magazines etc, to assess the market for fish keeping in the UK. You must investigate environmental issues and legislation related to care of ornamental aquatics.	Assignment.
P4, P5, P8, P9, P10, M2, D2	Aquaria	Learners are required to plan and contribute to setting up an aquarium, monitor the conditions and formulate health and feeding plans for that aquarium. They are also required to risk assess the aquaria for potential dangers.	Poster. Practical assessment. Report.
P6, P7, M3, D2	Ornamental Fish Ponds	Learners are required to plan and contribute to setting up an ornamental pond, risk assessing it and monitoring it over a period of time.	Practical assessment. 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
Undertake Work Experience in the Land-based Industries	Understand the Principles of Aquatics Husbandry and Management

Essential resources

Learners will need access to a range of fish ponds, aquaria, equipment, flora and fauna. They also need to be able to set up fish ponds and equipment, although this does not have to be individual and can be carried out in groups to reduce the amount of resources needed. Learners should have access to computers, the internet and a well-stocked library on fish and fish keeping.

Employer engagement and vocational contexts

The centre should forge links with local fish keepers, wholesalers and aquaria to enable learners to visit or engage with guest lecturers.

Learners can be introduced to a variety of professionals from different companies and organisations such as vets, RSPCA, animal care representatives, breeders etc to broaden their depth of knowledge and make the learning experience interesting and contextualised. This could be either guest lectures or off site visits to different establishments. All sites should be checked for health and safety before any visits.

Indicative reading for learners

Textbooks

Andrews C, Excell A and Carrington N – *The Interpet Manual of Fish Health* (Interpet publishing, 2001) ISBN 9781842860670

Axelrod H R, Benoist A S and Kelsey-Wood D T – *The Atlas of Garden Ponds* (TFH Publications, 1992) ISBN 9780866223430

Howells G – *Water Quality for Freshwater Fish* (Taylor and Francis, 1993) ISBN 9782881249228

Moe M – *The Marine Aquarium Handbook: Beginner to Breeder* (Green Turtle Publications, 1992) ISBN 9780939960071

Websites

www.defra.gov.uk	Department of Environment, Farming and Rural Affairs
www.efishbusiness.co.uk	E Fish Business
www.environment-agency.gov.uk	Environment Agency
www.ornamentalfish.org	Ornamental Aquatic Trade Association

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 the structure of the UK aquatics industry, and outlining and researching environmental issues associated with sourcing fish from the wild
Creative thinkers	planning and setting up an aquarium or ornamental fish pond, identifying risks and hazards, planning for feeding of species and maintaining the health of an aquarium
Reflective learners	describing the structure of the UK aquatics industry, and outlining and researching environmental issues associated with sourcing fish from the wild, identifying risks and hazards, planning for feeding of species and maintaining the health of an aquarium
Team workers	planning and setting up an aquarium or ornamental fish pond
Self-managers	describing the structure of the UK aquatics industry, and outlining and researching environmental issues associated with sourcing fish from the wild, identifying risks and hazards, maintaining the health of an aquarium
Effective participators	planning and setting up an aquarium or ornamental fish pond, identifying risks and hazards and maintaining the health of an aquarium.

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	planning and carrying out research activities related to aquaria and ornamental fish ponds analysing information on alternative ways of setting up and maintaining aquaria and ornamental fish ponds
Creative thinkers	asking questions to extend their thinking during lectures and practical sessions trying out alternatives or new ways of setting up aquaria and ornamental fish ponds adapting ideas as circumstances change eg new equipment, new nutritional information, new technology
Reflective learners	identifying opportunities for identifying their own achievements setting goals for themselves to achieve eg conquering a fear of handling an animal reviewing progress in practical tasks and coursework
Team workers	working with others to carry out practical tasks and group activities in class reaching clear agreements regarding who is carrying out which task working together when setting up or planning aquaria and ornamental ponds
Self-managers	showing initiative and commitment to fish and their needs dealing with pressures of an ill animal or unbalanced aquaria managing emotions when it comes to fish welfare and healthcare

Skill	When learners are …
Effective participators	discussing issues of concern when setting up or monitoring aquaria and ornamental ponds identifying improvements to current set ups influencing others in their health and monitoring regimes and standards.

