Pearson BTEC

Pearson BTEC Level 3 National Foundation Diploma in Horticulture

Specification

First teaching from January 2019

First certification from 2020

Issue 4

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First teaching September 2019

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Edexcel, BTEC and LCCI qualifications

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This specification is Issue 4. We will inform centres of any changes to this issue. The latest issue can be found on our website.

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ISBN 978 1 446 94670 1

Welcome

With a track record built over 30 years of learner success, BTEC Nationals are widely recognised by industry and higher education as the signature vocational qualification at Level 3. They provide progression to the workplace either directly or via study at a higher level. Proof comes from YouGov research, which shows that 62% of large companies have recruited employees with BTEC qualifications. What's more, well over 100,000 BTEC students apply to UK universities every year and their BTEC Nationals are accepted by over 150 UK universities and higher education institutes for relevant degree programmes either on their own or in combination with A Levels.

Why are BTECs so successful?

BTECs embody a fundamentally learner-centred approach to the curriculum, with a flexible, unit-based structure and knowledge applied in project-based assessments. They focus on the holistic development of the practical, interpersonal and thinking skills required to be able to succeed in employment and higher education.

When creating the BTEC Nationals in this suite, we worked with many employers, higher education providers, colleges and schools to ensure that their needs are met. Employers are looking for recruits with a thorough grounding in the latest industry requirements and work-ready skills such as teamwork. Higher education needs students who have experience of research, extended writing and meeting deadlines.

We have addressed these requirements with:

- a range of BTEC sizes, each with a clear purpose, so there is something to suit each learner's choice of study programme and progression plans
- refreshed content that is closely aligned with employers' and higher education needs for a skilled future workforce
- assessments and projects chosen to help learners progress to the next stage. This means some are set by you to meet local needs, while others are set and marked by Pearson so that there is a core of skills and understanding that is common to all learners. For example, a written test can be used to check that learners are confident in using technical knowledge to carry out a certain job.

We are providing a wealth of support, both resources and people, to ensure that learners and their teachers have the best possible experience during their course. See *Section 10* for details of the support we offer.

A word to learners

Today's BTEC Nationals are demanding, as you would expect of the most respected applied learning qualification in the UK. You will have to choose and complete a range of units, be organised, take some assessments that we will set and mark, and keep a portfolio of your assignments. But you can feel proud to achieve a BTEC because, whatever your plans in life – whether you decide to study further, go on to work or an apprenticeship, or set up your own business – your BTEC National will be your passport to success in the next stage of your life.

Good luck, and we hope you enjoy your course.

Collaborative development

Students completing their BTEC Nationals in Horticulture will be aiming to go on to employment, often via the stepping stone of higher education. It was, therefore, essential that we developed these qualifications in close collaboration with experts from professional bodies, businesses and universities, and with the providers who will be delivering the qualifications. To ensure that the content meets providers' needs and provides high-quality preparation for progression, we engaged experts. We are very grateful to all the university and further education lecturers, teachers, employers, professional body representatives and other individuals who have generously shared their time and expertise to help us develop these new qualifications.

Employers, universities, professional bodies and businesses have provided letters of support confirming that these qualifications meet their entry requirements. These letters can be viewed on our website.

Summary of Pearson BTEC Level 3 National Foundation Diploma in Horticulture specification Issue 4 changes

Summary of changes made between the previous issue and this current issue	Page number
The last paragraph of the *Qualification and unit content* section has been amended to allow centres delivering the qualification above to alter the content to reflect the context of the country where it is being delivered.	Page 7

If you need further information on these changes or what they mean, contact us via our website at: qualifications.pearson.com/en/support/contact-us.html.

Contents

Introduction to BTEC National qualifications for the horticulture sector

This specification contains the information you need to deliver the Pearson BTEC Level 3 National Foundation Diploma in Horticulture. The specification signposts you to additional handbooks and policies. It includes all the units for this qualification.

This qualification is part of the suite of horticulture qualifications offered by Pearson. In the suite there are qualifications that focus on different progression routes, allowing learners to choose the one best suited to their aspirations.

All qualifications in the suite share some common units and assessments, allowing learners some flexibility in moving between qualifications where they wish to select a more specific progression route. The qualification titles are given below.

Within this suite are BTEC National qualifications for post-16 learners wishing to specialise in a specific industry, occupation or occupational group. The qualifications give learners specialist knowledge and technical skills, enabling entry to an apprenticeship or other employment, or progression to related higher education courses. Learners taking these qualifications must have a significant level of employer involvement in their programmes.

In the horticulture sector these are:

Pearson BTEC Level 3 National Extended Certificate in Horticulture (603/1214/2)

Pearson BTEC Level 3 National Foundation Diploma in Horticulture (603/1215/4)

Pearson BTEC Level 3 National Diploma in Horticulture (603/2675/X)

Pearson BTEC Level 3 National Extended Diploma in Horticulture (603/2679/7).

This specification signposts all the other essential documents and support that you need as a centre in order to deliver, assess and administer the qualification, including the staff development required. A summary of all essential documents is given in *Section 7*. Information on how we can support you with this qualification is given in *Section 10*.

The information in this specification is correct at the time of publication.

Total Qualification Time

For all regulated qualifications, Pearson specifies a total number of hours that it is estimated learners will require to complete and show achievement for the qualification: this is the Total Qualification Time (TQT). Within TQT, Pearson identifies the number of Guided Learning Hours (GLH) that we estimate a centre delivering the qualification might provide. Guided learning means activities, such as lessons, tutorials, online instruction, supervised study and giving feedback on performance, that directly involve teachers and assessors in teaching, supervising and invigilating learners. Guided learning includes the time required for learners to complete external assessment under examination or supervised conditions.

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

BTEC Nationals have been designed around the number of hours of guided learning expected. Each unit in the qualification has a GLH value of 60, 90 or 120. There is then a total GLH value for the qualification.

Each qualification has a TQT value. This may vary within sectors and across the suite depending on the nature of the units in each qualification and the expected time for other required learning.

The following table show all the qualifications in this sector and their GLH and TQT values.

Qualifications, sizes and purposes at a glance

Title	Size and structure	Summary purpose
Pearson BTEC Level 3 National Extended Certificate in Horticulture	360 GLH (565 TQT) Equivalent in size to one A Level. Five units of which four are mandatory and one is external. Mandatory content (83%). External assessment (33%).	This qualification offers an engaging programme to support learners who want to pursue a career in the horticulture sector. It is intended as a Tech Level qualification. This size of qualification allows learners to study related and complementary qualifications alongside it, without duplication of content. The qualification can prepare learners for a range of apprenticeships in horticulture sector, or direct entry to roles such as trainee groundskeeper or ground maintenance operative. When taken alongside further Level 3 qualifications, it supports progression to a range of higher education courses in horticulture.
Pearson BTEC Level 3 National Foundation Diploma in Horticulture	540 GLH (890 TQT) Equivalent in size to 1.5 A Levels. Seven units of which five are mandatory and two are external. Mandatory content (78%). External assessment (44%).	This qualification is designed as a one-year, full-time course, or as part of a two-year, full-time study programme for learners who want to take it alongside another area of complementary study. It is intended as a Tech Level qualification and supports progression to careers in the horticulture sector. This qualification is primarily for learners who are intending to gain employment directly, in roles such as groundskeeper or garden centre assistant, but can also be used to progress to an apprenticeship or a higher education course in horticulture.
Pearson BTEC Level 3 National Diploma in Horticulture	720 GLH (1100 TQT) Equivalent in size to two A Levels. Ten units of which eight are Mandatory and two are external. Mandatory content (83%). External assessment (33%).	This qualification is designed to be the substantive part of a 16–19 study programme for learners who want a strong core of sector study. It is intended as a Tech Level qualification and supports progression to careers in the horticultural management sector. The qualification is an introduction to the sector and is primarily for learners who are intending to gain employment directly in roles such as gardener, groundskeeper or landscape team leader. When taken alongside further Level 3 qualifications, it supports progression to a range of higher education courses in horticulture or horticultural sciences.

Title	Size and structure	Summary purpose
Pearson BTEC National Extended Diploma in Horticulture	1080 GLH (1570 TQT) Equivalent in size to three A Levels. Fifteen units of which ten are Mandatory and three are external. Mandatory content (72%). External assessment (33%).	This qualification is a two-year, full-time course for post-16 learners and is intended as a Tech Level qualification. It is designed for learners who want to focus their studies on the horticulture sector, with a firm intention of progressing to employment in one of the horticultural management or specialist roles available. The qualification also supports progression for those learners who intend to further their studies in higher education.

Learners must not register on the BTEC Level 3 Nationals in Agriculture, Countryside Management or Forestry and Arboriculture at the same time as the BTEC Level 3 Nationals in Horticulture owing to the overlap of content and assessment.

Structures of the qualifications at a glance

This table shows all the units and the qualifications to which they contribute. The full structure for this Pearson BTEC Level 3 National in Horticulture is shown in *Section 2*. **You must refer to the full structure to select units and plan your programme.**

Key

	Unit assessed externally	M	Mandatory units	O	Optional units

Unit (number and title)	Unit size (GLH)	Extended Certificate (360 GLH)	Foundation Diploma (540 GLH)	Diploma (720 GLH)	Extended Diploma (1080 GLH)
1 Professional Working Responsibilities	120	M	M	M	M
2 Plant and Soil Science	120		M	M	M
3 Contemporary Issues in the Land-based Sectors	120				M
4 Work Experience in the Land-based Sectors	60	M	M	M	M
5 Estate Skills	60	O	O	M	O
6 Identification, Planting and Care of Plants	60	M	M	M	M
7 Routine Plant Management	60		M	M	M
8 Plant Propagation Activites	60	M	O	M	M
9 Tree and Shrub Pruning and Maintenance	60	O	O	O	M
10 Land-based Machinery Operations	60		O	O	O
11 Nursery Stock Production	60	O	O	O	O
12 Maintenance of Sports and Amenity Turf	60	O	O	O	O
13 Pests and Disease in Plants	60		O	O	O
14 Identification, Planting and Care of Trees	60		O	O	O
15 Developing a Land-based Enterprise	60		O	O	O
16 Participating in Horticultural Tasks at Events	60			M	M
17 Resource and Operations Planning for Event-based Horticultural Activities	60				M
18 Maintaining the Health and Quality of Turf in Parks and Gardens	60			O	O
19 Protected Horticultural Crop Production	60			O	O
20 Outdoor Horticultural Crop Production	60			O	O

continued

Unit (number and title)	Unit size (GLH)	Extended Certificate (360 GLH)	Foundation Diploma (540 GLH)	Diploma (720 GLH)	Extended Diploma (1080 GLH)
21 Zoological Horticulture	**60**			**O**	**O**
22 Wildlife Ecology and Conservation Management	**60**			**O**	**O**
23 History of Landscape and Garden Design	**60**			**O**	**O**
24 Landscape and Garden Design	**60**			**O**	**O**
25 Constructing Decorative Landscape Features	**60**			**O**	**O**
26 Linear and Level Surveying	**60**			**O**	**O**
27 Computer-aided Design in Horticulture	**60**				**O**

Qualification and unit content

Pearson has developed the content of the new BTEC Nationals in collaboration with employers and representatives from higher education and relevant professional bodies. In this way, we have ensured that content is up to date and that it includes the knowledge, understanding, skills and attributes required in the sector.

Each qualification in the suite has its own purpose. The mandatory content provides a balance of breadth and depth ensuring that all learners have a strong basis for developing technical skills required in the sector. Learners are then offered the opportunity to develop a range of technical skills and attributes expected by employers with some opportunity to select between optional units where a degree of choice for individual learners to study content relevant to their own progression choices is appropriate. It is expected that learners will apply their learning in relevant employment and sector contexts during delivery and have opportunities to engage meaningfully with employers.

The proportion of mandatory content ensures that all learners are following a coherent programme of study and acquiring the knowledge, understanding and skills that will be recognised and valued. Learners are expected to show achievement across mandatory units as detailed in *Section 2*.

BTEC Nationals have always required applied learning that brings together knowledge and understanding (the cognitive domain) with practical and technical skills (the psychomotor domain). This is achieved through learners performing vocational tasks that encourage the development of appropriate vocational behaviours (the affective domain) and transferable skills. Transferable skills are those such as communication, teamwork, planning and completing tasks to high standards, which are valued in both the workplace and in higher education.

Our approach provides rigour and balance, and promotes the ability to apply learning immediately in new contexts. Further details can be found in *Section 2*.

Centres should ensure that delivery of content is kept up to date. Some of the units within the specification may contain references to legislation, policies, regulations and organisations, which may not be applicable in the country you deliver this qualification in (if teaching outside of England), or which may have gone out-of-date during the lifespan of the specification. In these instances, it is possible to substitute such references with ones that are current and applicable in the country you deliver subject to confirmation by your Standards Verifier.

Assessment

Assessment is specifically designed to fit the purpose and objective of the qualification. It includes a range of assessment types and styles suited to vocational qualifications in the sector. There are three main forms of assessment that you need to be aware of: external, internal and synoptic.

Externally-assessed units

Each external assessment for a BTEC National is linked to a specific unit. All of the units developed for external assessment are of 120 GLH to allow learners to demonstrate breadth and depth of achievement. Each assessment is taken under specified conditions, then marked by Pearson and a grade awarded. Learners are permitted to resit external assessments during their programme. You should refer to our website for current policy information on permitted retakes.

The styles of external assessment used for qualifications in the horticulture suite are:

- examinations – all learners take the same assessment at the same time, normally with a written outcome
- set tasks – learners take the assessment during a defined window and demonstrate understanding through completion of a vocational task.

Some external assessments include a period of preparation using set information. External assessments are available twice a year. For detailed information on the external assessments please see the table in *Section 2*. For further information on preparing for external assessment see *Section 5*.

Internally-assessed units

Most units in the sector are internally assessed and subject to external standards verification. This means that you set and assess the assignments that provide the final summative assessment of each unit, using the examples and support that Pearson provides. Before you assess you will need to become an approved centre, if you are not one already. You will need to prepare to assess using the guidance in *Section 6*.

In line with the requirements and guidance for internal assessment, you select the most appropriate assessment styles according to the learning set out in the unit. This ensures that learners are assessed using a variety of styles to help them develop a broad range of transferable skills. Learners could be given opportunities to:

- demonstrate practical and technical skills using appropriate tools, equipment and processes
- complete realistic tasks to meet specific briefs or particular purposes
- write up the findings of their own research
- use case studies to explore complex or unfamiliar situations
- carry out projects for which they have choice over the direction and outcomes.

You will make grading decisions based on the requirements and supporting guidance given in the units. Learners may not make repeated submissions of assignment evidence. For further information see *Section 6*.

Synoptic assessment

Synoptic assessment requires learners to demonstrate that they can identify and use effectively, in an integrated way, an appropriate selection of skills, techniques, concepts, theories and knowledge from across the whole sector as relevant to a key task. BTEC learning has always encouraged learners to apply their learning in realistic contexts using scenarios and realistic activities that will permit learners to draw on and apply their learning. For these qualifications we have formally identified units which contain a synoptic assessment task. Synoptic assessment must take place after the teaching and learning of other mandatory units in order for learners to be able to draw from the full range of content. The synoptic assessment gives learners an opportunity to independently select and apply learning from across their programmes in the completion of a vocational task. Synoptic tasks may be in internally or externally assessed units. The particular unit that contains the synoptic tasks for this qualification is shown in the structure in *Section 2*.

Language of assessment

Assessment of the internal and external units for these qualifications will be available in English. All learner work must be in English. A learner taking the qualifications may be assessed in British or Irish Sign Language where it is permitted for the purpose of reasonable adjustment. For information on reasonable adjustments see *Section 7*.

Grading for units and qualifications

Achievement in the qualification requires a demonstration of depth of study in each unit, assured acquisition of a range of practical skills required for employment or progression to higher education, and successful development of transferable skills. Learners achieving a qualification will have achieved across mandatory units including external and synoptic assessment.

Units are assessed using a grading scale of Distinction (D), Merit (M), Pass (P), Near Pass (N) and Unclassified (U). The grade of Near Pass is used for externally-assessed units only. All mandatory and optional units contribute proportionately to the overall qualification grade, for example a unit of 120 GLH will contribute double that of a 60 GLH unit.

Qualifications in the suite are graded using a scale of P to D*, **or** PP to D*D*, **or** PPP to D*D*D*. Please see *Section 9* for more details. The relationship between qualification grading scales and unit grades will be subject to regular review as part of Pearson's standards monitoring processes on the basis of learner performance and in consultation with key users of the qualification.

UCAS Tariff points

The BTEC Nationals attract UCAS points. Please go to the UCAS website for full details of the points allocated.

1 Qualification purpose

Pearson BTEC Level 3 National Foundation Diploma in Horticulture

In this section you will find information on the purpose of this qualification and how its design meets that purpose through the qualification objective and structure. We publish a full 'Statement of Purpose' for each qualification on our website. These statements are designed to guide you and potential learners to make the most appropriate choice about the size of qualification suitable at recruitment.

Who is this qualification for?

The Pearson BTEC Level 3 National Foundation Diploma in Horticulture is intended as a Tech Level qualification, equivalent in size to 1.5 A Levels and, as such, is designed to meet the Tech Bacc measure, if studied alongside level 3 mathematics and the Extended Project Qualification (EPQ).

It is a one-year full-time course that provides a comprehensive introduction to the sector and is primarily for those intending to gain employment directly, or to progress to an apprenticeship or a higher-level horticulture qualification.

No prior study of the sector is needed, but learners should normally have a range of achievement at level 2, in GCSEs or equivalent qualifications, including English, mathematics and science.

What does this qualification cover?

The content of this qualification has been developed in consultation with employers and professional bodies to ensure that the content is appropriate for those interested in working in the sector. In addition, higher education representatives have been involved to ensure that it fully supports entry to the relevant range of specialist degrees.

The qualification develops the knowledge, understanding and skills that provide an excellent basis for employment or for further study.

There are five mandatory units, which cover the following aspects of horticulture:

- professional working responsibilities
- plant and soil science
- work experience in the land-based sectors
- identification, planting and care of plants
- routine plant management.

Learners will be able to add two optional units to the mandatory content. The optional units have been designed to support progression to a range of employment opportunities in the horticulture sector and, when taken alongside other level 3 qualifications, to a range of higher education courses.

Optional units will introduce learners to a sector-specialist area of their choice, including working in particular environments, and link with relevant occupational areas. The optional units cover areas such as:

- plant propagation activities
- tree and shrub pruning and maintenance
- land-based machinery operations
- estate skills
- nursery stock production
- sports and amenity turf areas
- plant pests and disease
- identification, planting and care of trees
- developing a land-based enterprise.

While taking this qualification, learners will be required to engage with sector employers as part of their course, including 150 hours of work experience with an employer in the sector, where they will be given opportunities to develop practical skills in preparation for employment.

What could this qualification lead to?

This qualification will prepare learners for direct employment in support roles in the horticulture sector, for example:

- gardener
- assistant groundskeeper
- assistant groundsperson.

If taken alongside an additional qualification such as a Pearson BTEC Level 3 Foundation Diploma in Business, it may support entry to administrative roles or assistant roles in management within the horticultural sector.

If learners take additional level 3 qualifications, they could increase their professional industry skills and competencies, and have increased responsibilities in the above job roles. Additional qualifications include an:

- RHS Level 3 Certificate in Practical Horticulture
- RHS Level 3 Certificate in the Principles of Plant Growth, Health and Applied Propagation
- RHS Level 3 Certificate in Principles of Garden Planning, Construction and Planting
- RHS Level 3 Diploma in Principles and Practices in Horticulture.

If learners are seeking direct employment, other qualifications that complement this qualification are an:

- Advanced Certificate in Horticulture (Crops)
- Advanced Certificate in Horticulture (Grounds Maintenance)
- Advanced Certificate in Horticulture (Ornamental Horticulture).

When achieved alongside other level 3 qualifications as part of a two-year programme of study, learners will be able to progress to a range of degree programmes in the horticulture sector.

The qualification is recognised by higher education providers as contributing to meeting admission requirements to many relevant courses. For example, if taken alongside AS/A Levels in biology and chemistry, it could lead to a:

- BSc (Hons) in Horticulture
- BSc (Hons) in Horticulture Landscape Management
- FdSc in Garden Management.

You should always check the entry requirements for degree programmes at specific higher education providers.

How does the qualification provide employability and technical skills?

In the BTEC National units there are opportunities during the teaching and learning phase to give learners practice in developing employability skills. Where employability skills are referred to in this specification, we are generally referring to skills in the following three main categories:

- **cognitive and problem-solving skills:** using critical thinking, approaching non-routine problems applying expert and creative solutions, using systems and technology
- **interpersonal skills:** communicating, working collaboratively, negotiating and influencing, self-presentation
- **intrapersonal skills:** self-management, adaptability and resilience, self-monitoring and development.

There are also specific requirements in some units for assessment of these skills where relevant, for example, where learners are required to undertake real or simulated activities.

Many of the mandatory and specified optional units encourage learners to develop the specific practical skills that employers are looking for.

How does the qualification provide transferable knowledge and skills for higher education?

All BTEC Nationals provide transferable knowledge and skills that prepare learners for progression to university or other higher study either immediately or for career progression. The transferable skills that universities value include:

- the ability to learn independently
- the ability to research actively and methodically
- being able to give presentations and be active group members.

BTEC learners can also benefit from opportunities for deep learning where they are able to make connections among units and select areas of interest for detailed study. BTEC Nationals provide a vocational context in which learners can become prepared for lifelong learning through:

- reading technical texts
- effective writing
- analytical skills
- creative development
- preparation for assessment methods used in degrees.

2 Structure

Qualification structure

Pearson BTEC Level 3 National Foundation Diploma in Horticulture

Mandatory units

There are five mandatory units, two external and three internal. Learners must complete and achieve at Near Pass grade or above all mandatory external units. Learners must complete and achieve a Pass or above in all mandatory internal units in Group A. Learners must complete the unit in group B.

Optional units

Learners must complete at least two optional units.

Pearson BTEC Level 3 National Foundation Diploma in Horticulture				
Unit number	**Unit title**	**GLH**	**Type**	**How assessed**
	Mandatory units group A – learners complete and achieve all units			
1	Professional Working Responsibilities	**120**	**Mandatory**	External
2	Plant and Soil Science	**120**	**Mandatory**	External
6	Identification, Planting and Care of Plants	**60**	**Mandatory**	Internal
7	Routine Plant Management	**60**	**Mandatory and Synoptic**	Internal
	Mandatory units group B – learners complete this unit			
4	Work Experience in the Land-based Sectors	**60**	**Mandatory**	Internal
	Optional units group C – learners complete two units			
5	Estate Skills	**60**	**Optional**	Internal
8	Plant Propagation Activities	**60**	**Optional**	Internal
9	Tree and Shrub Pruning and Maintenance	**60**	**Optional**	Internal
10	Land-based Machinery Operations	**60**	**Optional**	Internal
11	Nursery Stock Production	**60**	**Optional**	Internal
12	Maintenance of Sports and Amenity Turf	**60**	**Optional**	Internal
13	Pests and Disease in Plants	**60**	**Optional**	Internal
14	Identification, Planting and Care of Trees	**60**	**Optional**	Internal
15	Developing a Land-based Enterprise	**60**	**Optional**	Internal

External assessment

This is a summary of the type and availability of external assessment, which is of units making up 44% of the total qualification GLH. See *Section 5* and the units and sample assessment materials for more information.

Unit	Type	Availability
Unit 1: Professional Working Responsibilities	• A task set and marked by Pearson and completed under supervised conditions. • The supervised assessment is 3 hours in a specified session timetabled by Pearson. • Written submission of evidence. • 60 marks.	**Jan and May/June** **First assessment January 2020**
Unit 2: Plant and Soil Science	• A written examination set and marked by Pearson. • 1 hour 30 minutes. • Written submission. • 80 marks.	**Jan and May/June** **First assessment January 2020**

Synoptic assessment

The mandatory synoptic assessment requires learners to apply learning from across the qualification to the completion of defined vocational tasks. Across the assessment for *Unit 7: Routine Plant Management*, learners complete tasks to cultivate, grow and maintain a selection of plants, demonstrating their skills and understanding of their planting and growing requirements.

Learners approach the task having completed study and skills development relating to professional working practice, personal welfare and their responsibilities when working in the land-based sector in *Unit 1: Professional Working Responsibilities*; plant structures, systemic processes, and nutrition and soil composition and management *in Unit 2: Plant and Soil Science*; selection, planting and initial aftercare of plants in *Unit 6: Identification, Planting and Care of Plants*.

Additionally, learners will have completed *Unit 4: Work Experience in the Land-based Sectors*, and gained experience of and insight to real working practices in a land-based sector. Learners complete the tasks using knowledge and understanding from their studies of the sector and apply both transferable and specialist knowledge and skills.

In assessing the unit assignments will require learners to select from and apply their learning from across their programme. The unit provides further information.

Employer involvement in assessment and delivery

You need to ensure that learners on this qualification have a significant level of employer involvement in programme delivery or assessment. See *Section 4* for more information.

3 Units

Understanding your units

The units in this specification set out our expectations of assessment in a way that helps you to prepare your learners for assessment. The units help you to undertake assessment and quality assurance effectively.

Each unit in the specification is set out in a similar way. There are two types of unit format:

- internal units
- external units.

This section explains how the units work. It is important that all teachers, assessors, internal verifiers and other staff responsible for the programme review this section.

Internal units

Section	Explanation
Unit number	The number is in a sequence in the sector. Numbers may not be sequential for an individual qualification.
Unit title	This is the formal title that we always use and it appears on certificates.
Level	All units are at Level 3 on the national framework.
Unit type	This shows if the unit is internal or external only. See structure information in *Section 2* for full details.
GLH	Units may have a GLH value of 120, 90 or 60. This indicates the numbers of hours of teaching, directed activity and assessment expected. It also shows the weighting of the unit in the final qualification grade.
Unit in brief	A brief formal statement on the content of the unit that is helpful in understanding its role in the qualification. You can use this in summary documents, brochures etc.
Unit introduction	This is designed with learners in mind. It indicates why the unit is important, how learning is structured, and how learning might be applied when progressing to employment or higher education.
Learning aims	These help to define the scope, style and depth of learning of the unit. You can see where learners should be learning standard requirements ('understand') or where they should be actively researching ('investigate'). You can find out more about the verbs we use in learning aims in *Appendix 2*.
Summary of unit	This new section helps teachers to see at a glance the main content areas against the learning aims and the structure of the assessment. The content areas and structure of assessment are required. The forms of evidence given are suitable to fulfil the requirements.
Content	This section sets out the required teaching content of the unit. Content is compulsory except when shown as 'e.g.'. Learners should be asked to complete summative assessment only after the teaching content for the unit or learning aim(s) has been covered.

Section	Explanation
Assessment criteria	Each learning aim has Pass and Merit criteria. Each assignment has at least one Distinction criterion. A full glossary of terms used is given in *Appendix 2*. All assessors need to understand our expectations of the terms used. Distinction criteria represent outstanding performance in the unit. Some criteria require learners to draw together learning from across the learning aims.
Essential information for assignments	This shows the maximum number of assignments that may be used for the unit to allow for effective summative assessment, and how the assessment criteria should be used to assess performance.
Further information for teachers and assessors	The section gives you information to support the implementation of assessment. It is important that this is used carefully alongside the assessment criteria.
Resource requirements	Any specific resources that you need to be able to teach and assess are listed in this section. For information on support resources see *Section 10*.
Essential information for assessment decisions	This information gives guidance for each learning aim or assignment of the expectations for Pass, Merit and Distinction standard. This section contains examples and essential clarification.
Links to other units	This section shows you the main relationship among units. This section can help you to structure your programme and make best use of materials and resources.
Employer involvement	This section gives you information on the units that can be used to give learners involvement with employers. It will help you to identify the kind of involvement that is likely to be successful.

External units

Section	Explanation
Unit number	The number is in a sequence in the sector. Numbers may not be sequential for an individual qualification.
Unit title	This is the formal title that we always use and it appears on certificates.
Level	All units are at Level 3 on the national framework.
Unit type	This shows if the unit is internal or external only. See structure information in *Section 2* for full details.
GLH	Units may have a GLH value of 120, 90 or 60. This indicates the numbers of hours of teaching, directed activity and assessment expected. It also shows the weighting of the unit in the final qualification grade.
Unit in brief	A brief formal statement on the content of the unit.
Unit introduction	This is designed with learners in mind. It indicates why the unit is important, how learning is structured, and how learning might be applied when progressing to employment or higher education.
Summary of assessment	This sets out the type of external assessment used and the way in which it is used to assess achievement.
Assessment outcomes	These show the hierarchy of knowledge, understanding, skills and behaviours that are assessed. Includes information on how this hierarchy relates to command terms in sample assessment materials (SAMs).
Essential content	For external units all the content is obligatory; the depth of content is indicated in the assessment outcomes and sample assessment materials (SAMs). The content will be sampled through the external assessment over time, using the variety of questions or tasks shown.
Grade descriptors	We use grading descriptors when making judgements on grade boundaries. You can use them to understand what we expect to see from learners at particular grades.
Key terms typically used in assessment	These definitions will help you analyse requirements and prepare learners for assessment.
Resources	Any specific resources that you need to be able to teach and assess are listed in this section. For information on support resources see *Section 10*.
Links to other units	This section shows you the main relationship among units. This section can help you to structure your programme and make best use of materials and resources.
Employer involvement	This section gives you information on the units that can be used to give learners involvement with employers. It will help you to identify the kind of involvement that is likely to be successful.

Index of units

This section contains all the units developed for this qualification. Please refer to *page 4* to check which units are available in all qualifications in the Horticulture sector.

Unit 1: Professional Working Responsibilities

Level: **3**

Unit type: **External**

Guided learning hours: **120**

Unit in brief

Learners study professional responsible working practices with a focus on ensuring health and safety, wellbeing, resource management and waste management in the land-based sectors.

Unit introduction

The land-based sectors are made up of diverse industries, with the majority of people being self-employed. The sectors directly manage almost 90% of the UK's land mass. Promoting and maintaining welfare, health and safety, and effective waste management in the working environment is essential for all the sectors. It is also a key requirement for the development of all employees.

In this unit, you will investigate the impact that professional working responsibilities have on personal welfare. You will learn about health and safety legislation, safe working practices, risk assessments, and the professional skills required to work safely and effectively in the land-based sectors. You will develop skills in and knowledge of good practice and professional responsibility towards self and others in the workplace, including the duty of care for the environment, relating this to resource efficiency and responsible management. You will develop your skills to interpret appropriate policies, plans, audits, maps and schematic diagrams in relation to safe working practices, reducing the impact of waste, and analysing documentation to review operational plans. You will develop a sound understanding of personal and professional responsibilities required to enter employment, with a strong awareness of how to be safe and keep others safe. To complete the assessment task within this unit, you will need to draw on your learning from across your programme.

This unit will prepare you for progression to employment in a trainee or supervisory role in the land-based sectors or to set up your own land-based business. You will also gain skills that prepare you for further or higher education courses, including agricultural science, plant science, environmental studies and land management.

Summary of assessment

This unit is assessed by a task set by Pearson.

In the assessed task, learners are given information and will complete a number of activities demonstrating their knowledge and understanding of professional working responsibilities.

The task will be carried out under supervised conditions in a single three-hour session timetabled by Pearson.

The number of marks for the unit is 60.

The assessment availability is January and May/June each year. The first assessment availability is January 2020.

Sample assessment materials will be available to help centres prepare learners for assessment.

Assessment outcomes

AO1 Demonstrate knowledge and understanding of personal and professional working responsibilities and practices, risk management and waste management in the land-based sectors.

AO2 Analyse the application of personal and professional working responsibilities and practices, to risk management, and waste management in the land-based sectors.

AO3 Evaluate approaches to working personal and professional responsibilities and practices, risk management, and waste management in the land-based sectors.

AO4 Make connections between principles and practices of health and safety management in the land-based sectors.

Essential content

The essential content is set out under content areas. Learners must cover all specified content before the assessment.

A Professional responsibilities associated with the workplace

A1 Characteristics of professional working responsibilities and sources of relevant information

- Understanding the scope of professional working responsibilities in the land-based sectors, including:
  - compliance with current legislation and industry codes of practice
  - minimising risk to self, others and the environment
  - following industry best practice
  - working to industry standards
  - developing skills through continuing professional development (CPD).
- Stakeholders associated with developing, promoting and upholding professional responsibilities, including the role of:
  - employers
  - employees
  - government departments and agencies
  - trades unions
  - professional bodies and trade associations.
- Sources of information on professional working responsibilities, including:
  - staff handbooks, staff lists and staff induction documents
  - internet-based resources, including government legislation
  - professional publications
  - codes of conduct
  - contracts of employment.

A2 Characteristics and scope of personal responsibilities in the workplace

- Promoting a working environment and culture that is healthy, safe and effective, including awareness of the role of:
  - industry schemes
  - employer awareness campaigns
  - external training programmes and training providers
  - workplace policies, including whistleblower policies.
- Promoting effective working relationships.
- Awareness of factors that may have a negative impact on own and others' personal welfare and workplace performance, including:
  - personal stress
  - illness
  - work-related stress and workload
  - lone working.
- Accessing sources of assistance and support for wellbeing in the workplace, and their importance, including:
  - NHS services
  - charities
  - professional and trade organisations
  - professional counselling and mental health organisations
  - industry schemes.

- Awareness of the importance of CPD, including:
  - formal and informal opportunities for skills development
  - job shadowing
  - upskilling
  - awareness of industry-specific certificates of competence.

B Health and safety responsibilities

B1 Introduction to health and safety and associated legislation

Awareness of current health and safety legislation that applies in a working environment and how legislation impacts on working activities.

- Statutes and regulations current at the time of assessment:
  - Management of Health and Safety at Work Regulations 1999
  - Health and Safety at Work etc. Act 1974
  - Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) 2013
  - Control of Substances Hazardous to Health (COSHH) Regulations 2002
  - Manual Handling Operations Regulations 1992
  - Work at Height Regulations 2005
  - Provision and Use of Work Equipment Regulations (PUWER) 1998
  - Lifting Operations and Lifting Equipment Regulations (LOLER) 1998
  - The Electricity at Work Regulations 1989.
- Health and safety audit, including:
  - analysis of previous incidents and near misses
  - identifying good practice, poor practice and gaps in health and safety policies and procedures
  - suggesting improvements
  - setting objectives
  - considering cost–benefit implications of issues identified and improvements suggested.

B2 Safe working practices

Awareness of key concepts of safe working practices, with reference to health and safety and the environment.

- The importance of training staff and implementing policies and practices in order to maintain appropriate standards in health and safety practices.
- Access to adequate welfare facilities, including drinking water, toilets, wash facilities.
- Provision of an appropriate and safe working environment, including ventilation, temperature, lighting and adequate maintenance of the working area.
- Provision of first-aid training and equipment, including first aid at work training.
- Using personal protective equipment (PPE) correctly, including when:
  - operating, maintaining and repairing machinery
  - handling organic or hazardous substances
  - requiring protection from ultraviolet (UV) light
  - requiring protection from weather conditions.
- Minimising risk of disease, including:
  - wearing correct clothing
  - using the correct equipment and in the correct manner
  - practising appropriate standards of biosecurity, including hygiene and self-awareness
  - awareness of causes and symptoms of common diseases affecting those working in land-based sectors, including legionnaires' disease, leptospirosis, tetanus, salmonella, Lyme disease, E. coli, cryptosporidium.
- Safe use of machinery, including standard operating procedures (SOPs) for common land-based machinery and the consequences if SOPs are not followed.

- Fire safety, including:
  - fire alarms, extinguishers and blankets
  - ensuring combustible materials are stored in a safe and appropriate way
  - taking reasonable steps to minimise risk of fire and arson in buildings and in the environment.
- Producing and displaying an evacuation plan for all areas, including evacuation in the event of fire.
- Electrical safety, including:
  - requirement for all electrical work to be carried out by a competent person
  - ensuring all electrical equipment is in an appropriate state for use
  - portable appliance testing (PAT) and residual current devices (RCDs)
  - overhead lines and underground cables
  - using rechargeable equipment and tools where appropriate.
- Displaying safety information, including symbols on machinery and product labels.
- Signage, including:
  - fire safety signage
  - signs prohibiting certain behaviour
  - warning signs
  - signs prescribing specific behaviour
  - signs indicating emergency escape or first aid.
- Reporting of accidents and near misses.
- Importance of working in ways that avoid or minimise negative environmental impacts, including:
  - knowledge and application of legislation relevant to environmental impacts
  - being aware of the potential environmental impact, both negative and positive, of activities carried out in the workplace
  - steps that can be taken in order to minimise the negative environmental impacts of work carried out.

B3 Risk assessment

The requirement to carry out risk assessments, dynamic risk assessments and the relationship to current relevant legislation.

- Using and interpreting risk assessments:
  - written or static risk assessments prepared before the activities
  - dynamic risk assessment carried out while undertaking activities
  - qualitative or subjective analysis of risk
  - numerical or objective analysis of risk, including severity and likelihood, hierarchy of controls.
- Risk mitigation strategies and their implementation to manage identified risks, including:
  - cost–benefit analysis of specific mitigation strategies.
- Producing dynamic risk assessments:
  - presence of the general public, employees and contractors
  - interpretation of given information, including product labels, signage and COSHH data sheets
  - lone working practices.

B4 Schematics and maps

The importance of maps and schematic diagrams in establishing the locations of services and drainage, for purposes relating to health and safety, land management and the environment.

- Interpreting and using maps and schematics at a variety of scales.
- Using maps and schematics to analyse and record information, including:
  - the role of Global Positioning System (GPS), aerial photographs and online mapping services.
- Determining and checking the location of services, both overground and underground.

- Equipment and techniques required to locate services accurately, including the:
  - use of cable avoidance tool (CAT) and Genny
  - importance of safe digging techniques
  - importance of isolating services, including gas, water and electric.

B5 Purpose of risk assessment

- Uses and implementation of risk assessments.
- Scenarios for risk assessment use:
  - application of health and safety, environmental and waste management policies and procedures
  - response to a specific incident, including incidents reported in the press
  - the permanent or temporary change of use of land or buildings
  - the purchase or installation of new equipment
  - the development of a new enterprise or new methods of working
  - implementing new initiatives, including changes to legislation.

C Managing waste responsibly and safely

Classify waste, understand the relevant legal responsibilities and develop waste management strategies that consider the cost–benefit implications of waste management.

C1 Animal, plant and non-organic waste

- Definition and sources of organic and inorganic wastes in the land-based sectors, including:
  - aggregates, plastics and metals
  - biodegradable waste
  - controlled waste
  - hazardous waste
  - dirty or foul water
  - grey water.
- Awareness that designated areas in the working environment have specific types of items and processes for waste disposal and management.

C2 Legal responsibilities for waste management

- Current waste management legislation and documentation specific to land-based sectors, including:
  - duty of care
  - waste exemptions
  - waste disposal documentation
  - hazardous and controlled waste
  - custody of waste.
- The waste hierarchy system, including:
  - prevention, including procurement to reduce waste
  - prepare to reuse
  - recycle
  - other recovery, including incineration, anaerobic digestion and gasification, and pyrolysis with energy recovery
  - disposal, including landfill and incineration without energy recovery.
- The potential impact of waste and waste disposal on sustainability, climate change and the environment, including:
  - advantages and disadvantages
  - social factors
  - economic factors
  - environmental factors.
- Innovations in waste management.

C3 Environmental and waste management policies, plans and audits

Documents and processes related to health, safety, the environment and waste management.

- Use of audits to establish the current situation in a business or enterprise.
- Audit procedures, including frequency, checklists, logs, metering and measurements.
- The role of audits to inform or update plans and policies.
- Financial implications and cost–benefit analysis of waste storage and disposal, including:
  - economic advantages and disadvantages of specific waste management strategies
  - environmental advantages and disadvantages of specific waste management strategies.

Grade descriptors

To achieve a grade learners are expected to demonstrate these attributes across the essential content of the unit. The principle of best fit will apply in awarding grades.

Level 3 Pass

Learners will demonstrate knowledge and understanding of basic professional working and safe working in a land-based setting. Learners will demonstrate that they can apply safe working practices to a given context. They will identify areas of good practice, areas where standards could be raised and outline basic methods of doing this. Learners will be able to make some connections between the risks that are associated with a specific activity in a given context, with a range of variables. Learners will apply some valid concepts to the correct and safe management of different types of waste, they will understand the need to apply legal and environmental considerations to this and the management of resources, and its link to sustainability.

Level 3 Distinction

Learners will demonstrate detailed knowledge and understanding of professional working and safe working in a land-based setting. Learners will demonstrate that they can apply justified safe working practices to a given context. They will identify areas of good practice, areas where standards could be raised and outline accurate recommendations for doing this, using a detailed and appropriate action plan. Learners will be able to make appropriate and justified connections between the risks that are associated with a specific activity in a given context, with a range of variables. Learners will apply accurate and detailed concepts to the correct and safe management of different types of waste, they will understand the need to apply legal and environmental considerations to this and the management of resources, and its link to sustainability.

Key words typically used in assessment

The following table shows the key words that will be used consistently by Pearson in our assessments to ensure learners are rewarded for demonstrating the necessary skills.

Please note: the list below will not necessarily be used in every paper/session and is provided for guidance only.

Command or term	Definition
Analyse	Learners present the outcome of methodical and detailed examination either: • to discover the meaning or essential features of a theme, topic or situation • by breaking something down into its components or examining factors methodically and in detail • by identifying separate factors, stating how they are related and explaining how each one contributes to the topic.
Complete	Learners enter relevant information or data as required to a structured item such as a table or diagram.
Dynamic risk assessment	The process of identifying risks and hazards continuously and in response to changes in situations and activities.

Command or term	Definition
Evaluate	Learners review information before bringing it together to form a conclusion or come to a supported judgement of a subject's qualities in relation to its context, drawing on evidence: strengths, weaknesses, alternative actions, significance, relevant data or information.
Health and safety audit	The auditing of information on the effectiveness of health and safety policies and procedures.
Interpretation	Learners are able to draw the meaning, purpose or qualities of something from a stimulus.
Justify/Justification	Learners give reasons or evidence to: • support an opinion and/or decision • prove something right or reasonable.
Recommend	Learners put forward someone or something with approval as being suitable for a particular purpose or role.
Strategies	Method or plan to bring out a desired outcome, such as the achievement of a goal or solution to a problem.
Waste management plan	A plan for the disposal of a range of waste materials, showing consideration of legal requirements, environmental responsibilities and sustainability.

Links to other units

This unit links to *Unit 4: Work Experience in the Land-based Sectors*.

Employer involvement

This unit would benefit from employer involvement in the form of:

- masterclasses
- technical workshops involving staff from local land-based organisations
- contribution of ideas to unit assignment/project materials
- observation during work experience
- support from local land-based organisation staff as mentors.

Unit 2: Plant and Soil Science

Level: **3**

Unit type: **External**

Guided learning hours: **120**

Unit in brief

Learners study the structural and functional features of plants and soils that inform management practices.

Unit introduction

Plants are one of the most amazing and varied living organisms on our planet. They supply us with our oxygen, provide us with food and shape our landscape. Understanding how plants grow and what they need to be successful is essential for their management in a range of sectors and for a broad range of purposes, including growing crops for people or livestock, growing decorative plants and providing environments for leisure or habitat conservation.

In this unit, you will develop an understanding of external and internal plant structures, including plant cells. You will learn about the relationship between these structures and their function, such as how they obtain their nutrition and how they reproduce. You will gain an understanding of important life processes of plants and how these are affected by their environment. You will learn about the physical and chemical characteristics of soil. You will also learn different types of soil, their characteristics and the essential nutrition in soils that plants need to ensure their success.

The knowledge and skills gained in this unit are fundamental to any role where you grow, plant, manage or establish plants. Whether you are working in forestry, arable farming, sports turf, landscaping or gardening, this unit will give you a foundation for further study at higher education or roles in your chosen sector.

Summary of assessment

This unit is assessed by an examination set and marked by Pearson.

The examination will last for 1 hour and 30 minutes. The number of marks for the paper is 80.

The paper will consist of a variety of question types, including extended open response.

The assessment availability is January and May/June each year. The first assessment availability is January 2020.

Sample assessment materials will be available to help centres prepare learners for assessment.

Assessment outcomes

AO1 Demonstrate knowledge of structures and functions in plant and soil science

Command words: complete, describe, give, identify, match, name, state

Marks: ranges from 1 to 4 marks

AO2 Demonstrate understanding of plant and soil science, including soil and plant management practices

Command words: define, describe, explain, give, label, link, match, outline

Marks: ranges from 1 to 4 marks

AO3 Apply knowledge and understanding of plant and soil science in the context of managing plant growth

Command words: analyse, assess, compare, discuss, evaluate, examine, explain

Marks: ranges from 6 to 8 marks

AO4 Make connections between managing soil and plant growth in different contexts

Command words: analyse, assess, compare, discuss, evaluate

Marks: ranges from 6 to 8 marks

Essential content

The essential content is set out under content areas. Learners must cover all specified content before the assessment.

A Plant structure and systems

Structures and functions of plants, including cells, life processes and their role in the growing of healthy plants.