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	encouraging learners to complete their coursework using ICT facilities, using Smartboards and PCs in class, using interactive materials for teaching and learning, researching subjects on the internet
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	
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	
Bring together information to suit content and purpose	
Present information in ways that are fit for purpose and audience	
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	using mathematics to suggest dosage of supplements per size of aquarium

Skill	When learners are …
Identify the situation or problem and the mathematical methods needed to tackle it	
Select and apply a range of skills to find solutions	
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	
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	reading material on the subject from a variety of sources for their assignment work. The learners should be encouraged to read around subjects and produce clear and concise documents using correct fish health terminology for the unit learners may also be required to present information to a group of people for the unit, and this should ideally be done in a classroom situation with their peers.
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	

Further information

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

Useful publications

Further copies of this document and related publications can be obtained by contacting us:

Telephone: 0845 172 0205
Email: publications@linney.com

Related information and publications include:

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

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

Lantra
Lantra House
Stoneleigh Park
Coventry CV8 2LG

Telephone: 0845 707 8007
Email: connect@lantra.co.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.

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The training we provide:

- is active – ideas are developed and applied
- is designed to be supportive and thought provoking
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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	Edexcel Level 3 Diploma in Environmental and Land-based Studies	Pearson BTEC Level 3 Certificates, Subsidiary Diplomas, Diploma and Extended Diplomas in Fish Husbandry, Animal Management, Blacksmithing and Metalworking, Countryside Management, Fish Management, Floristry, Forestry and Arboriculture, Horse Management, Horticulture, Land-based Technology		Work Based Diploma Environmental Conservation
2	Edexcel 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		Work Based Diploma Environmental Conservation

Level	General qualifications	BTEC full vocationally-related qualifications	BTEC Short Courses	NVQ/occupational
1	Edexcel Level 1 Diploma in Environmental and Land-based Studies	BTEC Foundation Learning in Land-based Studies		
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.

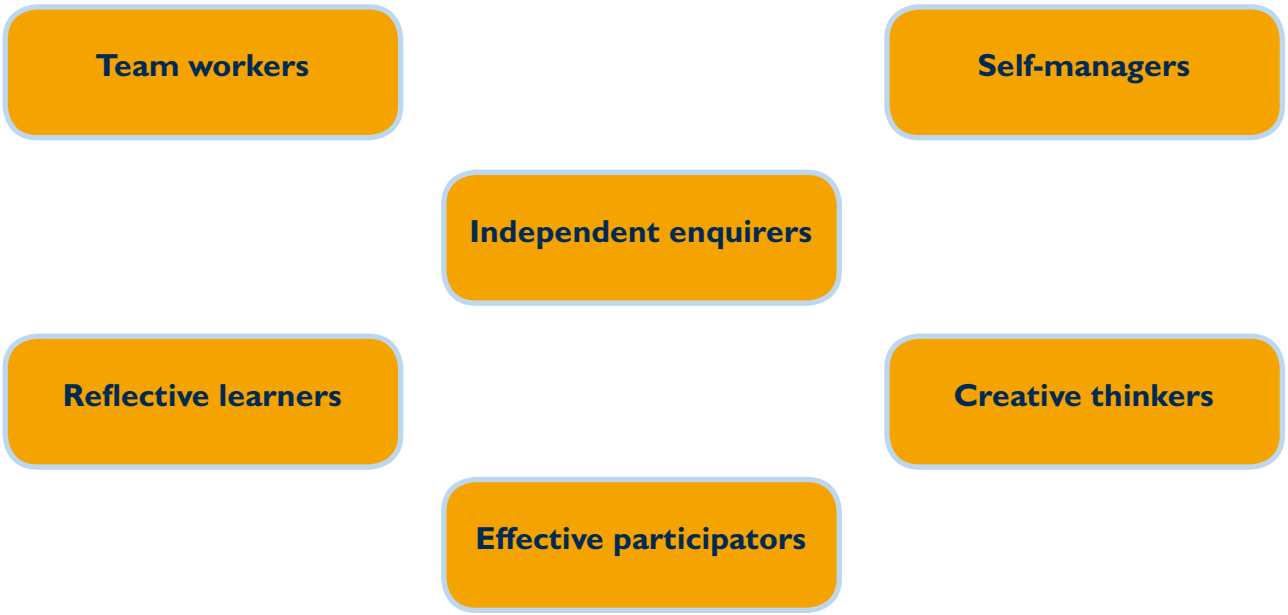
Grading domain 3	Indicative characteristics – merit	Indicative characteristics – distinction
Personal development for occupational roles (Any learning outcome stem)	• Takes responsibility in planning and undertaking activities. • Reviews own development needs. • Finds and uses relevant information sources. • 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	9	10
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 Fish Husbandry 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 Fish Husbandry makes a positive contribution to wider curricular areas as appropriate.