A1 Plant cell structure and specialisations

Structure and function of plant cells and their components linked to their role and location.

- Cell structure and organelles: cell wall, plasma membrane, nucleus, vacuole, cytoplasm, ribosome, mitochondria, chloroplasts, rough endoplasmic reticulum, smooth endoplasmic reticulum, Golgi apparatus, microtubules.
- Cell division by mitosis and meiosis, including prophase, metaphase, anaphase, telophase, cytokinesis, genetic differences.
- Cell specialisations, including distribution of chloroplasts:
  - root, including leucoplasts, endodermis, epidermis, stele, apical meristem, parenchyma, root hair, root cap
  - stem, including parenchyma, lenticels, meristems
  - leaf, including guard cells, epidermis, palisade mesophyll, spongy mesophyll, vascular bundle
  - flowering parts, including chromoplasts, pollen, gametes, zygote.

A2 Plant structure and function

Functions of plant structures in relation to plant growth and development, including changes to seasonal conditions.

- Root and stem structure:
  - root structure, including fibrous, adventitious and taproot system; functions, including anchorage, osmosis and absorption of minerals, transport system to plant, food storage
  - storage organs, including bulbs, corms, rhizomes, tubers
  - shoot structure, stem characteristics, node, internode, lateral bud, terminal bud; leaf arrangements, including alternate, opposite and whorled, lenticel; function, including support, bear leaves, transport system of water and nutrients around the plant, growth
  - vascular bundles, including xylem, phloem, cambium.
- Leaf structure:
  - leaf characteristics, petiole, lamina, margin, midrib, apex, base; veination, including reticulated and parallel
  - differences between evergreen and deciduous leaves
  - leaf types, including simple and compound, petiolated and sessile, leaf shapes.
- Characteristics of evergreen plants, to include *Ilex*, *Taxus* and *Picea.*
- Characteristics of deciduous plants, to include *Betula*, *Fagus* and *Fraxinus*.
- Characteristics of grasses: *Triticum* and *Hordeum*.

A3 Plant processes

Processes and requirements for healthy plant growth, including the features, structure and function of relevant plant tissues.

- Photosynthesis, including:
  - role of chloroplast structure and chlorophylls
  - light dependent and independent stages, carbon fixation
  - factors influencing the rate of photosynthesis, to include temperature, carbon dioxide levels, leaf colour, leaf area, light availability, water supply, nutrients.
- Respiration:
  - aerobic and anaerobic respiration
  - factors influencing respiration rates, including temperature, oxygen, light, carbon dioxide, water availability, plant growth.
- Compensation point in relation to respiration and photosynthesis, including plasmodesmata.
- The role of osmosis in turgidity, flaccidity and plasmolysis.
- Diffusion of carbon dioxide, oxygen and water vapour into and out of plants.
- Translocation in the phloem.
- Transpiration in the xylem:
  - factors affecting transpiration, including the sun, air temperature, humidity, air movement, water supply
  - guard cells and stomata, including regulation of opening and closing to facilitate gas exchange and control transpiration in plants.

A4 Plant nutrition

Nutritional requirements for growth and development of healthy plants.

- Role of the elements required for plant growth:
  - elements from soil water and the atmosphere, carbon (C), hydrogen (H), oxygen (O)
  - macronutrients: nitrogen (N), phosphorus (P), potassium (K), calcium (Ca), magnesium (Mg), sulfur (S)
  - micronutrients: boron (B), chlorine (Cl), copper (Cu), iron (Fe), manganese (Mn), molybdenum (Mo), zinc (Zn), nickel (Ni).

Effects of lack of nutrition on growth and development of plants.

- Effects of the lack of macro and micro nutrients and how these are shown in the plant:
  - signs of deficiencies, chlorosis of the leaves, stunted growth, distorted foliage, aborted flowers or pods, absence of flowering, fruiting, weak stems, leaf striping, leaf spotting, necrosis or plant death
  - causes of nutritional deficiencies, acidic or alkaline soil, deviation from optimum pH, soil type, leaching, drought, waterlogging.

A5 Reproduction systems

- Structure and function of reproductive parts of flowering plants:
  - differences between dioecious, monoecious and hermaphrodite flowering plants
  - angiosperms and characteristics of monocotyledon and dicotyledonous flowers
  - parts of the flower, receptacle, calyx, corolla, perianth, pedicel, peduncle, bract
  - androecium, including filament, anther
  - gynoecium: carpels, ovary, style, stigma.
- Pollination processes:
  - self-pollination and cross-pollination
  - entomophilous pollination and anemophilous pollination and pollen transfer.
- Fertilisation processes – development and characteristics of pericarp in:
  - simple and compound succulent fruit
  - dry fruit, including dehiscent, indehiscent and schizocarpic seeds.

- Germination:
  - parts of the seed, testa, embryo, including cotyledon(s), epicotyl, plumule, hypocotyl, radicle
  - seed dispersal systems, dormancy, viability, vigour
  - hypogeal germination
  - epigeal germination
  - factors that affect successful germination, including age of seed, light, air, moisture, temperature and viability.
- Asexual reproduction, including rhizome and stolon.

B Soil

The characteristics of soil and the importance of soil fertility in relation to plant health and successful growth.

B1 Soil types and texture

- Soil types, to include sand, silt, clay, chalk, peat and loam.
- Soil texture:
  - soil particles for sand, silt, clay and loam, including water holding capacity, permeability, workability, organic matter, particle size, fertility, pH
  - soil grading and particle sizes, including use of hand texturing.

B2 Soil structure

- Soil profiles and horizons in relation to rooting depths, including aggregates, topsoil, subsoil, parent rock.
- Structural characteristics: single grain, granular, blocky, platy, columnar and prismatic structures, including particles, water and air space, and air-filled porosity.
- Effects of topography and weathering on soil:
  - aspect, shape of the land, slopes, dips, free-draining soils, poor drainage, water table
  - climatic factors, including wind, rain, frost, erosion
  - physical, chemical and biological effects on soil formation.

B3 Biological and chemical activities affecting soil health and fertility

Impact on soil health and fertility, and plant growth, of biological and biochemical activities.

- Biological activity in the soil profile: bacteria, fungus, actinomycetes, saprophytic fungi and mycorrhizae.
- Role of rhizobium bacteria in fixing atmospheric nitrogen.
- Indicators of good soil fertility and impact on soil health:
  - interaction of animals and vegetation with soil and links to biological weathering
  - role of organisms in improving soil condition and health
  - living organisms in the soil profile: slugs, snails, earthworms, woodlice, springtails, beetles and eelworms.
- Sources and cycles of carbon and nitrogen.
- The role of organic matter, including humus, peat, farmyard manure, including pig, horse, cow and chicken, slurry, leaf mulch, bark, composts, seaweed, green manure, sewage sludge, straw, industrial waste.

B4 Soil acidity and alkalinity

- Effects on plant and root growth:
  - plant health, nutrient availability, microbial activity, plant yield
  - characteristics of calcifuge, calcicole plants.
- Interpretation of pH scale test results.
- Causes of changes in soil acidity and alkalinity:
  - applications of lime, aluminium sulfate, ferrous sulfate, organic matter
  - poor drainage, watering, buffering capacity.

B5 Soil water

Processes affecting water availability in soil and its effect on plant growth.

- Relationship of soil characteristics to infiltration and permeability rates.
- Cause and effect of water availability, water tables, natural springs, cultivation techniques and drainage.
- Water stress on soils, including drought and flooding.
- Water content and the relationship between:
  - gravitational water and saturation point
  - capillary rise and field capacity
  - hygroscopic action and permanent wilting point
  - moisture holding and water holding capacity.

C Managing plant growth media

C1 Soil management

Managing soil for optimum plant growth in indoor and outdoor soils, including protective environments, gardens, fields and sports turf.

- Soil aeration: purpose and methods.
- Integration of organic matter: purpose and methods.
- Irrigation methods, including water conservation: recycling and rain capture, plant choice, application timings, use of moisture-sensing equipment/computer control.
- Soil drainage methods, including changes to soil texture, water courses and ditches.
- Characteristics of fertilisers:
  - nitrogen (N), phosphorus (P) and potassium (K) ratios
  - length of nutrient release related to fertiliser form
  - application methods for liquid, granular, powder, pellets, granules, powders, prills, frits.
- Adjusting soil acidity and alkalinity: purpose and methods.
- Effects of over application of fertiliser on soil health and plant growth.
- Impact on environment of fertiliser leaching.

C2 Soil alternatives

Purposes and methods of using soil alternatives.

- Purpose of growing plants without the use of soil: yield increase, quicker growth, less use of chemicals, lower incidences of disease, recycling water solutions.
- Drip irrigation (slow feed system), deep water culture (root immersion in nutrient water supply), ebb and flow (periodic flooding of plants).
- Types and characteristics of non-soil material and loam-free composts:
  - large particle material, to include sand and gravel
  - fibrous material, to include sphagnum peat moss
  - porous and absorbent material, to include perlite, vermiculite, rock wool and oasis cubes
  - composted or aged material, to include pulverised bark, coconut coir.

Grade descriptors

To achieve a grade learners are expected to demonstrate these attributes across the essential content of the unit. The principle of best fit will apply in awarding grades.

Level 3 Pass

Learners demonstrate a basic understanding of the structures and functions of plant cells. They are able to identify the main features and requirements of plants as related to their growth. Learners demonstrate an understanding of the characteristics of different soil types and basic methods for managing and improving soil to promote healthy plant growth.

Level 3 Distinction

Learners demonstrate a thorough understanding of plant structure linked to function, from a cellular to whole plant level. They are able to articulate practices used in soil management for optimising plant growth and yield. Learners can analyse data and information relating to plant and soil science and management practices, interpreting this in order to draw reasoned conclusions. They can make connections between the characteristics of different soils, the requirements of plants and the potential implications of soil management practices.

Key words typically used in assessment

The following table shows the key words that will be used consistently by Pearson in our assessments to ensure learners are rewarded for demonstrating the necessary skills.

Please note: the list below will not necessarily be used in every paper/session and is provided for guidance only.

Command or term	Definition
Analyse	Present the outcome of methodical and detailed examination of information or data to interpret and study key trends and interrelationships.
Apply	Put knowledge, understanding or skills into action in a particular context.
Assess	Evaluate or estimate the nature, ability or quality of something.
Compare	Identify the main factors relating to two or more items/situations or aspects of a subject that is extended to explain the similarities, differences, advantages and disadvantages.
Complete	Place a word(s) or number(s) in a sentence, paragraph, table or graph to give the correct answer/sense.
Define	State or describe the nature, scope or meaning of a subject as objective facts.
Describe	Give an account in words of someone or something, including all of the relevant characteristics, qualities or events.
Discuss	Consider different aspects of a topic, how they interrelate and the extent to which they are important.
Draw	Create a graphical or visual representation of information.

Command or term	Definition
Explain	Understand the origins, functions and objectives of a subject and its suitability for purpose. Give reasons to support an opinion, view or argument, with clear details.
Give	Provide one or more piece(s) of information.
Identify	Establish or indicate the origin, nature or definitive character of something. Usually requires some key information to be selected from a given stimulus/source.
Label	Name or provide key information about a stimulus material.
Name	Give the correct term for something.
Outline	Provide a general description of key principles, usually in relation to a process, method or concept.
State	Express the condition of or facts about something definitely or clearly.

Links to other units

This is an underpinning unit for the qualification.

Employer involvement

Centres can involve employers in the delivery of this unit if there are local opportunities to do so. There is no specific guidance related to this unit.

Unit 4: Work Experience in the Land-based Sectors

Level: **3**

Unit type: **Internal**

Guided learning hours: **60**

Unit in brief

Learners research work opportunities in the land-based sectors and the skills needed to attain them, developing communication and employability skills through study and work experience.

Unit introduction

Where do you picture yourself in five years' time? Do you know about the wide range of career opportunities open to you in the land-based sectors? Discovering these opportunities and understanding the skills and qualifications needed in order to gain employment in these sectors will help you to answer these questions as well as to plan your career.

In this unit, as well as investigating employment opportunities, you will examine how good communication and employability skills can improve your prospects in gaining and staying in employment. You will learn how and where to access information about employment vacancies and further courses of study as well as how to develop your curriculum vitae (CV) and adapt it for specific vacancies. You will also learn how to develop good communication, interview and customer service skills. You will apply for and take on available work experience roles in the sector and reflect on your own progress.

This unit will help prepare you for employment in the land-based sectors in areas such as forestry, arboriculture, aquaculture, landscaping, horticulture, fencing, fisheries management, floristry, gamekeeping, conservation, countryside management and wildlife management, and their related service industries. It will also help you progress to higher education in courses such as BSc (Hons) degrees in agriculture, countryside management, horticulture and forestry management.

Learning aims

In this unit you will:

A Investigate employment opportunities in the land-based sectors to target progression

B Develop communication and interview skills to improve employment prospects in the land-based sectors

C Undertake work experience in the land-based sectors to contribute to personal and professional development.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Investigate employment opportunities in the land-based sectors to target progression	**A1** Scope of the land-based sectors **A2** Requirements for progression **A3** Relevant legislation for work placement opportunities	A portfolio of work-related learning research, completed application documents and mock interview outcomes, e.g. observation, video.
B Develop communication and interview skills to improve employment prospects in the land-based sectors	**B1** Applying for work-related activities **B2** Interview skills **B3** Reflecting on preparation and performance	
C Undertake work experience in the land-based sectors to contribute to personal and professional development	**C1** Practical work experience **C2** Work behaviours **C3** Reflecting on workplace practice	A report reflecting on work experience, informed by employer verification of participation and other feedback.

Content

Learning aim A: Investigate employment opportunities in the land-based sectors to target progression

A1 Scope of the land-based sectors

- Analysis of progression opportunities to determine desirability, suitability and feasibility.
- Land-based sectors – appropriate broad representation of current industries, e.g. production crops, agricultural livestock, aquaculture, environmental conservation, countryside management, fencing, fisheries management, floristry, gamekeeping and wildlife management, land-based engineering, landscaping, production and amenity horticulture, forestry and arboriculture.
- Opportunities – the range of career and progression opportunities available within chosen sector and opportunities within related sectors, e.g. retail, leisure, tourism, hospitality.
- Higher education – UCAS, entry requirements, student loans.
- Apprenticeships – requirements, timescales, pay scales, balance between academic and practical work, assessment, higher apprenticeships.
- Employment sectors:
  - public sector, e.g. education, government, local government, countryside officer/ranger, public grounds and parks
  - private sector, e.g. country parks, garden centres
  - voluntary sector or charities, e.g. wildlife trusts, wildlife parks.
- Employment sectors, to include an appropriate broad representation of current industries, e.g. agricultural sales, food production, aquaculture, floristry, production horticulture, land-based engineering.
- Self-employment, e.g. gamekeeper, agricultural contractor, arborist, gardener.

A2 Requirements for progression

Knowledge of formal and informal requirements for progression.

- Entry criteria, including qualifications, skills and knowledge.
- Self-management, including study skills, presentation and attitude, time management and planning.
- Exit criteria for specific progression routes.
- Soft skills, including communication, problem solving, individual and team and leadership skills, personal management.

A3 Relevant legislation for work placement opportunities

- Safeguarding at work placements.
- Contracts of employment and working hours (in relation to age), including zero-hours contracts/fixed-term/hourly-paid/permanent (full-/part-time) contracts, Working Time Regulations 1998, Pay As You Earn (PAYE), statutory leave, maternity/paternity leave, employment status.
- Different legal status of business: single owner (self-employed)/partnership/limited company/self-employed subcontractor.
- Awareness of the impact of current legislation supporting conduct in the workplace for employers and employees (full-time, part-time, casual, interns and work placements), such as:
  - Health and safety at work legislation
  - Equality legislation
  - Data protection legislation
  - Control of substances hazardous to health (COSHH) regulations
  - Reporting of injuries, diseases and dangerous occurrences regulations (RIDDOR)
  - Animal welfare legislation.

Learning aim B: Develop communication and interview skills to improve employment prospects in the land-based sectors

B1 Applying for work-related activities

- Selection of work, including different sources of vacancies such as websites, trade publications and sector-wide bodies, e.g. Lantra.
- Importance of reading job description, personal specification, including relevance of essential or desirable criteria, to include qualifications, skills, experience.
- Completion of CV and adapting CV or job application to specified vacancy.
- Letters of application, supporting statements and completing application forms, to include standing out from the crowd, addressing relevance to employers and how they might shortlist candidates.
- Correct use of language, grammar, spelling and punctuation.

B2 Interview skills

Creating an impression through effective communication.

- Preparation and presentation skills, including:
  - planning and practice for the interview
  - interview styles, e.g. competency or behaviour-based, knowledge-focused
  - personal appearance and hygiene
  - interpersonal skills and attitude
  - body language.
- Listening and talking skills, including:
  - interview conventions
  - use of language – what is/what is not appropriate
  - building rapport
  - developing a dialogue
  - effective listening and questioning
  - non-verbal communication, e.g. eye contact.

B3 Reflecting on preparation and performance

- Reflecting on preparation for interviews and interview performance, including knowledge of employer and role, communication skills, professional behaviour.

Learning aim C: Undertake work experience in the land-based sectors to contribute to personal and professional development

C1 Practical work experience

Operating in workplace practices, including:

- knowledge of the purpose of the business and/or environment
- knowledge of reporting procedures with regard to behaviour and expectations, e.g. lateness, sickness, emergency
- health and safety protocols, e.g. fire safety, emergency procedures
- procedures to maintain confidentiality.

C2 Work behaviours

- Completion of role to add value in the workplace:
  - understanding the extent and limitation of own roles and responsibilities
  - carrying out tasks according to roles and responsibilities
  - following instructions
  - communicating with others
  - self-management
  - working safely
  - reliability, regular attendance and commitment
  - punctuality
  - use of initiative
  - cooperation with colleagues and end users, e.g. customers, clients, other organisations.
- Obtaining feedback, including:
  - timesheets signed by an appointed person at work experience employment, confirming appropriate attendance and punctuality
  - employer or teacher observation/witness statements
  - employer feedback sheets, provided at intervals.

C3 Reflecting on workplace practice

Reflecting on personal performance in relation to own career progression, to include:

- formative feedback from employer(s), colleagues, teacher, stakeholders
- performance self-assessment
- review of areas for development, to include SWOT (strengths, weaknesses, opportunities, threats) analysis, SMART (specific, measurable, achievable, relevant, time-based) target setting, knowledge of SWOT and SMART in learning development.

Assessment criteria

<table>
<tr><th>Pass</th><th>Merit</th><th>Distinction</th></tr>
<tr><td colspan="2">Learning aim A: Investigate employment opportunities in the land-based sectors to target progression</td><td rowspan="4">A.D1 Evaluate how effective preparation for work experience can significantly enhance employment prospects.
B.D2 Evaluate own preparation for and performance in work experience interview, including review of all future opportunities.</td></tr>
<tr><td>A.P1 Explain the value of own research and preparation carried out for work experience, related opportunities and progression routes.
A.P2 Explain accurately the relevant legislation relating to a work placement.</td><td>A.M1 Analyse the value of own research and preparation carried out for work experience, related opportunities and progression routes.</td></tr>
<tr><td colspan="2">Learning aim B: Develop communication and interview skills to improve employment prospects in the land-based sectors</td></tr>
<tr><td>B.P3 Explain the preparation and research carried out for a work experience interview.
B.P4 Demonstrate communication and interpersonal skills as an interviewee for a selected work experience.</td><td>B.M2 Perform proficiently as an interviewee for a selected work experience, using appropriate communication and interpersonal skills.</td></tr>
<tr><td colspan="2">Learning aim C: Undertake work experience in the land-based sectors to contribute to personal and professional development</td><td rowspan="2">C.D3 Evaluate the effectiveness of the work experience carried out in improving occupational and personal skills to make best use of opportunities for employment.</td></tr>
<tr><td>C.P5 Explain how the work experience undertaken has improved occupational and personal skills for future opportunities.
C.P6 Review how own performance during work experience contributed to the employer.</td><td>C.M3 Assess the value of the occupational and personal skills developed during work experience for future opportunities.
C.M4 Analyse the impact on the employer of own performance during work experience.</td></tr>
</table>

Essential information for assignments

The recommended structure of assessment is shown in the unit summary along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of two summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aims: A and B (A.P1, A.P2, B.P3, B.P4, A.M1, B.M2, A.D1, B.D2)

Learning aim: C (C.P5, C.P6, C.M3, C.M4, C.D3)

Further information for teachers and assessors

Resource requirements

For this unit, learners must have access to a work experience role, for example work placement, part-time work, volunteering etc. Employers must be external to the centre.

Teachers should consider devising a set of criteria they can use to give feedback when carrying out practice interviews.

Essential information for assessment decisions

Learning aims A and B

For distinction standard, learners will produce a written report evaluating the quality of their own preparation when seeking work experience. This will include their investigation and research carried out, completion of application documents adapted for specific roles, and completion of a mock interview or employer-evidenced real interview. The report will include conclusions about the quality of each step of the preparation, linking this to the teacher's evaluation of the mock interview and the chance of securing employment. Learners will write a conclusion that includes clear understanding of best practice in this area.

For merit standard, learners will produce a written analysis of the quality of their own preparation when seeking work experience. This will include their investigation and research carried out, completion of application documents adapted for specific roles, and completion of a good mock interview or employer-evidenced real interview. The analysis will include a detailed examination of each step of the preparation, linking this to the chance of securing employment. Learners will include an analysis of the teacher's evaluation of the mock interview.

For pass standard, learners will consider the value of their own preparation when seeking work experience, for example investigation and research carried out, completion of application documents adapted to specific roles, and completion of a mock interview or employer-evidenced real interview. Learners will include links to the teacher's evaluation of the mock interview. Learners could include a SWOT analysis.

Learning aim C

Learners need to review and reflect on their time undertaking work experience. This will relate to the number of hours required by the qualification.

For distinction standard, learners will undertake work experience and supply reasoning in their reflective reports to determine the effectiveness of the completed work experience and its capacity to improve their opportunities for employment. Their reasoning will consider the relationship between the occupational and personal skills developed during the work experience and how these may help them in securing future employment. The relationship between learners' own performance during work experience and its impact on the employer will also be covered. Learners will consider how well they prepared themselves for the work experience activities in order to gain the most from the experience(s). Learners' reflections should take account of employer and teacher feedback, and observations of them during their work experience.

For merit standard, learners will undertake work experience and present in their reflective reports a relationship between the occupational and personal skills developed during the work experience, and a discussion about how these skills will help secure employment. Learners will consider the relationship between their own performance during the work experience and its impact on the employer. Learners' reflections should take account of employer and teacher feedback, and observations of them during their work experience.

For pass standard, learners will undertake work experience and present in their reflective reports a consideration of how they developed different occupational and personal skills during their placement. Learners will make a formal assessment of their own performance during work experience based on feedback, including a SWOT analysis, and link this to their contribution to the employer. Learners' reflections should take account of employer and teacher feedback, and observations of them during their work experience.

Links to other units

This unit links with all others in the specification.

Employer involvement

This unit would benefit from employer involvement in the form of:

- technical workshops involving staff from local land-based organisations
- contribution of ideas to unit assignment/project materials
- observation during work experience
- support from local land-based organisation staff as mentors.

Unit 5: Estate Skills

Level: **3**

Unit type: **Internal**

Guided learning hours: **60**

Unit in brief

Learners develop the skills needed to manage and maintain habitats, structures, surfaces, boundaries and services that are found in the land-based sector.

Unit introduction

Managing the physical environment of the land-based sectors means you need to be able to maintain, repair and install a variety of different structures, surfaces, boundaries and services, as well as maintain habitats, ensuring that work is carried out efficiently and safely.

In this unit, you will develop the knowledge and skills needed to manage the repair, maintenance and installation of the fabric of businesses and organisations working in the land-based sectors. These include forestry, horticulture and agriculture as well as more general countryside management. You will learn to plan, implement and reflect on maintenance tasks, including those you carry out yourself and those completed by others such as staff or professional contractors whose work you will manage. In this unit, you will draw on your learning from across the programme to complete assessment tasks.

This unit will give you the skills required to progress to employment as a trainee farm or forestry worker, garden centre assistant or as part of an estate management team. It is also an excellent introduction to a degree in estate management.

Learning aims

In this unit you will:

A Explore estate skills for the management and maintenance of habitats and environments

B Undertake estate skills and their management for the land-based sector

C Carry out the supervision of others engaged in maintenance, repair and installation tasks in the land-based sector.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Explore estate skills for the management and maintenance of habitats and environments	**A1** The nature and scope of estate skills for land-based sector management **A2** Assessing needs **A3** Planning tasks	A portfolio of evidence that plans for estate management projects. The portfolio should include: • surveys • relevant legislation and codes of practice • a plan, including schedules and specifications.
B Undertake estate skills and their management for the land-based sector	**B1** Working safely **B2** Practical estates tasks **B3** Reflecting on tasks undertaken	Evidence of tasks carried out and reflection on task outcomes, to include: • logbooks, observation records and witness statements of tasks undertaken • a review of task outcomes.
C Carry out the supervision of others engaged in maintenance, repair and installation tasks in the land-based sector	**C1** Workforce supervision **C2** Supervise estate skills undertaken **C3** Evaluate estate skills tasks completed	Evidence of the supervision of others in carrying out tasks, to include: • an evaluation framework that includes task outcome and workforce supervision • observation records and witness statements that demonstrate supervision and management of scheduled tasks • a review of the outcomes of tasks carried out by others • a review of own supervision of a workforce.

Content

Learning aim A: Explore estate skills for the management and maintenance of habitats and environments

A1 The nature and scope of estate skills for land-based sector management

Understanding the form and function of estate skills elements that are found in the land-based sector.

- Boundaries, including:
  - deer or rabbit fencing, electric fencing, stock fencing, and post and rail fencing
  - decorative fencing.
- Surfaces, including:
  - paths, tracks, rides, accommodation flooring, grassed surfaces
  - drainage of surfaces, including field drains.
- Structures to provide for land-based management, including:
  - field structures, e.g. field shelters, stiles and way markers, greenhouses, cold frames, raised beds
  - gates and water troughs
  - internal structures, e.g. drinkers, stall furniture and feeders
  - finishes, including paints, varnishes and preservatives.
- Habitat maintenance for land-based management, including:
  - weed and invasive plant control, scrub clearance, hedgerow cutting/layering
  - wildlife refuges, e.g. nesting/resting boxes, woodpiles, hedgehog tunnels.
- Supply, distribution or storage of mains services and utilities, including:
  - water and gas, including bottled gas, electricity, fuel, oil
  - sewerage, including mains, cesspit and septic tank.
- Materials, tools and construction methods used for estate skills tasks:
  - basic construction materials, e.g. wood, concrete, woodchip, tarmac, type 1 aggregate, fencing, galvanised sheets, polypropylene piping
  - common specialist tools and basic test equipment, e.g. circuit tester
  - fixtures and fittings, e.g. hinges, locks, ball valves, pipe connections
  - selection, transport, maintenance and storage of tools, materials and equipment.

A2 Assessing needs

Inspection of boundaries, surfaces, structures, services and habitats.

- Inspecting boundaries, surfaces, habitats and structures for their maintenance, repair, construction and installation needs.
- Inspection and basic fault-finding of electrical circuits and devices using non-contact test equipment.
- Inspection of drainage, gas and water services for leaks and blockages.
- Methods and processes for reporting inspection findings, to include verbal and written, use of appropriate maps, plans and diagrams.

A3 Planning tasks

The application of regulations and specific, current regulations and guidance notes relevant to estate skills for land-based management, including health and safety at work and those relating to animal welfare.

- Government welfare codes of practice for specific animals and plants.
- Use of risk assessments, their purpose and types, including static, dynamic, qualitative and quantitative.
- Correct selection and use of personal protective equipment (PPE).
- Assessing the task, including measuring, estimating, use of maps, diagrams and plans.
- Creating and using schedules of tasks.

- Job specifications, to include job description and rationale, timescales, tools, equipment, materials, location of work, costs, skill sets, health and safety considerations, environmental issues and supervising arrangements.
- Sourcing tools, equipment, materials, skill sets, e.g. internal workforce, external contractors.
- Processes and aids to planning tasks, including budgets, schedules and flow charts.
- The use of IT in raising and monitoring repair and maintenance tasks.
- Communications with contractors and employees to ensure efficient planning.

Learning aim B: Undertake estate skills and their management for the land-based sector

B1 Working safely

- Compliance with appropriate health and safety regulations and guidance, e.g. PPE, animal welfare.
- Selection of the correct tools, equipment and materials.
- Transportation of tools, equipment and materials.
- Preparation of the work area.
- Correct and safe use of tools and equipment.
- Waste disposal in accordance with regulations.
- Maintaining and storing tools, equipment and materials.

B2 Practical estates tasks

Maintenance, repair construction and installation of:

- boundaries, to include post and rail fencing, hedgerows, electric fencing and strained fencing, e.g. stock or chain link fencing
- surfaces, to include aggregate or concrete, woodchip, wood, sand or artificial products, e.g. woodchip or grassed paths, forest access roads, ornamental paving
- structures, e.g. greenhouses, field shelters, gates, stalls, troughs, feeders, stiles, signage
- drainage, e.g. unblocking drains or field drains, clearing an open ditch
- isolation of mains services in the event of leaks or for maintenance, repair, construction and installation tasks
- basic repair of electrical appliances or circuits, e.g. changing a plug or fuse, resetting a circuit
- use of basic equipment to locate underground or hidden services
- installation of temporary electric supply for both indoor and outdoor power requirements, e.g. extension leads, electric fence batteries, small generators
- repair, maintenance or installation of systems to supply water, e.g. to a water trough, irrigation system or to allow a tap and hose to be connected to an existing system
- habitats, e.g. brush clearance, hedgerow cutting, construction of wildlife refuges.

B3 Reflecting on tasks undertaken

Process for reviewing the tasks undertaken to assess the impact on land-based management, to include:

- matching skills to tasks
- taking account of problems that arise and using problem-solving techniques
- comparing the time taken with the time allocated and the time needed
- identifying inefficient working practices
- monitoring actual costs against estimates and identifying cost overruns
- examining specifications to improve clarity and eliminate ambiguity
- monitoring compliance with regulations, guidance and advice notes
- assessing communication to identify improvements.

Learning aim C: Carry out the supervision of others engaged in maintenance, repair and installation tasks in the land-based sector

C1 Workforce supervision

- Identifying skill sets, e.g. internal workforce, external contractors.
- Communicating maintenance, repair, construction and installation needs to in-house teams and outside contractors, to include raising orders, issuing instructions orally and in writing, getting estimates and quotations, commissioning contractors and understanding contracts.
- Using written communication skills:
  - using correct spelling, punctuation and grammar
  - adopting different styles, including formal and informal.
- Using oral communication skills:
  - using tone, inflexion and style when speaking
  - using aids, e.g. maps and plans.

C2 Supervise estate skills undertaken

- Ensuring the work is proceeding according to expectations, e.g. site visits, problem solving and evaluating the progress of estate skills tasks, ensuring compliance with specifications, checking the progress of work against the specification, regulations and codes of practice and risk assessments.
- Using problem-solving skills to assess issues, examine alternative solutions, decide on a course of action, implement solutions and monitor outcomes.

C3 Evaluate estate skills tasks completed

Using evaluation frameworks to enable assessment of completed tasks and workforce management.

- Creating evaluation frameworks using details of the original specification as a checklist.
- Evaluating completed products, including compliance with specifications, regulations, and codes of practice and risk assessments.
- Communicating evaluation outcomes, ensuring correct task completion, including situations where there is a dispute.
- Creating evaluation frameworks for assessing workforce management, to include:
  - selection of workforce
  - communication of task
  - supervision of work in progress
  - application of problem-solving skills
  - feeding back on outcomes of task.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Explore estate skills for the management and maintenance of habitats and environments		
A.P1 Explain findings of own surveys undertaken to establish estate skills needs. **A.P2** Select information from the findings of own surveys undertaken to plan for the management of an estate skills task.	**A.M1** Analyse the results of own surveys undertaken to produce a schedule for the management of estate skills tasks.	**A.D1** Evaluate the likely impact of the schedule produced for the management of estate skills tasks resulting from own surveys undertaken.
Learning aim B: Undertake estate skills and their management for the land-based sector		
B.P3 Perform simple estate skills tasks to an agreed specification. **B.P4** Explain how own estate skills tasks undertaken meet job specifications.	**B.M2** Perform complex estate skills tasks to an agreed specification and within an agreed timescale. **B.M3** Assess own performance in carrying out estate skills tasks to meet job specifications.	**B.D2** Evaluate the standard of own estate skills tasks undertaken in relation to job specifications.
Learning aim C: Carry out the supervision of others engaged in maintenance, repair and installation tasks in the land-based sector		
C.P5 Demonstrate the management and supervision of a simple estate skills task. **C.P6** Explain the effectiveness of own workforce supervision of an estate skills task.	**C.M4** Demonstrate the management and supervision of a complex estate skills task. **C.M5** Analyse the effectiveness of own workforce supervision of an estate skills task, identifying areas for improvement.	**C.D3** Evaluate the effectiveness of own workforce supervision of a complex estate skills task, detailing improvements.

Essential information for assignments

The recommended structure of assessment is shown in the unit summary along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of three summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aim: A (A.P1, A.P2, A.M1, A.D1)

Learning aim: B (B.P3, B.P4, B.M2, B.M3, B.D2)

Learning aim: C (C.P5, C.P6, C.M4, C.M5, C.D3)

Further information for teachers and assessors

Resource requirements

For this unit, learners must have access to:

- a range of common and specialist hand tools, including power tools and testing equipment
- suitable PPE
- a wide range of suitable estate skills tasks, including the provision of mains and temporary services.

Essential information for assessment decisions

Learning aim A

For distinction standard, learners will conduct surveys of land-based establishments. They will use a range of appropriate test equipment independently and proficiently. They will readily understand complex estate skills issues, considering causes and making connections with usage and consequences if unaddressed, exploring the situation thoroughly. Learners will present meticulous findings in the form of annotated maps, plans, diagrams and accompanying notes. They will be assured in their assessment of issues and their decisions in respect of repair, maintenance or installation needs.

Learners will produce comprehensive and flexible plans, reprioritising tasks where appropriate in order to use time and resources efficiently. Plans will include a detailed appraisal of work required and a thoroughly considered, time-specific schedule of work. Learners will give a clear rationale for all their recommendations, demonstrating detailed awareness of the influence of relevant governing legislation and codes of practice, and the impact on the establishment if the work is delayed or not completed. Job specifications produced will be comprehensive. Learners will show that they have considered how their plans will be effective in terms of, for example, use of resources, completion of tasks, meeting identified needs.

For merit standard, learners will conduct surveys of land-based establishments. They will use a range of appropriate test equipment safely and without supervision. They will interrogate the causes of issues, suggesting remedial action and, where appropriate, prevention in relation to repair, maintenance or installation needs. They will explore the complexity of faults and issues, considering less obvious factors. Learners will present detailed findings in the form of annotated maps, plans, diagrams and accompanying notes.

Learners will plan proactively with clear timescales for repair, maintenance and installation needs. Their plans will clearly demonstrate an understanding of the need to prioritise work, and an appreciation of realistic timescales and resources. Their planning will demonstrate a detailed assessment of the work required and a time-specific schedule of work. Consideration will be given to relevant governing legislation and codes of practice. Job specifications produced will be clear and detailed.

For pass standard, learners will conduct surveys of land-based establishments. They will use a range of appropriate test equipment, under supervision where necessary. Learners will understand major issues and correctly identify methods of repair, maintenance or installation. They will record correct findings appropriate to each situation surveyed, presenting the information in the form of annotated maps, plans, diagrams and accompanying notes. The notes and annotations will give clear reasoning for their findings.

Learners' plans will address key repair, maintenance and installation needs, correctly prioritising works using broad timescales. Where appropriate, their plans will take into account governing legislation and codes of practice. Job specifications produced will contain key information.

Learning aim B

For distinction standard, learners will carry out complex tasks that require multiple operations, using appropriate equipment and a variety of tools and materials. Tasks will be undertaken efficiently, accurately and completely, meeting the specification. Learners will work to a professional industry standard and they will comply with best workplace practice.

Learners will review the qualitative standard of practical work undertaken to improve the completion of tasks, supporting their views with reasoned judgements.

For merit standard, learners will carry out complex tasks that require multiple operations, using appropriate equipment and a variety of tools and materials. Tasks will be undertaken efficiently, accurately and completely, meeting the specification. Learners will work to the standard of a competent employee. They will carry out complex tasks that require the installation, maintenance or repair of boundaries, surfaces, habitats and either mains or temporary services.

Learners will demonstrate best workplace practice by working safely and in accordance with relevant legislation, ensuring the workplace is prepared and cleared. They will understand the need for, and demonstrate, correct tool, material and equipment procedures, including selection, use, transport, maintenance and storage.

Learners will review their work in light of the job specification and the standard achieved, giving valid suggestions for improvements in tasks.

For pass standard, learners will carry out simple estate skills tasks, requiring few operations and a limited range of tools and materials. Tasks will be undertaken efficiently, accurately and completely, meeting the specification. They will work to the standard of a novice employee. Learners will carry out simple tasks that require the installation, maintenance or repair of boundaries, surfaces, habitats and either mains or temporary services.

Learners will demonstrate acceptable workplace practice by working safely and in accordance with relevant legislation, ensuring the workplace is cleared after task completion. They will demonstrate correct tool, material and equipment procedures, including selection, use, transport, maintenance and storage.

Learners will review their work in light of the job specification.

Learning aim C

For distinction standard, learners will carry out effective and comprehensive workforce supervision that demonstrates clear, concise, unambiguous, oral and written communications suited to the recipient, such as contractors or colleagues.

Learners will delegate responsibilities appropriately according to skill sets and resources. They will monitor and assess task progression, advising only when necessary, using positive and flexible problem-solving skills when needed. They will assess the completed task against the specification and communicate their findings concisely and assertively.

Learners will draw up a valid and reliable evaluation framework to use when assessing their management of completed tasks. They will identify specific areas where their management of the task could have improved efficiency, safety or cost-effectiveness, and will make valid recommendations that would achieve this.

For merit standard, learners will demonstrate they can communicate clearly and appropriately with a workforce, such as contractors or colleagues, both orally and in writing.

Learners will delegate responsibilities. They will accurately assess the progress of a complex task and demonstrate problem-solving skills when needed. They will communicate appropriately their assessment of the progress of a task.

Learners will draw up an accurate evaluation framework to use when assessing workforce management. They will make recommendations for improvements in their own performance.

For pass standard, learners will demonstrate that they can issue simple workforce instructions, both orally and in writing.

Learners will carry out supervision of tasks, including checks on progress and identifying obvious issues that may hinder task completion to the specification. Where problems occur, learners will make suggestions and may intervene directly. Learners will provide basic feedback to the workforce on the progress of the task.

Learners will draw up a simple evaluation framework to use when assessing their management of the workforce, identifying their own strengths and weaknesses.

Links to other units

This unit links to *Unit 4: Work Experience in the Land-based Sectors*.

Employer involvement

This unit would benefit from employer involvement in the form of:

- masterclasses
- technical workshops involving staff from local land-based organisations
- contribution of ideas to unit assignment/project materials
- observation during work experience
- support from local land-based organisation staff as mentors.

Unit 6: Identification, Planting and Care of Plants

Level: **3**

Unit type: **Internal**

Guided learning hours: **60**

Unit in brief

Learners develop the skills needed to identify plants using botanical nomenclature, and their requirements for planting and initial aftercare.

Unit introduction

Plants shape our environments, bringing colour, beauty and wildlife, and thrive in both urban and rural locations. Planting occurs for many reasons, including the management of native woodland, the shaping of the landscape, the production of edible fruit, or simply as ornamental, stand-alone specimens. Being able to correctly identify plants is an essential part of becoming a horticulturalist, especially when selecting the appropriate plants for planting.

In this unit, you will learn the correct botanical nomenclature and terminology used when identifying plants, as well as the individual characteristics that aid their identification. You will research a range of different plants suitable for a given area and select appropriate plants for planting, using your knowledge of their individual requirements. You will complete practical tasks in planting your chosen plants and providing initial aftercare so that they establish successfully. Understanding plant requirements and providing suitable surroundings and aftercare will mean that your plants will flourish.

This unit will give you the skills to identify, plant and care for plants. These skills are a huge advantage for progression to employment in roles such as a greenkeeper, gardener in the grounds of a stately home, or an expert who recommends and sells plants in a garden centre. Alternatively, you may wish to progress to higher education, for example to a horticulture degree.

Learning aims

In this unit you will:

A Understand botanical nomenclature and terminology for the purpose of plant identification

B Explore factors affecting the selection of plants and their suitability for planting

C Undertake planting and initial aftercare of plants.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Understand botanical nomenclature and terminology for the purpose of plant identification	**A1** Terminology used in plant nomenclature **A2** Categorisation of plants **A3** Characteristics of plants for identification	A written report on the use of biological nomenclature and plant characteristics and how they are used for plant identification
B Explore factors affecting the selection of plants and their suitability for planting	**B1** Selecting plants **B2** Factors affecting the suitability of plants	Research notes on the factors that affect the selection and suitability of plants for planting, using findings to select plants to plant in a given area. A portfolio of evidence showing how plants are selected, planting activities and initial aftercare to ensure plants establish successfully.
C Undertake planting and initial aftercare of plants	**C1** Preparation for planting **C2** Planting methods **C3** Providing initial aftercare	

Content

Learning aim A: Understand botanical nomenclature and terminology for the purpose of plant identification

Naming conventions and taxonomic categories used to identify plants based on their features, and the importance of using the correct terminology.

A1 Terminology used in plant nomenclature

- Plant classification order:
  - kingdom
  - phyla, including pteridophytes, bryophytes, gymnosperms and angiosperms
  - class, including monocotyledons and dicotyledons
  - family
  - genus
  - species
  - sub-species, variety, cultivar, hybrid.
- Importance of botanical names:
  - problems that occur using common plant names, including using the native tongue, regional differences, common names being similar but not belonging to the same genus
  - reclassification and why this happens, including international codes and characteristics of a plant
  - binominal system for plant naming.
- Correct format for writing plant names:
  - correct use of capital letters, lower-case letters, single quotation marks
  - correct use of symbols and abbreviations
  - correct use of descriptive names to aid identification, e.g. variegata, pendula, grandiflora.

A2 Categorisation of plants

Definition, categorisation and identification of plants from native and non-native species:

- annuals, biennials and ephemerals
- hardy perennials
- herbaceous perennials
- woodies; trees and shrubs
- alpines
- grasses
- climbing plants
- weeds
- aquatic plants
- tropical/temperate plants
- exterior, interior, ornamental.

A3 Characteristics of plants for identification

Methods used to identify plants, using plant features and characteristics.

- Morphological features used in the identification of plants:
  - flowers, including bud, calyx, corolla, androecium, gynoecium, shape, colour arrangement
  - foliage, including stem, lenticels, nodes, internodes
  - venation, including primary veins, secondary veins, reticulated and parallel, simple and compound
  - leaf types, including cordate, ovate, lanceolate, linear, oblong, palmate, pinnate, trifoliate, lobed

  - leaf colour
  - leaf arrangement, including alternate, spiral opposite and whorled, leaf bud, petiolate and sessile
  - margins and modifications
  - succulent fruits, including berries, fruits and drupes
  - seeds
  - seasonal features, including stems, foliage, flowers, seeds, fruits.
- Identification methods and tools:
  - tactile features, including smooth, soft, spiked, rough, spongy
  - smell, including fragrant flowers, foliage, sap
  - visual observations, including growth habit, height, spread
  - form, including oval, columnar, rounded, pyramidal, weeping, irregular, vase
  - illustrated textbooks, nursery catalogues, brochures and labels
  - technology, including internet research, smartphone apps
  - identification keys, including flow chart, dichotomous key.
- Sources of information and standards for classification, e.g. Kew Gardens, The Woodland Trust.

Learning aim B: Explore factors affecting the selection of plants and their suitability for planting

B1 Selecting plants

Plant requirements:

- preferred soil type, including clay, sand, slit, loam, pH
- nutrient requirements, including primary/macronutrients, secondary nutrients and trace elements for growth, vigour, establishment, flowering and fruiting
- aspect, including light and shade tolerance, space, frost and sun pockets, protection, topography, air quality
- support needs, including stakes, frames, wall, fence, trellis
- planting stock type, including bare root, root balled, containerised, seedlings, plugs and transplants
- specific requirements, including protection and support type for individual plants, including delphinium, dahlia, begonia, cordyline, lonicera, wisteria, cortaderia, agave and musa.

B2 Factors affecting the suitability of plants

- Plant growth and habit:
  - size of plant at planting, growth speed, root spread, size and shape and appropriateness for given purpose, including prostrate, fastigiate, columnar, weeping, broad, round, irregular.
- Surroundings that affect plant selection:
  - environmental factors, including buildings and structures, established plants, hard and soft landscaping, overhead and underground services, climate and microclimate, traffic, exposure, drainage, uneven ground, preferred habitat, space
  - access areas, including public, vehicles, maintenance, footpaths, rights of way, falling leaves, fruit, overhanging branches, roots
  - aesthetic value, grouping and combinations, including shape, size, colour, texture, scent
  - intended purpose of area, including formal and informal, temporary and permanent, interior and exterior; themed, e.g. sensory, ecological to add wildlife value, recreational, leisure
  - soil structure; texture; pH; drainage; depth; nutrient value, including impact on anchorage and support systems.