Spiritual, moral, ethical, social and cultural issues

The qualification contributes to an understanding of:

- spiritual issues – for example moral and ethical issues involved in conservation of the natural environment, flora and fauna
- social and cultural issues – for example issues around food production and ecosystems.

Citizenship issues

Learners undertaking the Pearson BTEC Level 2 Firsts in Fish Husbandry will have the opportunity to develop their understanding of citizenship issues, for example public and private involvement in game and fishery sports.

Environmental issues

Learners undertaking the Pearson BTEC Level 2 Firsts in Fish Husbandry 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 Fish Husbandry applies throughout Europe even though delivery is in a UK context.

Health and safety considerations

The Pearson BTEC Level 2 Firsts in Fish Husbandry 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 Fish Husbandry.

Wider curriculum mapping

Level 2

	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7	Unit 8	Unit 9	Unit 10
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 Fish Husbandry against the underpinning knowledge of the Level 2 NVQ in Fisheries Management, Level 2 NVQ in Gamekeeping and Wildlife Management and Level 2 NVQ in Agricultural Crop 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**
Level 2 NVQ in Fisheries Management										
FiM1							#			
FiM2							#			
FiM3							#			
FiM4							#			
Level 2 NVQ in Gamekeeping and Wildlife Management										
Ga3.1									#	
Level 2 NVQ in Agricultural Crop Production										
AgC6.2									#	

Annexe F

Unit mapping overview

BTEC First in Fish Husbandry legacy (specification end date 31/08/2010)/new versions of the BTEC First qualifications in Fish Husbandry (specification start date 01/09/2010) – the BTEC Level 2 Certificate in Fish Husbandry, BTEC Level 2 Extended Certificate in Fish Husbandry and the BTEC Level 2 Diploma in Fish Husbandry.

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 1	F									
Unit 2		P								
Unit 3			P	P						
Unit 4					F					
Unit 5						F				
Unit 6							F			
Unit 7								F		
Unit 8									F	
Unit 9										
Unit 10										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))

Unit mapping in depth

BTEC First in Fish Husbandry legacy (specification end date 31/08/2010)/new versions of the BTEC First qualifications in Fish Husbandry (specification start date 01/09/2010) – the BTEC Level 2 Certificate in Fish Husbandry, BTEC Level 2 Extended Certificate in Fish Husbandry and the BTEC Level 2 Diploma in Fish Husbandry.

New units		Old units		Mapping/comments (new topics in italics)
Number	**Name**	**Number**	**Name**	
Unit 1	Undertake Work Related Experience in the Land-based Industries	**Unit 1**	Work Related Experience in the Fish Industry	Purpose and structure of a business organisation removed from unit. Focus on undertaking and documenting work experience. *Be able to use relevant documents and skills relating to work experience.* *Be able to plan and review self-development during work experience.* *Be able to report on the work experience.*
Unit 2	Environmental and land-based Business	**Unit 2**	Fish Industry and Organisations	Principles of sustainable development removed from unit. Focus on business operations and administration. *Common business operations.* *Carrying out simple administrative tasks.*
Unit 3	Introduction to Fish Health	**Unit 3**	Fish Biology and Health	Identification of fresh water fish commonly found in the British Isles and understanding elementary fish biology removed from unit. Focus of unit on fish health.
Unit 4	Introduction to Fish Biology	**Unit 3**	Fish Biology and Health	Ability to perform routine examination of fish and collect key data removed from unit. Know how fish health can be maintained removed from unit. Focus of unit on fish biology.
Unit 5	Introduction to Aquatic Ecology	**Unit 4**	Introduction to Aquatic Ecology	N/A

New units		Old units		Mapping/comments (new topics in italics)
Number	**Name**	**Number**	**Name**	
Unit 6	Participate in Providing Estate Maintenance	**Unit 5**	Practical Land-based Skills	The unit provides more focus towards maintenance. *How to work safely and minimise environmental damage.*
Unit 7	Introduction to Fish Farming	**Unit 6**	Fish Farming	N/A
Unit 8	Introduction to Game and Coarse Angling	**Unit 7**	Game and Coarse Angling in the United Kingdom	N/A
Unit 9	Undertake Freshwater Sport Fishery Management	**Unit 8**	Freshwater Sport Fishery Management	N/A
Unit 10	Introduction to Caring for Ornamental Aquatics	**Unit 10**	Handling and Care of Ornamental Aquatics	N/A

Annexe G

Examples of calculation of qualification grade above pass grade

Edexcel 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 QCF 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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