Learning aim C: Undertake planting and initial aftercare of plants

Considerations when preparing to plant, planting and providing initial aftercare for plants.

C1 Preparation for planting

- Assessing risk and working safely:
  - identification of hazards and risks of the work area (related to tools, equipment and people) and how these can be minimised, including essential personal protective equipment (PPE)
  - legislation, including Environmental Protection Act 1990, Wildlife and Countryside Act 1981, Health and Safety at Work etc. Act 1974, Control of Substances Hazardous to Health (COSHH) Regulations 2002
  - methods for working safely and minimising damage to working areas.
- Use and application of correct tools, materials and equipment to prepare ground for planting:
  - tools, including spade, rake, hoe, trowel, hand fork, wheelbarrow
  - materials, including stakes, ties, guards, soil conditioners, organic matter, fertiliser base dressing
  - machinery, including cultivator, rotavator.
- Ground preparation:
  - cultivation by hand or machine, including correct depth, consolidation, level, addition of soil conditioners, ameliorants, fertilisers, anti-desiccants, mycorrhizal use, as appropriate to area
  - removal of plant debris, weeds, organic and inorganic waste before planting and correct disposal.

C2 Planting methods

Activities carried out to ensure optimum condition for planting and successful establishment.

- Use and application of correct tools and equipment for planting:
  - tools, including spade, rake, hoe, trowel, hand fork, secateurs, wheelbarrow.
- Plant preparation, including watering, pruning, removal of weeds, deadheads and dead leaves to ensure plants look good and are in optimum condition for planting for successful establishment.
- Planting:
  - safe working practices to minimise damage to working area and self
  - ensuring planting hole is sufficient and correct depth achieved
  - handling plants without causing damage
  - backfilling
  - safe disposal of waste, including organic and inorganic
  - safe removal of tools and equipment.

C3 Providing initial aftercare

Methods, equipment and materials used for successful establishment and growth.

- Plant protection, including support, e.g. stakes, ties, frames for protection from animals, people and weather.
- Initial aftercare to ensure successful establishment of plants, including feeding, watering, pruning, mulching with organic and inorganic materials; disposal of waste, including organic and inorganic, importance of recycling materials where possible.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Understand botanical nomenclature and terminology for the purpose of plant identification		
A.P1 Explain how botanical nomenclature and terminology are used to identify plants, using outline examples. **A.P2** Explain plant classification and different characteristics that aid identification, using outline examples.	**A.M1** Analyse how botanical nomenclature and characteristics are used to aid plant identification, using relevant examples.	**A.D1** Justify how botanical nomenclature and characteristics are used to aid plant identification, using detailed and accurate examples.
Learning aim B: Explore factors affecting the selection of plants and their suitability for planting		
B.P3 Explain the considerations that have influenced own selection of plants for use in a given area. **B.P4** Explain why the selected plants are suitable for a given area.	**B.M2** Analyse the factors that have influenced own selection of plants, giving detailed examples of why they are suitable for a given area.	**B.D2** Evaluate own selection of plants based on factors that affect selection and suitability for a given area.
Learning aim C: Undertake planting and initial aftercare of plants		
C.P5 Demonstrate safe working practices when carrying out ground preparation, planting and aftercare to establish new plants. **C.P6** Explain methods used to carry out planting and initial aftercare of plants.	**C.M3** Demonstrate efficiency when preparing, planting and providing appropriate aftercare to establish new plants. **C.M4** Analyse the impact of own methods used to carry out planting and aftercare.	**C.D3** Demonstrate the effective preparation, planting and aftercare in the establishment of new plants, with a detailed analysis of the impact of the methods used.

Essential information for assignments

The recommended structure of assessment is shown in the unit summary along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of two summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aim: A (A.P1, A.P2, A.M1, A.D1)

Learning aims: B and C (B.P3, B.P4, C.P5, C.P6, B.M2, C.M3, C.M4, B.D2, C.D3)

Further information for teachers and assessors

Resource requirements

For this unit, learners must have access to:

- a range of plants to study, from young to mature (this can be off site)
- an area to plant and establish new plants
- appropriate, well-maintained tools, equipment and materials for preparing ground, planting and providing initial aftercare to plants
- suitable PPE.

Essential information for assessment decisions

Learning aim A

For distinction standard, learners will provide a thorough and detailed account of the effectiveness of biological nomenclature and physical plant characteristics when identifying plants. They will show depth of understanding by making detailed links between their use and plant identification, using well-selected, accurate examples of how this leads to positive identification. Learners will provide detailed reasoning as to the limitations of using descriptive biological nomenclature and characteristics to identify plants, using well-selected examples of negative identification.

Learners will consider identification methods and tools thoroughly, recommending those that lead to positive identification.

For merit standard, learners will examine the effectiveness of biological nomenclature and characteristics when identifying plants. They will demonstrate their understanding by making clear links between their use and plant identification, using appropriate examples of how this leads to positive identification. Learners will demonstrate awareness of the limitations of these methods to identify plants, and support this through the use of examples and an explanation of some of the issues.

Learners will demonstrate a clear understanding of identification methods and tools, and provide clear reasoning as to the link between the methods and positive identification.

For pass standard, learners will demonstrate a clear understanding of the approach used in botanical nomenclature and the methods used to obtain a positive identification of plants using physical characteristics. Learners will demonstrate some awareness that there are limitations to their use.

Learners will provide details of a number of identification methods and tools, and the main reasons they may be selected for use.

Learning aims B and C

For the assessment, learners should be provided with a given area to carry out the selection, preparation, planting and aftercare of plants.

For distinction standard, learners will demonstrate clear and detailed reasoning for their plant selection through a thorough examination of the given planting area, considering all relevant aspects that may affect successful establishment. This will include full details of the plant requirements for successful growth, meticulously linked to the site conditions. Learners will consider their choices carefully, and fully justify their selection in relation to factors affecting suitability.

Learners will carry out planting and initial aftercare that is effective in supporting the successful establishment of their chosen plants. Learners will evidence clear ways to minimise risks and fully demonstrate competent safe working practices throughout. They will select correct tools, materials and equipment, using them safely and to industry standard. They will draw on knowledge from their learning to reflect on the decisions they made when planting and carrying out practical tasks. Efficient care of the plants will be provided throughout the planting and aftercare processes.

Learners will show a comprehensive understanding of plant requirements before planting, during planting and when providing initial aftercare to support the successful establishment of plants.

Learners will review the methods they used for planting and initial aftercare to thoroughly explore where they were successful and where methods could be improved or carried out differently.

For merit standard, learners will provide evidence to show that they have researched different plants and plant types to select plants for planting that clearly match the site conditions and the likelihood of successful establishment. Learners will review their selection of plants, presenting well-documented evidence and making reasoned recommendations for their selection, providing clear links between the features of the given planting site and the selected plants.

Learners will carry out planting, showing they have optimised the given area through the preparation of the site and plants, planting with skill, and by demonstrating efficiency in the time taken, the resources used and the minimal disruption to the plants during the planting process. Learners will draw on their knowledge to consider ground conditions and prepare the area appropriately. They will assess the hazards and risks involved in carrying out the practical tasks and use the required tools, materials and equipment safely and competently.

Learners will show detailed knowledge of individual plant requirements in order to provide initial aftercare that helps to support successful establishment, for example providing plant supports for weak-stemmed plants.

Learners will reflect on the methods they used and make clear connections to their impact on the successful establishment of plants.

For pass standard, learners will provide details of the features and characteristics of a given area and research a range of suitable plants for the area, demonstrating an understanding of different plant types, requirements and any limiting factors of the area to be planted. Learners will select a range of plants from those researched, making links between site characteristics and plant requirements.

Learners will work safely, with an awareness of the risks and potential issues arising when preparing the ground for planting, during the planting process, and when providing initial aftercare. Learners will use appropriate methods, tools and equipment to prepare and plant their selected plants, leaving the area clean and tidy on completion. Learners will provide basic aftercare for plants, showing consideration for time of year and the group of plants, for example applying mulch over the area planted in early spring or late autumn. On completion of the tasks, learners will safely remove and store tools, materials and equipment, disposing of waste materials appropriately.

Learners will provide reasons for their selected methods of planting and aftercare, demonstrating some understanding of the impact these methods have on the successful establishment of plants.

Links to other units

This unit links to:

- Unit 4: Work Experience in the Land-based Sectors
- Unit 5: Estate Skills
- Unit 8: Plant Propagation Activities.

Employer involvement

This unit would benefit from employer involvement in the form of:

- masterclasses
- technical workshops involving staff from local land-based organisations
- contribution of ideas to unit assignment/project materials
- observation during work experience
- support from local land-based organisation staff as mentors.

Unit 7: Routine Plant Management

Level: **3**

Unit type: **Internal**

Guided learning hours: **60**

Unit in brief

Learners explore and apply skills to cultivate, grow and maintain a selection of plants.

Unit introduction

The routine management of plants is essential to support their healthy growth and development and crucial to maintaining plant husbandry from cultivation through to successful establishment.

In this unit, you will draw on your knowledge and skills developed across the programme to cultivate, grow and maintain a selection of plants, applying your skills and understanding of their planting and growing requirements. You will learn and apply plant husbandry skills to establish and maintain growth, keeping accurate records of their progress. To complete the assessment task within this unit, you will need to draw on your learning from across your programme.

This unit will be helpful if you want to progress to employment in the land-based industries that are involved with plant husbandry in roles such as gardener, landscape and garden designers, or working in a garden centre. It is also suitable if you want to seek self-employment in the industry. This unit will also enable you to progress to higher education courses such as degrees in plant or crop science.

Learning aims

In this unit you will:

A Understand planting and growing requirements to support the healthy growth of plants

B Apply cultivation methods for plant husbandry and growth

C Carry out routine husbandry tasks to maintain the health and growth of plants.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Understand planting and growing requirements to support the healthy growth of plants	**A1** Establishing plants **A2** Requirements for growth	A presentation/report on the establishment techniques and growth requirements for plants.
B Apply cultivation methods for plant husbandry and growth	**B1** Cultivation methods **B2** Planting systems	An evaluative report on the effectiveness of husbandry techniques used in the care of plants supported by evidence of practical plant husbandry activities, including diary entries, photographs, and witness statements.
C Carry out routine husbandry tasks to maintain the health and growth of plants	**C1** Working safely **C2** Feeding and watering requirements **C3** Temperature, ventilation and plant protection	

Content

Learning aim A: Understand planting and growing requirements to support the healthy growth of plants

A1 Establishing plants

Factors to consider when selecting and establishing plants, including:

- types of plants used in common planting systems, to include annual, biennial and perennial, grasses for greenkeepers, and ornamental grasses
- variety and choice, genus and species, cultivars, resistance to weather, disease and drought, yield, end use, suppliers' recommended varieties
- requirements of the plant, e.g. space, light and orientation to maintain healthy growth and development
- growing conditions and mediums, to include tilth, texture, soil, compost, hydroponics, alternative mediums
- climatic requirements, including variations in rainfall, temperature and humidity; exposure to winds, frost and sunlight
- plant health, including health indicators, e.g. foliage colour, stem strength, growth pattern
- establishment needs of plants, including bulbs, planting rate, plant spacing, seed spacing, transplanting and pricking out
- target plant populations, planting depth.

A2 Requirements for growth

Importance and effectiveness of methods used to promote plant growth at different growth stages.

- Changes in requirements for healthy growth at different growth phases, including germination, emergence, elongation, flowering, fruit and seed production.
- Environmental conditions needed throughout the growing period, to include temperature and the effects of temperature change; space and lighting levels needed to support growth; moisture and oxygen levels that promote good growth; soil type; aspect.
- Support mechanisms for growing plants, e.g. trellis, canes, stakes.

Learning aim B: Apply cultivation methods for plant husbandry and growth

B1 Cultivation methods

- Methods of cultivation, to include primary, secondary, deep cultivation, double digging, rototilling, non-inversion, consolidation.
- Optimum timing of cultivation and its benefits – spring, autumn, natural weathering.
- Benefits of cultivating soil, to include moisture conservation, soil structure, soil damage, soil improvement.
- Cultivation equipment, to include hand tools, e.g. spade, fork, trowel, hoe; powered machinery, e.g. rototiller, roller.
- Cultivating settings, width of machine, depth of cultivation, to include deep and shallow working depths.

B2 Planting systems

The use and effectiveness of planting systems, and factors affecting their selection in different situations.

- Rotations and choice of plants used within a sequence.
- Monoculture and intercropping.
- Planting styles for different systems, to include formal, informal, border, cottage garden, prairie garden.

Learning aim C: Carry out routine husbandry tasks to maintain the health and growth of plants

Selection and use of practical husbandry techniques to optimise plant health.

C1 Working safely

- Responsibilities for personal safety under the Health and Safety at Work etc. Act 1974.
- Use of personal protective equipment (PPE), to include boots, coveralls, gloves, face shield, ear defenders.
- Care required when working with plants, including potentially harmful plants, e.g. spines, stings; safe lifting techniques for carrying heavy items, bending to work at low levels, working with chemicals.

C2 Feeding and watering requirements

- Watering routine – amount and frequency, impact on plant health, signs of distress.
- Application methods used in watering plants, e.g. watering can, drip system, irrigation.
- Sources of nutrition, to include artificial, natural, feed in water.
- Role of nutrition elements, to include major nutrients (nitrogen (N), phosphorus (P), potassium (K)), minor nutrients (calcium (Ca), iron (Fe), magnesium (Mg), sulphur (S)), trace elements (copper (Cu), zinc (Zn), molybdenum (Mo), boron (B)).
- Elements from soil, water and the atmosphere, carbon (C), hydrogen (H), oxygen (O).
- Macronutrients: nitrogen, phosphorus, potassium, calcium, magnesium, sulphur.
- Micronutrients: boron, chlorine (Cl), copper, iron, manganese, molybdenum, zinc, nickel (Ni).
- Timing of nutrient application, to include early growth, mid growth, flowering and fruit production.

C3 Temperature, ventilation and plant protection

Correct selection and control of factors that optimise growing conditions for good plant health and growth.

- Sources of ventilation, to include artificial, natural, when ventilation is needed and its benefits to the plant.
- Temperature recording, to include the effects of high/low temperature, ambient temperature, relative humidity.
- Monitor and record temperatures and level of ventilation given to plants.
- Protection against elements, to include frost, temperature variation and fluctuation, problems caused by the elements, growth habits.
- Removal of weeds; chemicals, including herbicides and selective herbicides; cultural methods.
- Equipment used in protecting the plant, to include fleeces, nets, canes, stakes, string, ties and cloches.
- Importance of monitoring and recording the plant health and husbandry methods applied, and actions to take if any problems occur, including remedial action for plant protection problems such as an increase or decrease in ventilation, fluctuations in temperature.

Assessment criteria

<table>
<tr><th>Pass</th><th>Merit</th><th>Distinction</th></tr>
<tr><td colspan="2">Learning aim A: Understand planting and growing requirements to support the healthy growth of plants</td><td rowspan="2">A.D1 Analyse the requirements for the establishment and growth of plants, and show how this has a direct effect on successful plant husbandry.</td></tr>
<tr><td>A.P1 Explain the basic requirements to support the healthy growth of plants.
A.P2 Explain the different factors that can affect the establishment and growth of plants.</td><td>A.M1 Assess the requirements for planting and growing healthy plants, and the factors that affect their establishment and growth.</td></tr>
<tr><td colspan="2">Learning aim B: Apply cultivation methods for plant husbandry and growth</td><td rowspan="4">B.D2 Evaluate the systems used in the cultivation and planting of different species of plant.

C.D3 Record and review the methods used for plant protection, and make recommendations for improvement to promote higher standards of care.</td></tr>
<tr><td>B.P3 Explain the different planting systems used to promote good plant husbandry.
B.P4 Select and use cultivation methods to prepare for plant growth.</td><td>B.M2 Assess different planting and cultivation systems that ensure good health in plants.
B.M3 Select and use appropriate cultivation and planting methods to prepare for plant growth.</td></tr>
<tr><td colspan="2">Learning aim C: Carry out routine husbandry tasks to maintain the health and growth of plants</td></tr>
<tr><td>C.P5 Demonstrate the provision of basic plant husbandry and protection which are in line with health and safety standards.
C.P6 Produce outline records on the health and growth of plants.</td><td>C.M4 Demonstrate the provision of routine plant husbandry and protection for different plant species, keeping detailed records of their health and growth.</td></tr>
</table>

Essential information for assignments

The recommended structure of assessment is shown in the unit summary along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of two summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aim: A (A.P1, A.P2, A.M1, A.D1)

Learning aims: B and C (B.P3, B.P4, C.P5, C.P6, B.M2, B.M3, C.M4, B.D2, C.D3)

Further information for teachers and assessors

Resource requirements

For this unit, learners must have access to:

- a wide range of annual, biennial and perennial plants
- a suitable area for cultivating and establishing plants
- a range of tools/equipment to be used for the cultivation and establishing of plants.

Essential information for assessment decisions

Learning aim A

For distinction standard, learners will demonstrate an in-depth understanding of the planting and growing requirements needed to support the healthy growth of plants. This will include examples from a broad range of different types of plants. They will make clear and relevant links between the factors affecting the growth of plants to successful plant husbandry. Learners' work will be structured, making valid and well-supported judgements, and using clear and accurate terminology.

For merit standard, learners will demonstrate a detailed understanding of the requirements for plant growth, using examples from a range of different types of plants. They will explain most of the factors that affect their establishment and growth. They will also explain establishment techniques and growth requirements, and how the techniques affect plant growth commercially. Learners will produce clearly written evidence supported by mainly relevant examples, and the work will contain reference to appropriate terminology.

For pass standard, learners will give an explanation of the requirements needed to support the healthy growth and development of plants. They will explain, but may have limited knowledge of, the different establishment techniques and the growth requirements needed for plants. There may be some minor inaccuracies and some terminology may be omitted.

Learning aim B and C

For distinction standard, learners will fully consider different types of cultivation and the impact this can have on planting different species. They will carry out their chosen cultivation activities confidently while preparing mediums for planting. They will also give a clear rationale regarding the requirements of plant food and water and ventilation and temperature.

They will demonstrate they can select and work with a range of irrigation systems and plant treatments appropriate for different plants and species. They will reflect on their progress and make recommendations where appropriate of ways to further improve the standard of care of the plants.

For merit standard, learners will give a clear assessment of cultivation methods and they will carry out cultivation in a safe and appropriate manner while preparing mediums for planting.

They will demonstrate they can work with more complex irrigation systems and provide plant protection and apply treatments for a range of plants. Learners will give due care and consideration to the health and safety requirements for themselves and others.

For pass standard, Learners will provide explanations of some of the cultivation and planting systems that can be used to ensure good plant husbandry and will select and use some appropriate techniques when preparing mediums for planting.

Learners will demonstrate they can deliver feed and water through a simple irrigation system and provide some elements of plant protection and treatments. Learners will give due care and consideration to the health and safety requirements of themselves and others.

Links to other units

This unit links to:

- Unit 6: Identification, Planting and Care of Plants
- Unit 8: Plant Propagation Activities.

Employer involvement

This unit would benefit from employer involvement in the form of:

- masterclasses
- technical workshops involving staff from local land-based organisations
- contribution of ideas to unit assignment/project materials
- observation during work experience
- support from local land-based organisation staff as mentors.

Unit 8: Plant Propagation Activities

Level: **3**

Unit type: **Internal**

Guided learning hours: **60**

Unit in brief

Learners develop the skills to plan for the propagation and establishment of a range of plants, using a wide range of seed and vegetative propagation techniques.

Unit introduction

Horticulturalists often need to plan and propagate plants for a range of different purposes, which could be for conservation for the natural world and rare species, for crop production, or the supply of decorative plants for amenity areas and green spaces.

In this unit, you will draw on the skills and knowledge you have developed across the programme, to plan for and propagate a range of plants. You will put together propagation schedules, planning the type of structure, equipment and facilities necessary for a range of plants. You will then apply seed and vegetative propagation techniques for their specific requirements and provide aftercare for your propagated plants so they establish successfully. To complete the assessment task within this unit, you will need to draw on your learning from across your programme.

This unit will help you to develop the skills for a number of roles in the horticulture sector, such as a gardener, nursery worker, propagation scientist or plant breeder. You could also progress to advanced apprenticeships, or to higher education courses in horticulture.

Learning aims

In this unit you will:

A Explore the factors affecting successful plant propagation to produce propagation schedules

B Undertake seed and vegetative propagation to meet production requirements

C Undertake the aftercare of propagated plants to achieve successful establishment.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Explore the factors affecting successful plant propagation to produce propagation schedules	**A1** Environmental conditions necessary for propagation **A2** Physical structures for managing the propagation environment **A3** Planning schedules for targeted plants	A report on the environmental conditions and facilities needed to enable the production of propagation schedules for two named plants. Propagation schedules.
B Undertake seed and vegetative propagation to meet production requirements	**B1** Collection and preparation of propagation material **B2** Preparing growing media for propagation **B3** Establishing propagation material in the propagation environment	Evidence includes: • Photographic evidence of propagation and aftercare tasks carried out covering both seed and vegetative methods, supported by a log detailing the techniques used. • Photographic evidence of the initial aftercare, ongoing plant care supported by learners' monitoring records.
C Undertake the aftercare of propagated plants to achieve successful establishment	**C1** Initial aftercare **C2** Ongoing plant care and monitoring	

Content

Learning aim A: Explore the factors affecting successful plant propagation to produce propagation schedules

A1 Environmental conditions necessary for propagation

Environmental manipulation to enhance the propagation of propagules (cuttings, seeds).

- Environmental factors (microclimatic conditions) in the immediate vicinity of the propagule during propagation:
  - relative humidity, to include intermittent mist and turgor for growth processes
  - temperature, to include both aerial and base heat
  - gases and gas exchange, including oxygen, carbon dioxide, ethylene
  - light, including photoperiod, light quality.
- Factors influenced by the soil or propagation medium (edaphic factors):
  - propagation medium or soil
  - mineral nutrition, e.g. fertigation, controlled-release fertilisers
  - water.
- Biotic factors, to include the interaction of propagules with other organisms such as beneficial bacteria, mycorrhizal fungi, pathogens, insect pests, weeds.

A2 Physical structures for managing the propagation environment

The types of structure available and their purpose in the land-based sector.

- Structures, e.g. greenhouses, germination rooms, propagation frames.
- Equipment, e.g. mist and fog units, heated bins, hot-pipe grafting facilities.
- Covering materials, e.g. glass, polyethylene, polycarbonate.
- Construction materials, e.g. aluminium, galvanised iron or steel, wood.

A3 Planning schedules for targeted plants

Planning, in order to coordinate time, resources, labour, and space to produce healthy plants on time.

- Planning components:
  - available space
  - crop layout based on the number of plants required
  - schedule of propagule collection and processing, of propagule treatment, of propagule establishment
  - growing schedule to meet target date for delivery of finished plants.
- Propagation protocols to coordinate the production of all crops being grown simultaneously:
  - species name and ecotype
  - duration required to grow to targeted plant specification
  - target specifications, e.g. height, root system, stem diameter
  - propagule collection, e.g. 'true to type', time of year
  - propagule processing, e.g. cleaning techniques of seed, scarification
  - approximate crop timing, e.g. sowing to transplanting
  - growing area required, e.g. heated bench, seedbed, use of low tunnels
  - sowing and cutting process
  - approximate crop timing, e.g. sowing to transplanting
  - growing, to include feeding, growth regulation, temperature and pH control, pack or pot size, planting out, common diseases and pests.

Learning aim B: Undertake seed and vegetative propagation to meet production requirements

B1 Collection and preparation of propagation material

- Health and safety procedures when working outside and in propagation facilities:
  - personal protective equipment (PPE)
  - preparation and use of risk assessment
  - correct selection, use, transport and carrying of tools and equipment for carrying out tasks
  - safe working procedures to ensure protection of self and others.
- Correct use and maintenance of tools and equipment, including cleaning and storage.
- Collection and preparation of plant material for propagation:
  - seed, e.g. dehiscent, indehiscent
  - vegetative material, to include perennials, e.g. herbaceous, hardy and woody trees and shrubs.
- Practical management techniques, e.g. handling, pruning, cutting.
- Processing, e.g. soaking, maceration, drying.
- Overcoming seed dormancy, e.g. scarification, stratification.
- Storage, e.g. length of storage, temperature regimes, packaging.
- Management of stock plants to promote juvenile or adult material, e.g. routine and formative pruning techniques.
- Recognition of the most appropriate plant material to select, to include 'true to name, type and form', of appropriate size, free from environmental and physiological disorders, pest-, disease- and weed-free.
- Information for recording purposes in propagation logs or crop records, e.g. information on provenance, treatments, date of sowing.
- Plant health regulations, e.g. plant passports, phytosanitary certificates, biosecurity.

B2 Preparing growing media for propagation

- Preparation of raised seedbeds, to include aeration and drainage; amelioration; enhancement by added mycorrhizae or similar, to include consolidation, levelling and pest protection.
- Composts for seeds, seedling and transplants:
  - recognition of compost formulas, to include loam-based and loamless seed and cutting mixes
  - preparation by hand or mechanical means
  - aggregate range used such as sterilised loam, peat, coir, rock wool, bark, perlite, vermiculite, horticultural sand or grit.
- Seed propagation:
  - sowing techniques, to include in situ; use of containers and nursery beds; manual, e.g. placement; broadcast or mechanical sowing methods, e.g. seedling machines
  - positive effects moisture, oxygen levels, temperature, seed viability, provenance and light on germination rates
  - methods used to enhance the environmental conditions required for optimum germination, e.g. use of germination cabinets, soil cultivation techniques.
- Vegetative propagation:
  - propagation techniques, to include division, cuttings; softwood, semi-ripe, hardwood, root, leaf or leaf section and leaf bud, layering and grafting, e.g. apical, side, 'T' chip
  - micropropagation, to include stages of propagation through to the weaning stage
  - recognition of natural vegetative means, to include bulbs, corms, stolons, stem tubers, plantlets and foliar embryos
  - methods used to enhance the environmental conditions required for optimum root and/or shoot production, to include growth regulators, wounding, mist units, closed cases, low polythene tunnels, covers, growth rooms and heated benches , closed floors.

B3 Establishing propagation material in the propagation environment

- Structures, e.g. tunnels, germination cabinets and rooms, glasshouses, outdoor cutting beds.
- Equipment, e.g. mist and fog units, heated bins, beds and benches, hot-pipe grafting facilities, lined-out rootstock beds for budding and grafting.
- Covering materials, e.g. glass, polyethylene, net.
- Establishment of plants, to include:
  - the control of moisture, e.g. systems, humidity levels, ventilation
  - light levels, shade
  - hygiene
  - pest, disease, disorders and weeds
  - germination and rooting
  - completion of records, e.g. propagation log, crop record.

Learning aim C: Undertake the aftercare of propagated plants to achieve successful establishment

C1 Initial aftercare

Carry out aftercare to achieve successful establishment.

- Plant protection, including support, e.g. stakes, ties, frames for protection from animals, people and weather.
- Initial aftercare to ensure successful establishment, to include feeding, watering, pruning, disposal of organic and inorganic waste, recycling materials.
- Recognition of the positive effect weaning plants has on the quality of the plants produced.

C2 Ongoing plant care and monitoring

- Factors to consider in aftercare and monitoring of plants and the propagation environment:
  - watering
  - control of moisture, e.g. humidity levels, ventilation
  - controls to include aerial and base temperature, light and shade, hygiene, gaseous control
  - removal of damaged, dying and decaying material
  - prevention and control of pests, diseases, weeds and disorders
  - germination and rooting.
- Practical aftercare management techniques, to include trimming and pinching back, separation, thinning, pricking out, transplanting, potting up.
- Development of plants for sale or use in the landscape, selection of containers, growing media, fertiliser, irrigation methods, support, potting depth trimming; stand down and set out stock on benching or ground as necessary, outdoors, under protection, straight lines, spacing.
- Completion of appropriate records, e.g. propagation record, growing-on log, crop records to enable reviews.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Explore the factors affecting successful plant propagation to produce propagation schedules		
A.P1 Explain the environmental conditions and the facilities needed for seed and vegetative propagation of plants. **A.P2** Produce simple propagation schedules for the seed and vegetative propagation of specified plants.	**A.M1** Assess the factors that affect successful propagation, producing detailed propagation schedules for the seed and vegetative propagation of specified plants.	**A.D1** Analyse the factors that affect successful propagation, producing comprehensive propagation schedules for the seed and vegetative propagation of specified plants.
Learning aim B: Undertake seed and vegetative propagation to meet production requirements		
B.P3 Carry out basic seed and vegetative preparation and propagation activities for specified plants. **B.P4** Carry out simple establishment of propagation material for propagated plants.	**B.M2** Carry out seed and vegetative propagation and establishment activities efficiently, working to the required timelines and using appropriate techniques.	**B.D2** Carry out seed and vegetative propagation and establishment activities effectively, demonstrating a comprehensive understanding of the techniques required for the specified plants.
Learning aim C: Undertake the aftercare of propagated plants to achieve successful establishment		
C.P5 Carry out plant maintenance and aftercare activities competently for specified propagated plants. **C.P6** Explain the approaches used in the weaning process and its impact on plant quality.	**C.M3** Carry out plant maintenance and aftercare activities efficiently for specified propagated plants. **C.M4** Assess the approaches used in the weaning process and its impact on plant quality.	**C.D3** Carry out effective plant maintenance and aftercare for specified propagated plants, evaluating approaches used in the weaning process.

Essential information for assignments

The recommended structure of assessment is shown in the unit summary along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of two summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aim: A (A.P1, A.P2, A.M1, A.D1)

Learning aims: B and C (B.P3, B.P4, C.P5, C.P6, B.M2, C.M3, C.M4, B.D2, C.D3)

Further information for teachers and assessors

Resource requirements

For this unit, learners must have access to:

- a range of common materials and specialist hand tools, including power tools and testing equipment
- suitable PPE
- access to a suitable range of environmental-control equipment and systems
- regular access to a range of physical structures and open ground to carry out propagation and growing tasks
- regular access to a range of plant material for propagation and maintenance.

Essential information for assessment decisions

Learning aim A

For distinction standard, learners will give a thorough and detailed account of the environmental conditions and facilities needed for the successful propagation and establishment of plants, using both seed and vegetative methods. Learners will support their account with well-considered examples. They will demonstrate depth and breadth of knowledge and understanding, drawn from across the learning aims, to provide clear and logical reasoning as to how physical structures affect the choice of propagation method.

Learners will produce comprehensive propagation schedules for two seed and two vegetatively propagated plants. The schedules will include detailed and accurate timescales, detailed reasoning for the resources required, and contingency planning to ensure the successful propagation and establishment of the plants. It will be clear that learners have a depth of understanding of the appropriate preparation and propagation techniques to be used to meet the requirements of the specified plants. Learners will include possible risks and how these can be minimised. They will use accurate technical terminology confidently and consistently.

For merit standard, learners will give a detailed account of the environmental conditions and facilities needed for the successful propagation and establishment of plants, using both seed and vegetative methods. Learners will support their account with relevant examples. They will show an understanding of how physical structures affect the choice of propagation method.

Learners will produce propagation schedules for two seed and two vegetatively propagated plants, which cover, in detail, resources required, timescales and the preparation and propagation techniques to be used. The schedules will show a clear relationship between the methods selected and intended plant use. Learners will include some details on how to manage risk.

It will be clear from the schedules that learners have an understanding of all stages leading to propagation, and they will have a good knowledge of the connections between temperature regimes, growing media, growth regulation, pack or pot size, and common diseases and pests. Learners will use mostly accurate technical terminology.

For pass standard, learners will demonstrate a realistic awareness of the environmental conditions and facilities needed for the successful propagation and establishment of plants, using both seed and vegetative methods. They will demonstrate some understanding of how the environment can be manipulated depending on physical facilities, including greenhouses, cladding materials such as glass, and construction materials such as aluminium.

Learners will produce simple propagation schedules to support the development of two seed and two vegetatively propagated plants. They will plan the key activities with a timeline and some resources but will not include all detail. Learners will include some reference to risks.

From the schedules it will be clear that learners have a basic knowledge of the connections between temperature regimes, growing media, container size, timings and potential pests and diseases. Learners will use some technical terminology but there may be some inconsistencies.

Learning aims B and C

For distinction standard, learners will carry out propagation, establishment and aftercare that is effective in supporting the development of the specified plants. They will evidence clear ways to minimise risks and fully demonstrate competent safe working practices throughout. Learners will select correct tools, materials and equipment, using them safely and to a high standard. They will draw on knowledge from their learning to reflect on the decisions they made when carrying out practical tasks. Learners will demonstrate an in-depth understanding of the plants they are working with and their requirements before propagation, during propagation and when providing aftercare and the positive effect weaning plants has on the quality of the plants produced.

Learners will review the techniques they used for propagation and aftercare to explore thoroughly where they were successful and where techniques could be improved or carried out differently. This will show a depth of understanding of the impact tasks have on structures, facilities, the management of integrated pest management, and intended use, such as for hedging, specimen trees, successional bedding or mixed borders.

For merit standard, learners will carry out propagation, establishment and aftercare, showing they have optimised the given area through their preparation and by demonstrating efficiency in the time taken, the resources used, and the minimal disruption during the processes. They will assess the hazards and risks involved in carrying out the practical tasks and use the required tools, materials and equipment safely and competently.

Learners will show detailed knowledge of individual plant requirements in order to provide aftercare that helps to support successful establishment. They will demonstrate an understanding of the weaning process and how it impacts on plant quality. Learners will reflect on the methods they used and make clear connections to their impact on the successful establishment of plants.

For pass standard, learners will carry out propagation, establishment and aftercare, showing they can work safely, with an awareness of the potential risks and ensuring others are not in danger from their activities. Learners will use required materials, tools and equipment, leaving the area clean and tidy on completion and disposing of waste materials appropriately. They will show an awareness of the need to provide suitable environmental controls through the use of appropriate structures and facilities. Learners will show a realistic awareness of the weaning process, making some links with its impacts on plant quality. They will provide reasons for their selected methods of planting and aftercare, demonstrating some understanding of the impact these methods have on the successful establishment of plants.

Links to other units

This unit links to:

- Unit 1: Professional Working Responsibilities
- Unit 4: Work Experience in the Land-based Sectors
- Unit 6: Identification, Planting and Care of Plants.

Employer involvement

This unit would benefit from employer involvement in the form of:

- masterclasses
- technical workshops involving staff from local land-based organisations
- contribution of ideas to unit assignment/project materials
- observation during work experience
- support from local land-based organisation staff as mentors.

Unit 9: Tree and Shrub Pruning and Maintenance

Level: **3**

Unit type: **Internal**

Guided learning hours: **60**

Unit in brief

Learners develop skills in pruning and maintaining trees and shrubs, assessing them for potential failure and suggesting remedial solutions.

Unit introduction

Trees and shrubs are a much loved and standard part of the landscape. It is vital, therefore, that they are managed properly to maintain or enhance their aesthetic value, guarantee or increase their longevity, and ensure that they do not pose any risks to the people or property around them.

In this unit, you will learn how pruning may be used to manage the growth and development of a range of trees and shrubs, and how pruning techniques will vary according to plant species, age, situation and intended purpose. You will learn the techniques and procedures used to prune trees and shrubs, and then carry out this work safely and effectively. You will also learn how to assess the health of trees and shrubs, to recognise structural and pathological causes of potential failure, and to determine and carry out the appropriate remedial action.

This unit will help you to progress to further horticulture courses in higher education, or to apprenticeships or entry-level roles in the horticulture sector.

Learning aims

In this unit you will:

A Explore how pruning is used as a means of maintaining trees and shrubs

B Investigate how trees and shrubs are assessed for potential failure

C Carry out pruning and maintenance activities on trees and shrubs.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Explore how pruning is used as a means of maintaining trees and shrubs	**A1** Reasons for pruning and maintaining trees and shrubs **A2** Pruning techniques **A3** Considerations when pruning	A report on the importance of the pruning and maintenance of trees and shrubs, the techniques involved, and how to assess and treat trees and shrubs for potential failure.
B Investigate how trees and shrubs are assessed for potential failure	**B1** Assessing trees and shrubs for potential failure **B2** Remedial action to reduce risks of tree failure	
C Carry out pruning and maintenance activities on trees and shrubs	**C1** Pruning requirements **C2** Planning the pruning operation **C3** Carry out appropriate pruning	A log that covers the pruning and maintenance activities, with photographs and written commentary explaining the processes carried out.

Content

Learning aim A: Explore how pruning is used as a means of maintaining trees and shrubs

A1 Reasons for pruning and maintaining trees and shrubs

- Promoting and maintaining the health of trees and shrubs.
- To reduce the spreading of diseases, e.g. coral spot, Dutch elm disease.
- To maintain plant vigour, balance and structural stability.
- To improve the aesthetics of the plant.

A2 Pruning techniques

- Formative pruning – preparing and getting the shape in the early stages of tree development.
- Tree pruning techniques, including crown thinning, crown reduction, crown lifting, and crown cleaning.
- Pruning techniques for trees and shrubs, including pollarding, coppicing, rejuvenation, root pruning.

A3 Considerations when pruning

- The required outcome, e.g. from the client, park manager.
- The seasonality and timing of pruning techniques for the type of tree/shrub.
- The selection of the appropriate technique suitable for the tree type within its particular growing area.
- The landscape where the tree/shrub sits.
- The legal considerations in terms of tree, planning and conservation regulations.
- The health and safety of operatives, and regulations around working at heights, harnessing, and personal liability insurance.

Learning aim B: Investigate how trees and shrubs are assessed for potential failure

B1 Assessing trees and shrubs for potential failure

Carrying out a risk assessment around the probability of tree failure:

- assessing potential failure area of trees dependent on tree type
- consideration of the form and branching characteristics
- evidence of structural weakness and imbalance
- impact of local construction work, changes in soil levels, potential hazards to public and property.

B2 Remedial action to reduce risks of tree failure

Possible solutions and considerations for remedial action:

- removal or pruning options outlined
- physical support, including propping, guying, bracing
- site improvement
- costs and benefits of remedial action proposed
- long- and short-term consequences
- consideration of health and safety legislation.

Learning aim C: Carry out pruning and maintenance activities on trees and shrubs

C1 Pruning requirements

- Methods of assessing pruning requirements and species identification, including plant characteristics consisting of natural size and form, age, vigour, health and physical damage.
- Seasonal pruning requirements in relation to aesthetic considerations and health and safety considerations.

C2 Planning the pruning operation

- Close the site, clear up, cordon sections off, give advance warning and notices.
- Planning the pruning operation – to carry out and consider
  - risk assessment
  - weather conditions
  - access arrangements
  - public safety.
- Selecting appropriate pruning tools and equipment, e.g. types of hand tools.
- Access to equipment and personal protective equipment (PPE).

C3 Carry out appropriate pruning

- Using the appropriate methods, prune trees and shrubs appropriately according to their age, size and desired effect/use within the landscape.
- Pruning different plants, including evergreen shrubs, deciduous shrubs, hedges, wall shrubs, roses and trees.
- Site management in maintaining health and safety, disposal of waste and PPE.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Explore how pruning is used as a means of maintaining trees and shrubs		**A.D1** Evaluate a wide range of pruning techniques and the factors that influence them, analysing their effectiveness in maintaining trees and shrubs.
A.P1 Explain why pruning is important to maintain trees and shrubs. **A.P2** Explain some of the factors that influence the selection of different pruning techniques.	**A.M1** Compare a range of pruning techniques and how they are used to maintain trees and shrubs, assessing their importance and the factors that influence their use.	
Learning aim B: Investigate how trees and shrubs are assessed for potential failure		**B.D2** Analyse the different methods for assessing trees and shrubs for failure, producing detailed solutions for prevention, remedial care and long-term management.
B.P3 Explain the methods used to assess trees and shrubs for failure. **B.P4** Produce outline solutions for how tree and shrub failure may be prevented or remedied.	**B.M2** Compare the different methods for assessing trees and shrubs for failure, producing solutions for how they may be prevented or remedied.	
Learning aim C: Carry out pruning and maintenance activities on trees and shrubs		**C.D3** Carry out thorough assessments for a wide range of trees and shrubs, selecting and using the appropriate tools confidently to complete pruning and maintenance activities.
C.P5 Carry out basic assessments of the pruning requirements for trees and shrubs. **C.P6** Carry out simple pruning and maintenance activities on trees and shrubs.	**C.M3** Carry out accurate assessments of the pruning requirements for a range of trees and shrubs, selecting tools to complete most of the required pruning and maintenance activities.	

Essential information for assignments

The recommended structure of assessment is shown in the unit summary along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of two summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aims: A and B (A.P1, A.P2, B.P3, B.P4, A.M1, B.M2, A.D1, B.D2)

Learning aim: C (C.P5, C.P6, C.M3, C.D3)

Further information for teachers and assessors

Resource requirements

For this unit, learners must have access to pruning tools and equipment.

Essential information for assessment decisions

Learning aims A and B

For distinction standard, learners will demonstrate a thorough understanding of the importance of pruning for the maintenance of trees and shrubs and the techniques involved, supported by a wide range of examples of specific plants, some of which have quite complex requirements. They will provide a comprehensive analysis of the advantages and disadvantages of different pruning techniques and approaches, suggesting improvements or changes that may be necessary to support the health of trees and shrubs. They will give examples of how to assess failure in trees and shrubs, giving detailed recommendations for the remedial action required and how to plan for the long-term management of possible failures. Learners will show throughout that they understand the importance of the legal implications of pruning and maintaining shrubs and trees, both in terms of health and safety and specific legislation relating to planning and conservation.

For merit standard, learners will give clear and detailed information about the importance of the pruning and maintenance of trees and shrubs, supported with a range of examples. They will compare different pruning techniques and their outcomes, making some comments about the suitability, and the effectiveness of the desired outcome. They will give some information about the methods to assess potential failure in trees and shrubs and the remedial action required for them, showing some consideration of the long-term impact and maintenance plan.

For pass standard, learners will give broad reasons for the pruning and maintenance of trees and shrubs, using a small range of examples, showing consideration of the needs of different landscapes. They will provide information on some of the basic methods for assessing potential failure in trees and shrubs, and suggest some suitable remedial action to reduce the failure and long-term loss of the tree/shrub.

Learning aim C

The assessment activity for learning aim C should cover pruning activities for the following types of tree and shrub: evergreen shrub, deciduous shrubs, hedges, wall shrubs, roses and young trees. Tree access techniques and chainsaw use are not required.

For distinction standard, learners will demonstrate confidence in assessing pruning requirements, selecting and using the correct equipment and tools for pruning trees and shrubs, resulting in skilful pruning. They must demonstrate the capacity to adapt techniques to the needs of the specific tree/shrub, such as taking account of natural size, form and age, and how pruning best manipulates the plant to improve the outcome in its habitat, while maintaining high standards of health and safety to self and others. Learners will work autonomously, solving problems efficiently and resourcefully.

For merit standard, learners will assess the requirements of a range of trees and shrubs, selecting and using equipment and tools that are mostly appropriate, and which result in proficient pruning. They will show a consideration of the landscape and of the tree and shrub size and form. They will work mostly without help but may need some guidance for more complex techniques. They will work safely, showing a consideration for the setting and for others present.

For pass standard, learners will demonstrate that they can assess some of the pruning requirements for a small range of trees and shrubs, and use the appropriate tools and equipment to prune them (although they may need some support in selecting them). They will also demonstrate that they can carry out some basic pruning techniques but may need some support in more complex situations.

Links to other units

This unit links to Unit 1: Professional Working Responsibilities.

Employer involvement

This unit would benefit from employer involvement in the form of:

- masterclasses such as gardeners, park managers
- technical workshops on pruning techniques from staff from local land-based organisations
- contribution of ideas to unit assignment/project materials
- observation during work experience
- support from local land-based organisation staff as mentors.

Unit 10: Land-based Machinery Operations

Level: **3**

Unit type: **Internal**

Guided learning hours: **60**

Unit in brief

Learners develop skills in the safe operation of machines used in the land-based sectors, including carrying out pre-start checks, basic maintenance and repair, and actual operation.

Unit introduction

Machines are used throughout the land-based sectors for a range of purposes, including transport and powering or pulling other equipment. The correct selection, maintenance and use of machinery are extremely important to the success of all enterprises and sustainable working practices.

In this unit, you will explore machines relevant to your particular sector of the industry, developing practical skills and understanding of the different conditions in which machinery might need to operate. You will learn how to carry out pre-start checks and maintenance on these machines as well as the safe use and operation of the machine for a variety of tasks. The skills and knowledge gained in this unit will help you to manage the potential dangers involved in operating land-based machinery, and enable you to carry out tasks in a way that prioritises safety and consideration of environmental impact.

This unit will support your progression to employment in the land-based sectors in a role such as machinery operations assistant and assistant technician, or to further study in an apprenticeship or higher education.

Learning aims

In this unit you will:

A Investigate the types, purpose and safe operation of land-based machinery

B Operate land-based machinery safely to complete a practical task

C Maintain land-based machinery safely in order to sustain its effectiveness.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Investigate the types, purpose and safe operation of land-based machinery	**A1** Types of machine and their purpose **A2** Principles of operation **A3** Range of conditions in which machinery may be operated **A4** Health and safety considerations	A report examining machinery types, their uses and operation for a relevant sector of the land-based industries.
B Operate land-based machinery safely to complete a practical task	**B1** Preparation **B2** Operation	Evidence of safe completion of practical tasks that include the preparation and operation of a suitable machine to achieve the task being carried out.
C Maintain land-based machinery safely in order to sustain its effectiveness	**C1** Maintenance **C2** Servicing and repair	Evidence of a machine being checked before and after use, and maintenance requirements being identified. A report evaluating the effectiveness of the preparation, routine maintenance and repair carried out, and the options available to do this.

Content

Learning aim A: Investigate the types, purpose and safe operation of land-based machinery

A1 Types of machine and their purpose

The types of machine available and the purposes for which they are used in the land-based sector.

- Types of machine:
  - tractors, including two- and four-wheel-drive systems, track-layers
  - utility vehicles
  - all-terrain vehicles (ATVs)
  - special purpose vehicles, e.g. self-propelled harvesters or mowers, material handlers
  - pedestrian-operated and hand-held machines.
- Adaptations for different purposes, including working on slopes, inside buildings and on soft or unfirm ground.
- Purposes of machines:
  - transport of goods and people
  - estate maintenance, e.g. brush cutters, hedge cutters, flails
  - pulling other equipment, e.g. trailers, mowers
  - powering attached equipment via external services, e.g. powered cultivators, mowers
  - excavation, e.g. trenching, ditching, landscaping
  - application of materials, e.g. seed, organic material, fertiliser and plant protection products.

A2 Principles of operation

- Available power sources:
  - engines, to include spark ignition, two- and four-stroke cycle, compression ignition, four-stroke and electric motors
  - fuels, to include petrol, diesel, liquid petroleum gas (LPG), biofuels and electricity, including single phase, three phase and battery
  - potential environmental impact of different engine types.
- Drive systems:
  - belts, chains and gearboxes:
    - their characteristics and use
    - advantages and disadvantages
  - hydrostatic systems:
    - their characteristics and use
    - advantages and disadvantages
  - two- and four-wheel-drive systems
  - different and equal-size wheels.
- Machine layout, design and safety features:
  - location of controls for powered machines, e.g. on/off switches, brakes, clutch, throttle/accelerator, gear lever, lights and indicators, operating sequences, emergency stop mechanisms
  - access, including doors, steps, protective covers and guards
  - aspects of sustainability relevant to machine design and layout, e.g. fuel type, fuel efficiency, emissions, noise pollution, and lubrication.
- Ancillary equipment:
  - hitches to attach trailed equipment, e.g. pick-up hitches, clevis drawbars
  - three-point linkage to attach mounted or semi-mounted equipment, e.g. ploughs, mowers and cultivators
  - external services, e.g. electrical, power take-off (PTO), shafts, hydraulics.

- Machine safety features and procedures:
  - safe operating procedures, e.g. starting the machine when it is out of gear, starting the machine with the operator in the driving position
  - safety features to prevent starting of the machine, e.g. out of gear, being on seat, depressed clutch
  - engine stop, e.g. key and fuel cut off
  - access, to include steps and guards
  - other safety features, e.g. anti-reverse for working pedestrian rotary tillers, safety cabs or frames, seat belts.

A3 Range of conditions in which machinery may be operated

- In the field or on site:
  - slopes
  - size of field/working area and topography
  - soil types and ground conditions
  - access.
- Weather and seasonality:
  - drought, wet, rain, snow, normal conditions
  - tasks in relation to time of year and seasons.

A4 Health and safety considerations

Health and safety aspects relevant to the use of machinery in land-based sectors.

- Legislation relevant to the use of land-based machinery:
  - regulations regarding the permission and competence required to carry out certain land-based operations, including:
    - minimum driver age limits
    - Lifting Operations and Lifting Equipment Regulations (LOLER) and Provision and Use of Work Equipment Regulations (PUWER)
    - 'on the road' use of machinery
    - certificates of competence, e.g. spraying, material handling.
- Self-protection and protection of others:
  - Health and Safety at Work etc. Act 1974
  - personal protective equipment (PPE), e.g. safety boots, goggles, overalls, gloves
  - safe systems of work, use of manuals, safe use of controls and cut-outs
  - risk assessments
  - manual handling techniques.
- Potential consequences of not complying with health and safety requirements, such as:
  - injury to self and others
  - prosecution
  - invalidating insurance
  - ineffective and inefficient machines.

Learning aim B: Operate land-based machinery safely to complete a practical task

B1 Preparation

Preparing and checking machines before use and operation.

- Daily checks, adjustment, attachments, lubrication.
- Resources, to include consumables:
  - lubricants
  - cleaning agents, rags and towels
  - variety of tools
  - benches or workshop area.

- Use of PPE.
- Setting up of machine, e.g. position, mixed or draft control, guarding, setting maximum height or depth, working height or depth.

B2 Operation

Operation of relevant machinery in a field or site location.

- Pre-start checks, to include oil, fuel, water, ancillary fittings, tyres, visual checks, lights – where applicable.
- Attachment of equipment, e.g. trailer, link box, mower, spreader or cultivation equipment.
- In-field use, to include starting and stopping, work method, control of attached equipment, forward speed.
- Safe working procedures, e.g. knowledge of operator manual, safe mounting of and dismounting from machine, stopping machine to carry out adjustments and in-field maintenance.
- Aspects of sustainability relevant to machinery operation, e.g. use of energy-saving mode, correct gear and engine speed selection.

Learning aim C: Maintain land-based machinery safely in order to sustain its effectiveness

C1 Maintenance

Carrying out routine operator maintenance.

- Use of operator manuals.
- Understanding service intervals.
- Adjustments of drive devices, e.g. tension chains or belts.
- Checking of tyre pressures.
- Checking of liquids, e.g. fuel, coolant and oil levels, battery electrolyte level.
- Checking of guards for overall fitness for purpose and security of fittings.
- Checking of air filters.

C2 Servicing and repair

- Available options for carrying out servicing and repairs:
  - dealership services
  - in-house servicing and repairs by own mechanic
  - repairs in non-dealership workshop.
- Advantages and disadvantages of the different options for carrying out servicing and repairs, e.g. availability, time, warranty and cost.
- Understanding warranties, their advantages and disadvantages.
- Cost-effectiveness of servicing and repair, routine maintenance and maintenance intervals.
- Identifying faults and problems that require servicing and repair:
  - wear and tear, e.g. worn transmission and steering components, tyres, cutting blades, tines, knives, spark plugs, injectors, blocked filters
  - use of manufacturer part numbers and machine identification
  - health and safety issues, including loose, worn and missing guards.
- Carrying out simple servicing and repair:
  - use of operator's manual
  - renew oils
  - clean or renew filters
  - adjustments, e.g. tensions, pressures
  - maintain and update records of work
  - relevant repairs, e.g. replacement of belts, tines, blades, battery replacement, spark plug or injector replacement, guard replacement
  - recycling or disposing of waste materials and parts in line with accepted practice, e.g. recycling of waste oil, recycling of tyres, use of exchange parts and return.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Investigate the types, purpose and safe operation of land-based machinery		
A.P1 Explain the purpose and operation of different types of land-based machine. **A.P2** Explain the health and safety requirements in the operation of land-based machinery.	**A.M1** Compare the principles of operation of different types of selected land-based machine. **A.M2** Analyse the importance of health and safety requirements in the operation of land-based machinery.	**A.D1** Justify the selection of different types of land-based machinery for a given land-based task.
Learning aim B: Operate land-based machinery safely to complete a practical task		
B.P3 Safely prepare selected land-based machinery for work. **B.P4** Safely operate simple land-based machinery to meet given objectives.	**B.M3** Efficiently use complex land-based machinery to meet given objectives.	**B.D2** Evaluate own operation of land-based machinery against given objectives.
Learning aim C: Maintain land-based machinery safely in order to sustain its effectiveness		
C.P5 Explain the options available for the servicing and repair of land-based machinery. **C.P6** Safely carry out routine operator maintenance and appropriate repairs for a chosen land-based machine.	**C.M4** Assess potential faults on a given land-based machine, using manufacturer's data to specify replacement items during servicing and repair. **C.M5** Carry out efficient routine operator maintenance and appropriate repairs for a chosen land-based machine.	**C.D3** Evaluate the effectiveness of techniques used to carry out routine maintenance and repair, and the options available to do this.

Essential information for assignments

The recommended structure of assessment is shown in the unit summary along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of three summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aim: A (A.P1, A.P2, A.M1, A.M2, A.D1)

Learning aim: B (B.P3, B.P4, B.M3, B.D2)

Learning aim: C (C.P5, C.P6, C.M4, C.M5, C.D3)

Further information for teachers and assessors

Resource requirements

For this unit, learners must have access to:

- a range of common and specialist hand tools, including power tools and testing equipment
- suitable PPE
- a range of prime movers, including tractors and ride-on mowers and transporters
- a range of compatible attachments, including trailers and three-point linkage mounted equipment
- a flat, level site on which to operate
- basic workshop facilities, including vices, benches, fuels and lubricants.

Essential information for assessment decisions

Learning aim A

For distinction standard, learners will thoroughly investigate the machines available to a relevant sector of the land-based industry and fully justify the selection of two different types of machine for given tasks in a way that is logical, coherent and considers all relevant factors. The task will require the selection of some form of ride-on prime mover such as a tractor, haulage/transport vehicle or ride-on machine such as a mower. Evidence will display the accurate use of relevant terminology throughout to support a considered, well-reasoned response. Learners will make insightful references to the role of health and safety in the selection of different types of machines. Learners will meticulously investigate the problems associated with different conditions of use, produce robust, convincing solutions to these problems and make comprehensive, accurate references to relevant aspects of health and safety and sustainability.

For merit standard, learners will provide a clear, balanced review of the principles of operation of land-based machines and report on the principles of operation of two different machines for given tasks in the land-based sector. The task will require the selection of some form of ride-on prime mover such as a tractor, haulage/transport vehicle or ride-on machine such as a mower. The evidence provided will be technically accurate and compare clearly the principles of operation of the two machines. The solutions given by learners will be efficient and suitable. Clear and relevant consideration will be given to aspects of health and safety and sustainability. Learners' evidence will show relevant and accurate analysis of each machine and make use of appropriate technical language. Learners will explore the problems caused by different conditions and provide relevant justifications of their design solutions. Learners will provide a balanced, clear analysis of the importance of health and safety requirements in machine operation.

For pass standard, learners will examine the machines available to the land-based sectors and explain the selection of two different machines for given tasks. The task will require the selection of some form of ride-on prime mover such as a tractor, haulage/transport vehicle or ride-on machine such as a mower. Most of the evidence will be technically accurate and relevant. Learners will report on the suitability of the machines for a range of conditions. Their response might be limited in scope or unbalanced in parts but will be mostly appropriate, including realistic, specific references to health and safety, and limited but appropriate references to sustainability.

Learning aim B

For distinction standard, learners will evaluate the qualitative standard of practical work undertaken to achieve the completion of tasks against the given objectives, which include meeting relevant health and safety requirements. Learners will support their views with well-reasoned, convincing judgements. Learners will provide specific, well-selected evidence to show how and why their work meets the given requirements, making logical, robust connections between their performance and the given brief.

Learners will demonstrate use of complex machinery, requiring multiple operations and use of appropriate equipment. The evidence will include the use of power take-off (PTO)-powered three-point linkage mounted equipment. Tasks will be undertaken efficiently, accurately and completely, meeting the specification requirements. Learners will work safely to a professional industry standard and they will comply with best workplace practice at all times.

For merit standard, learners will safely carry out tasks involving complex machinery that requires multiple operations, using appropriate equipment and a variety of tools and materials. Learners will demonstrate the use of PTO-powered three-point linkage mounted equipment. Learners will show clear evidence of both preparing and operating complex land-based machinery to meet given objectives. Tasks will be undertaken efficiently, accurately and completely, meeting the specification requirements. Learners will work to the standard of a competent employee.

Learners will demonstrate best workplace practice by working safely and in accordance with relevant legislation, ensuring the workplace is prepared and cleared. They will understand the need for, and demonstrate, correct tool, material and equipment procedures, including selection, use, transport, maintenance and storage.

For pass standard, learners will undertake tasks competently, safely and completely, meeting the specification requirements. Learners will safely prepare and operate simple land-based machines such as ride-on mowers and tractors for haulage. They will work to the standard of a novice employee.

Learners will demonstrate acceptable workplace practice by working safely and in accordance with relevant legislation, ensuring the workplace is cleared after task completion. They will demonstrate mostly correct tool, material and equipment procedures, including selection, use, transport, maintenance and storage.

Learners will show a realistic understanding of how different operator techniques may be used, although some aspects of their understanding might be limited in scope.

Learning aim C

For distinction standard, learners will review thoroughly the effectiveness of the techniques and workshop practices used to undertake the completion of tasks, supporting their views with well-reasoned judgements that cover all relevant factors. Learners will evaluate and report on how the techniques and practices used resulted in routine operator maintenance and repair being undertaken efficiently, accurately and completely. Learners will similarly provide an in-depth evaluation of the options available to carry out routine operator maintenance and repair, providing specific reasons that link logically to their views. Learners will dispose of any waste materials in a manner that fully complies with accepted practices and which shows full regard for the concepts and practices of sustainability. Evidence will use relevant and accurate terminology throughout, which supports a considered, comprehensive response.

For merit standard, learners will undertake tasks efficiently, accurately and completely, meeting the specification. Learners will proficiently, without errors, carry out routine maintenance and repair tasks, using appropriate equipment and a variety of tools and materials. They will work to the standard of a competent employee.

Learners will demonstrate best workplace practice by working safely and in accordance with relevant legislation, ensuring that the workplace is prepared and cleared. They will understand the need for, and demonstrate, correct tool, material and equipment procedures, including selection, use, transport, maintenance and storage. Learners will dispose of any waste materials in a manner that fully complies with accepted practices.

Learners will demonstrate clear understanding of the options for repair and maintenance by correctly assessing and reporting on potential faults in a machine and using the manufacturer's data to correctly specify replacement parts. Learners' assessment will be clear and technically accurate. They will use appropriate technical language in their evidence but this may be inconsistent.

For pass standard, learners will demonstrate that they can work safely and completely, meeting the specification requirements. There may, however, be a few minor inaccuracies or inefficiencies. They will carry out simple routine operator maintenance tasks, requiring few operations and a limited range of tools and materials. They will work to the standard of a novice employee.

Learners will demonstrate acceptable workplace practice by working safely and in accordance with relevant legislation, ensuring that the workplace is cleared after task completion. They will demonstrate correct tool, material and equipment procedures, including selection, use, transport, maintenance and storage. Any waste materials will be disposed of in line with acceptable working practices.

Learners will give realistic but limited explanations of the options available for the servicing and repair of machinery, using some technical language.

Links to other units

This unit links to Unit 1: Professional Working Responsibilities.

Employer involvement

This unit would benefit from employer involvement in the form of:

- masterclasses
- technical workshops involving staff from local land-based organisations
- contribution of ideas to unit assignment/project materials
- observation during work experience
- support from local land-based organisation staff as mentors.

Unit 11: Nursery Stock Production

Level: **3**

Unit type: **Internal**

Guided learning hours: **60**

Unit in brief

Learners develop the skills to carry out tasks to successfully establish and maintain nursery stock.

Unit introduction

The nursery industry forms a significant sector of the UK horticultural industry. Nurseries grow and sell plants for private or commercial use, either selling wholesale or directly to customers online or through garden centres and other retail outlets. A nursery can produce stock grown and cultivated in fields or produced in containers and greenhouses.

In this unit, you will explore the range of field- and container-grown crops and plants, and their particular requirements for growth such as soil type and pH, slope of the land, climate, water quality, and access to irrigation and availability of labour. You will consider the various methods of maintaining and controlling growth, and how to deal with common pests and diseases. You will then put together a plan and timeline for some nursery stock and carry out the tasks required to establish and maintain it.

This unit will help you to progress to further horticulture courses in higher education, or to apprenticeships or entry-level roles in nurseries.

Learning aims

In this unit you will:

A Explore the requirements for the production and establishment of field- and container-grown nursery stock

B Plan for the management and establishment of given field and container nursery stock

C Undertake production and establishment activities for specified nursery stock.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Explore the requirements for the production and establishment of field- and container-grown nursery stock	**A1** Plant suitability for field- and container-grown nursery stock **A2** Site selection and growing conditions for nursery stock **A3** Resource requirements **A4** Factors affecting the management of plant growth and establishment	A report on the requirements and factors for the production and establishment of field and container plants as nursery stock.
B Plan for the management and establishment of given field and container nursery stock	**B1** Planning for nursery stock production	Planning documents showing the timelines of activities that cover the key tasks, techniques and factors for the production and establishment of field-grown and container-grown nursery stock. A portfolio of evidence of practical tasks carried out.
C Undertake production and establishment activities for specified nursery stock	**C1** Cultivation, establishment and harvest of nursery stock	

Content

Learning aim A: Explore the requirements for the production and establishment of field- and container-grown nursery stock

A1 Plant suitability for field- and container-grown nursery stock

Categorising plants into field and container grown, considering age, size and intended market.

- Plant types:
  - trees, including fruit and ornamental
  - shrubs, including evergreen and deciduous
  - fruit bushes/canes
  - conifers
  - hedging plants
  - climbers
  - herbaceous perennials
  - heathers
  - grasses
  - alpines
  - roses.
- Types of plant production for field stock – seed, seedlings, budded stock, grafted stock, bare root, root balled, including grading of each type.
- Types of plant production for container stock – cuttings, including softwood, semi-ripe, hardwood; plugs, liners, potting on, specimen plants, buying in stock.

A2 Site selection and growing conditions for nursery stock

- Site considerations for field-grown stock:
  - soil, including structure, texture, pH, depth, fertility, drainage; seasonal characteristics, including drought, frost, waterlogging
  - aspect, topography, exposure, protection
  - access requirements to site for growing and harvesting operations
  - services available for irrigation purposes or obtaining a water-abstraction licence
  - characteristics of site that may impact on choice of plants.
- Container growing area requirements:
  - growing medium, including soil-based and soil-free, peat and peat-free mixes
  - growing medium additions, including sand, horticultural grit, perlite, vermiculite, and nutrients
  - seed and propagation beds, including indoor, outdoor, heated and unheated, lining out beds, growing beds, polytunnels, shade tunnels, hardening-off areas, benching, standing areas, display beds
  - irrigation options, including overhead lines; sprinklers, including individual, line, static and mobile; drip-lines or flood benches with capillary matting, mist benches, hose and lance, soak trays, watering can.

A3 Resource requirements

Establishing the requirements for a nursery, considering the type and size for both field- and container-grown stock.

- Work area requirements:
  - buildings and structures for tasks, including potting on and propagation; storage of plants, tools, machinery, equipment and materials; areas for preparing; safe chemical storage; packing orders for dispatch; waste disposal for both hazardous and non-hazardous waste
  - tools and equipment for field, e.g. forks, lifting and digging spades, secateurs, trowels, dibbers; materials, including string lines, root-ball netting, labels; machinery, including undercutters, tractors, trailers, cultivators
  - tools and equipment for containers e.g. spades, shovels, scoops, dibbers, secateurs, potting machine, trolleys, barrows; materials, including containers, labels.

A4 Factors affecting the management of plant growth and establishment

- Managing plant growth:
  - growing space available, spacing correctly for time of year, stage of development, shape and size of plant, pruning, trimming, providing support.
- Plant monitoring and control of environmental factors:
  - light, water, humidity, temperature, ventilation, protection.
- Managing the health of nursery stock:
  - monitoring and control of pests, including molluscs, mites, insects, weevils, rodents, mammals; diseases, including fungal, bacterial; viruses and disorders, including nutrient deficiencies, climatic effects, mechanical damage, pollutants, hygiene
  - application of feed, including requirements for major, macro and micro nutrients, top dressing, base dressing, granules, powers, liquid, slow release, fertigation.
- Key principles of legislation and regulations governing safe working, to consider:
  - Health and safety at work legislation
  - Personal protective equipment at work regulations
  - Food and environment protection legislation
  - Control of substances hazardous to health (COSHH) regulations
  - Provision and use of work equipment regulations (PUWER)
  - risk assessment requirements.

Learning aim B: Plan for the management and establishment of given field and container nursery stock

B1 Planning for nursery stock production

- Assessment and management of hazards and risks in work area, e.g. uses and storage of tools, equipment and chemicals, personal protective equipment (PPE), safety signage.
- Resources required to produce nursery stock, including cost and availability, e.g. equipment, materials and personnel.
- Factors affecting timeline planning, to include:
  - natural growth times of selected stock
  - work schedules for planting, maintenance and harvest
  - contingency planning for production problems, e.g. adverse weather
  - production timings of plants, seasonal marketing considerations, production costing versus pricing.

Learning aim C: Undertake production and establishment activities for specified nursery stock

C1 Cultivation, establishment and harvest of nursery stock

- Preparation of growth area.
- Selection and use of correct tools, machinery, equipment and materials for specified production task:
  - field-production tools, e.g. lifting and digging spades, secateurs, trowels, dibbers; materials, e.g. string lines, root-ball netting, labels; machinery, e.g. undercutters, tractors, trailers, cultivators
  - container-production tools, e.g. spades, shovels, scoops, dibbers, secateurs; equipment, e.g. potting machine, trolleys, barrows; materials, e.g. containers, labels.
- Planting:
  - production tasks for nursery stock during different stages of development as appropriate, e.g. preparing ground, planting, potting up, potting on
  - provide growing conditions to suit specified nursery stock establishment, including light, water, humidity, temperature, ventilation, protection, spacing to suit stage of development, shape and size of plant
  - work safely, minimising damage to working area; disposing of waste correctly.
- Maintenance and monitoring:
  - prune, tidy, support; provide protection as appropriate to plant, time of year and weather conditions
  - remove weeds, feed and water plants as appropriate.
- Nursery stock health checks:
  - pests, diseases and disorders, good hygiene practices.
- Selection and use of harvest methods appropriate to plant type:
  - ensure nursery stock meets specification, including uniform growth, high quality, clean, tidy, healthy, correct labelling.
- Work safely, minimising damage to working area; disposing of waste correctly.

Assessment criteria

<table>
<tr><th>Pass</th><th>Merit</th><th>Distinction</th></tr>
<tr><td colspan="2">Learning aim A: Explore the requirements for the production and establishment of field- and container-grown nursery stock</td><td rowspan="2">A.D1 Analyse the requirements for a wide range of plant categories for field- and container-grown nursery stock, evaluating the factors that affect their successful growth and establishment.</td></tr>
<tr><td>A.P1 Explain the requirements for the production of field- and container-grown nursery stock.
A.P2 Explain the factors that affect the management of plant growth and establishment in field- and container-grown nursery stock.</td><td>A.M1 Compare the requirements for a range of different plant categories for field-and container-grown nursery stock, assessing the factors that affect their growth and establishment.</td></tr>
<tr><td colspan="2">Learning aim B: Plan for the management and establishment of given field and container nursery stock</td><td rowspan="4">B.D2 Produce a comprehensive plan and accurate timelines for the management and establishment of specified nursery stock, including contingency planning.
C.D3 Carry out production and establishment activities confidently, demonstrating a comprehensive understanding of the methods required for the specified nursery stock.</td></tr>
<tr><td>B.P3 Produce a simple plan with some details for the management and establishment of specified nursery stock.
B.P4 Produce outline timelines for the management and establishment of specified nursery stock.</td><td>B.M2 Produce a detailed plan for the management and establishment of specified nursery stock, which includes accurate timelines and work schedules.</td></tr>
<tr><td colspan="2">Learning aim C: Undertake production and establishment activities for specified nursery stock</td></tr>
<tr><td>C.P5 Carry out basic preparation and planting activities for specified nursery stock.
C.P6 Carry out simple maintenance tasks for specified nursery stock, selecting and using the appropriate tools.</td><td>C.M3 Carry out production and establishment activities effectively, working to the required timelines and using appropriate methods for the specified nursery stock.</td></tr>
</table>

Essential information for assignments

The recommended structure of assessment is shown in the unit summary along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of two summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aim: A (A.P1, A.P2, A.M1, A.D1)

Learning aims: B and C (B.P3, B.P4, C.P5, C.P6, B.M2, C.M3, B.D2, C.D3)

Further information for teachers and assessors

Resource requirements

For this unit, learners must have access to:

- a range of nursery stock plants to work with (these can be field grown or container grown)
- a nursery stock area to prepare and establish plants
- appropriate, well-maintained tools, equipment and materials for carrying out nursery stock tasks
- suitable PPE
- a library with a range of books, brochures and catalogues, and the internet for research.

Essential information for assessment decisions

Learning aim A

For distinction standard, learners will give a comprehensive account of the production requirements for a range of plants, using examples that have quite complex needs. They will make clear links between how production requirements and their timings can affect the successful establishment of nursery stock.

Learners will carry out a thorough review of the factors that affect the management of plant growth across both field- and container-grown nursery stock, coming to some conclusions regarding which factors are the most important. Learners will use technical terms confidently, using the full and accurate botanical names for plants.

For merit standard, learners will give a detailed account of the production requirements for plants from field- and container-grown nursery stock, which have a range of different needs. They will make comparisons between the field- and container-grown stock and assess how the timings of them can affect their successful establishment.

Learners will present their work in a well-organised way and make reference to the botanical plant names.

For pass standard, learners will identify some of the key requirements for producing both field- and container-grown nursery stock, using examples of plants that have quite similar needs. They will show they understand the production requirements and will demonstrate an understanding of the timing of these. Learners will state the main factors that affect establishment of nursery stock plants. Learners will present information accurately, showing they have an understanding of some of the botanical plant names.

Learning aims B and C

For distinction standard, learners will produce a comprehensive plan, which includes detailed and accurate timelines for planting and maintenance, showing a depth of understanding of the tasks and timings required and with contingency planning, including how to ensure the successful establishment and maintenance of the nursery stock.

Learners will consistently carry out the practical tasks to a high standard, selecting the correct tools and equipment, and showing an understanding of any health and safety issues. Learners will show a comprehensive understanding of the plants they are working with and how they meet specifications.

For merit standard, learners will produce a plan that covers in detail the resources required, the natural growth times of the nursery stock, and includes timelines that plan out the work schedule for maintenance and harvest. They will include some details on how to manage risks.

For their practical tasks, learners will demonstrate that they can work safely and organise themselves to carry out the required tasks efficiently. They will select and use tools, equipment and materials suitable for the tasks being completed. Learners will demonstrate a sound knowledge of the plants they are working with, being able to assess their requirements accurately to meet specifications.

For pass standard, learners will plan out the essential tasks required for the management and establishment of the nursery stock but will not go into detail about the finer requirements. They will produce a timeline for key activities, which will consider some of the factors for maintenance and harvest.

Learners will complete basic practical tasks for the production, establishment and maintenance of the nursery stock, showing they can work safely and have an awareness of risks when carrying out their work. They will use tools, equipment and materials to suit the task given.

Links to other units

This unit links to:

- Unit 1: Professional Working Responsibilities
- Unit 4: Work Experience in the Land-based Sectors.

Employer involvement

This unit would benefit from employer involvement in the form of:

- masterclasses
- technical workshops with staff from local land-based organisations
- contribution of ideas to unit assignment/project materials
- support from a local land-based organisation staff as mentors.

Unit 12: Maintenance of Sports and Amenity Turf

Level: **3**

Unit type: **Internal**

Guided learning hours: **60**

Unit in brief

Learners develop the skills needed to manage the maintenance of sports and amenity turf areas. They will develop a maintenance plan and work from this during practical tasks.

Unit introduction

The management of turf is needed in many different areas. Being able to manage turf maintenance is the key to its success. The areas can range from sports facilities such as golf courses that require well-planned daily maintenance, to parks and gardens that have less intensive requirements.

In this unit, you will look at the management and maintenance of both sports and amenity turf. You will research a range of maintenance tasks and look at how often these tasks need to be carried out for various sports and amenity areas. With this knowledge, you will produce a maintenance plan for a given area of turf, and complete some practical maintenance tasks from it on the given area. Practical tasks will then be evaluated against the requirements and standards of the area. Understanding turf requirements, planning maintenance, and evaluating against performance quality standards will mean your turf will be successful in supporting play or recreation for years to come.

This unit will give you the skills to identify, plan for and carry out maintenance tasks for an area of turf. These skills are a huge advantage for progression to employment in roles such as a golf greenkeeper, sports groundsman, a gardener in the grounds of a stately home, or an expert who recommends and sells plants in a garden centre. Alternatively, you may wish to progress to higher education, for example to a horticulture degree.

Learning aims

In this unit you will:

A Investigate the maintenance requirements of sports and amenity turf

B Plan a schedule for a given area of turf to support its maintenance

C Carry out maintenance for a given area of turf to enhance turf quality.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Investigate the maintenance requirements of sports and amenity turf	**A1** Maintenance operations of sports and amenity turf **A2** Factors that affect maintenance operations **A3** Repair and renovation requirements of sports and amenity turf	A report exploring the maintenance requirements of sports and amenity turf and the impact on the quality of turf.
B Plan a schedule for a given area of turf to support its maintenance	**B1** Planning sports and amenity turf maintenance **B2** Seasonal impacts on maintenance planning for sports and amenity turf **B3** Key features of a turf maintenance plan	Evidence includes: • a maintenance plan for a given area of turf • photographic evidence of maintenance tasks carried out • a report on the effect of maintenance on the quality of turf.
C Carry out maintenance for a given area of turf to enhance turf quality	**C1** Preparing to undertake sports and amenity turf maintenance **C2** Completing maintenance tasks **C3** Review of outcomes of maintenance tasks	

Content

Learning aim A: Investigate the maintenance requirements of sports and amenity turf

A1 Maintenance operations of sports and amenity turf

- Areas of sports turf, e.g. football pitches, golf courses, bowling greens, athletics tracks.
- Areas of amenity turf areas, e.g. parks, gardens, recreational areas.
- Maintenance operations and their considerations in terms of type, frequency, maintaining health, meeting requirements of sport or area:
  - mowing
  - scarifying, verticutting, grooming
  - aeration
  - rolling
  - switching/brushing
  - edging.
- Feeding of turf, including summer and winter programmes; applications, including top-dressing, granular, liquid, controlled release.
- Irrigation methods, including summer and winter programmes, automated pop-up systems, oscillating sprinklers, hand watering, boom sprayers, self-propelled/travelling watering systems.
- Range of tools and equipment to plan and manage maintenance, including knowing which tools to use for which situation.
- Pedestrian machinery:
  - mowers, e.g. rotary, cylinder, hover
  - scarifier
  - aerator
  - turf cutter
  - backpack leaf blower
  - knapsack sprayer
  - fertiliser spreader.
- Ride-on machinery:
  - mowers
  - tractors and mounted attachments
  - sprayers
  - gator
  - ATV, quad.
- Hand tools:
  - rakes
  - half moon
  - switch
  - spade
  - shovel
  - fork.
- Powered hand tools:
  - strimmers and brush cutters
  - hand-held leaf blower.
- Essential maintenance requirements of tools, equipment and machinery.

A2 Factors that affect maintenance operations

Health of turf, inspection, impact and positive identification of threats to turf health to include:

- Pests, including:
  - chafer grubs, worm casts, leatherjackets, moles, rabbits, birds, earthworms.
- Diseases, including:
  - fusarium, anthracnose, red thread, dollar spot, rust, fairy rings.
- Disorders, including:
  - dry patch, black layer, chemical damage, thatch, compaction, waterlogging, machinery damage, man-made damage.
- Moss.
- Responding to threats to sports turf, through:
  - physical methods, e.g. by hand and machine
  - chemical methods, e.g. fungicides, pesticides, herbicides, growth regulators, wetting agents
  - biological methods, e.g. the use of bacteria, fungi or nematodes
  - cultural methods, e.g. regular maintenance operations.

A3 Repair and renovation requirements of sports and amenity turf

Selection of the correct repair or renovation method.

- Types of repair and renovation, including:
  - patching
  - plugging
  - divotting
  - over-seeding
  - forking-up
  - re-turfing
  - re-seeding.
- Assessment of area requiring repair or renovation, including extent of damage; most suitable method, including size of area, time of year, area usage, play requirements, resource requirements; costs involved, including time it takes to complete task and time it takes the area to re-establish.
- Factors affecting repair and renovation, including soil type and condition, timings, methods used, weather.

Learning aim B: Plan a schedule for a given area of turf to support its maintenance

B1 Planning sports and amenity turf maintenance

Area of maintenance being planned, and type and frequency of maintenance operations.

- Characteristics of sports and amenity turf areas, including soil, aspect, topography, air movement.
- Aims of maintenance, e.g. to improve grass cover, to improve health of turf, to reduce weeds, to improve drainage, to reduce compaction.
- Objectives to achieve aims, e.g. remove debris from area, dispose of all waste correctly, over-seed area of maintenance operations; resource planning.
- Meeting performance quality standards (PQS) and requirements of governing organisations and professional bodies involved in sports and amenity turf, including:
  - Institute of Groundsmanship (IOG)
  - British and International Golf Greenkeepers Association Limited (BIGGA)
  - Sports Turf Research Institute (STRI)
  - Chartered Institute for the Management of Sport and Physical Activity (CIMSPA).

- Meeting current legislative requirements, including:
  - Health and safety at work legislation
  - Provision and use of work equipment regulations (PUWER)
  - Control of substances hazardous to health (COSHH) regulations
  - Reporting of injuries, diseases and dangerous occurrences regulations (RIDDOR)
  - Manual handling operations regulations
  - Environment legislation
  - waste disposal regulations.

B2 Seasonal impacts on maintenance planning for sports and amenity turf

- The effects of seasons, including operations; climate, aspect and soil.
- Weather and climate, forecast, average weather conditions, precipitation, shade, frost, maximum and minimum temperatures, air movement, extreme weather events.

B3 Key features of a turf maintenance plan

- Key areas that should be included in a maintenance plan:
  - location, characteristics and limitation of the land
  - aims and objectives, e.g. what needs to be achieved and the steps taken towards that aim
  - resource requirements, e.g. tools, equipment, machinery, personnel
  - legal requirements, e.g. risk assessments, staff training requirements such as pesticide applications (PA1, PA2, PA6)
  - costs, e.g. staff, materials and resources
  - maintenance operation timings
  - contingency planning for poor weather, staff sickness, unfavourable ground conditions, machinery unavailable, and dealing with problems and issues.
- Document format to suit area being planned, e.g. wall planners, diaries; spreadsheets, including dates, week numbers; key event planning.

Learning aim C: Carry out maintenance for a given area of turf to enhance turf quality

C1 Preparing to undertake sports and amenity turf maintenance

- Assessment of risk and working safely:
  - identification of hazards and risks of the work area (related to tools, equipment and people) and how these can be minimised, including essential personal protective equipment (PPE)
  - methods for working safely and minimising damage to working areas.
- Correct tools, materials and equipment to maintain turf areas:
  - selection of tools, equipment and machinery relevant to area of maintenance
  - transportation of tools, equipment and machinery to area of maintenance safely.
- Assessment of area before tasks:
  - suitable condition for maintenance task, including assessment of ground and weather conditions
  - removal of debris, organic and inorganic waste before maintenance tasks and correct disposal.

C2 Completing maintenance tasks

Safe completion of maintenance tasks to suit area of turf, time of year and working from the plan.

- Maintenance:
  - safe working practices, e.g. safe use of equipment, appropriate training, lone working, public right of way; compliance with relevant legislation, codes of practice and work specifications, e.g. wearing correct PPE, following risk assessments and minimising risk
  - correct use, maintenance and storage of tools, materials, machinery and equipment
  - safe completion of maintenance tasks
  - minimising environmental damage and maintaining site conditions while carrying out maintenance tasks, e.g. debris removal control, minimising public access, turf conditions
  - area of work left tidy and presentable, using markers, signs or ground under repair (GUR) signs where appropriate; safe disposal of waste, including organic and inorganic.

C3 Review of outcomes of maintenance tasks

Review, to include:

- checking performance quality standards (PQS) are meeting basic recreational use, standard club use and high national or international competition use
- checking the requirements of the turf area are met, e.g. adequate grass cover, low level of weed coverage, turf is in good health
- effectiveness of maintenance tasks, e.g. area improvements seen, growth improvements
- measuring actual outcomes against planned outcomes, e.g. inspection and monitoring areas
- impact of maintenance tasks and the link to enhancing the quality of the turf
- how the review process can inform future strategies – lessons learned, identified improvements, recommendations for improvement
- recording results on the maintenance plan.

Assessment criteria

<table>
<tr><th>Pass</th><th>Merit</th><th>Distinction</th></tr>
<tr><td colspan="2">Learning aim A: Investigate the maintenance requirements of sports and amenity turf</td><td rowspan="2">A.D1 Analyse the maintenance requirements of sports and amenity turf, demonstrating an in-depth understanding of how maintenance enhance their quality, giving detailed examples.</td></tr>
<tr><td>A.P1 Explain the maintenance requirements of sports and amenity turf areas with some examples of the methods used
A.P2 Explain how maintenance enhances the quality of sports and amenity turf.</td><td>A.M1 Assess the maintenance requirements of sports and amenity turf, and how these methods enhance their quality, giving relevant examples.</td></tr>
<tr><td colspan="2">Learning aim B: Plan a schedule for a given area of turf to support its maintenance</td><td rowspan="4">B.D2 Produce a comprehensive maintenance plan for a given area of turf, giving a detailed rationale for approaches taken.

C.D3 Demonstrate a thorough and effective approach to the maintenance of a given area of turf, analysing the impact of own maintenance plan on the quality of turf.</td></tr>
<tr><td>B.P3 Produce a basic maintenance plan for a given area of turf.
B.P4 Explain decisions made when planning maintenance for the given area.</td><td>B.M2 Produce a detailed maintenance plan for a given area of turf, giving a clear rationale for approaches taken.</td></tr>
<tr><td colspan="2">Learning aim C: Carry out maintenance for a given area of turf to enhance turf quality</td></tr>
<tr><td>C.P5 Demonstrate competent maintenance of a given area of turf, using the appropriate methods and safe processes.
C.P6 Explain contribution of own maintenance plan in enhancing quality of turf.</td><td>C.M3 Demonstrate efficient maintenance of a given area of turf, showing a clear consideration of the environment and site conditions.
C.M4 Assess the contribution of own maintenance plan on the quality of a given area of turf.</td></tr>
</table>

Essential information for assignments

The recommended structure of assessment is shown in the unit summary along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of two summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aim: A (A.P1, A.P2, A.M1, A.D1)

Learning aims: B and C (B.P3, B.P4, C.P5, C.P6, B.M2, C.M3, C.M4, B.D2, C.D3)

Further information for teachers and assessors

Resource requirements

For this unit, learners must have access to:

- a range of sports turf and amenity areas to visit (this can be off site)
- an area of sports or amenity turf to plan and carry out maintenance
- appropriate, well-maintained tools, machinery, equipment and materials for carrying out turf maintenance tasks
- suitable PPE
- a library with a range of books, brochures and catalogues, and the internet for research.

Essential information for assessment decisions

Learning aim A

For distinction standard, learners will provide a thorough and detailed account of the maintenance requirements of sports and amenity turf areas. They will demonstrate a depth of understanding of the different requirements of turf areas and the relationship to turf maintenance.

Learners will present a comprehensive account of how effective maintenance enhances the quality of turf, giving robust examples of maintenance activities, how they enhance quality, and a depth of knowledge that shows links between the health of turf and a robust maintenance plan.

Learners will give full, detailed information on the factors that affect maintenance operations, and will recommend ways of overcoming these effectively. Learners will also draw on a depth of knowledge from their learning to accurately identify damage to turf and its causes, and then fully justify the types of repair or renovation tasks that are most appropriate for the area.

Learners will use accurate technical terminology relating to maintenance operations throughout.

For merit standard, learners will fully examine the maintenance requirements of a range of sports and amenity turf areas. They will demonstrate a clear understanding of the different requirements of turf areas and the relationship to turf maintenance.

Learners will present a full account of how effective maintenance enhances the quality of turf, giving relevant examples of how regular maintenance activities can ensure quality is maintained.

Learners will give clear examples of the factors that affect maintenance operations, and the need to take these factors into consideration when planning a maintenance schedule. Learners will show they understand a range of causes of damage to turf and will provide recommendations for repair or renovation tasks that are appropriate to the area. Learners will use mostly correct technical terminology relating to maintenance operations.

For pass standard, learners will produce an account of the maintenance requirements for a small range of sports and amenity turf areas, making broad links between the different turf areas and their maintenance requirements. Learners will explain how effective maintenance enhances the quality of turf and show some consideration of the factors that affect maintenance operations. They will give examples of the damage that may occur in some turf areas and make outline suggestions on the appropriate repair or renovation method. Learners will use some appropriate technical terminology related to maintenance operations but there may be some inconsistencies.

Learning aims B and C

The assessment requires a given area to plan for and carry out maintenance tasks.

For distinction standard, learners will demonstrate clear and detailed reasoning for the approach taken for the maintenance of a given area of turf, through a thorough examination of the area. Learners will consider all relevant aspects that may affect successful maintenance and the quality of the turf. This will include giving full details of the requirements for successful maintenance, and making detailed links to the site conditions.

Learners will produce a comprehensive maintenance plan for a given area of turf, including detailed aims and objectives that accurately meet the needs of the given area, effective weekly tasks with timings, and resource planning. The plan will show robust organisation of tasks, and learners will fully justify their decisions in relation to the suitability of the tasks to be carried out.

Learners will evidence clear ways to minimise risks and fully demonstrate competent safe working practices throughout. They will select correct tools, materials and equipment, using them safely and to industry standard. Learners will carry out maintenance that is effective in supporting the quality of turf. They will draw on knowledge from their learning to reflect on the decisions they made during the practical tasks carried out.

Learners will show a comprehensive understanding of turf requirements that supports the quality of turf before and during maintenance. Effective care of the turf will be provided throughout. Learners will review the methods they used for maintenance and thoroughly explore where they were successful and where methods could be improved or carried out differently.

For merit standard, learners will demonstrate they have assessed the given area to establish the maintenance requirements that match the site conditions, and the links to successful maintenance. They will give reasons for their approach, supported by examples.

Learners will produce a detailed maintenance plan for a given area of turf that identifies aims and objectives, weekly detailed tasks and resource requirements.

Learners will carry out maintenance, showing they have optimised the given area through the preparation of the turf, and by demonstrating efficiency in the time taken, the resources used and the minimal disruption during the maintenance tasks. They will draw on their knowledge to consider ground conditions and prepare the area appropriately. They will assess the hazards and risks involved in carrying out the practical tasks and use the required tools, materials and equipment safely and competently.

Learners will show detailed knowledge of maintenance requirements to enhance the quality of the given area. They will reflect on the methods they used and make clear connections to their impact on the successful maintenance of the given area.

For pass standard, learners will provide details of the features and characteristics of a given area of turf, demonstrating an understanding of the given area, maintenance requirements and any limiting factors.

Learners will produce a simple maintenance plan, outlining the features and characteristics of a given area and taking account of these aspects and giving their reasons for the maintenance tasks included in their plan for the given area.

Learners will work safely, with an awareness of the risks and potential issues arising when carrying out maintenance tasks. Learners will use appropriate methods, tools and equipment to prepare the area and carry out maintenance tasks, leaving the area clean and tidy on completion. On completion of tasks, learners will safely remove and store tools, materials and equipment, disposing of waste materials appropriately.

Learners will provide reasons for their selected methods of maintenance, demonstrating some understanding of the impact these methods have on maintaining the quality of turf.

Links to other units

This unit links to:

- Unit 1: Professional Working Responsibilities
- Unit 4: Work Experience in the Land-based Sectors
- Unit 5: Estate Skills.

Employer involvement

This unit would benefit from employer involvement in the form of:

- masterclasses
- technical workshops involving staff from local land-based organisations
- contribution of ideas to unit assignment/project materials
- observation during work experience
- support from local land-based organisation staff as mentors.

Unit 13: Pests and Disease in Plants

Level: **3**

Unit type: **Internal**

Guided learning hours: **60**

Unit in brief

Learners develop the skills required to identify, prevent and control common pests and diseases in plants.

Unit introduction

What's wrong with that plant?! Pests and diseases can have a significant negative effect on the visual condition of plants and trees, not to mention the economic impacts they can have on production. Knowing what is wrong with a plant, along with the best way to manage the problem, is essential for productive and healthy plants.

In this unit, you will discover the features of a range of pathogens, which can affect plants, including trees, grasses and ornamental plants. You will study how to identify plants and pathogens, along with the signs and symptoms that indicate a plant is under attack from a particular pest or disease. You will explore how to manage plant pathogens using different methods, equipment and techniques in both organic and conventional systems, as well as carrying out your own practical investigations into plant health management.

This unit will support your progression to employment in the land-based sector, or to further study in an apprenticeship or higher educational establishment.

Learning aims

In this unit you will:

A Examine pests and diseases for management of plant health

B Explore strategies for managing plant health

C Undertake monitoring, prevention and control for effective plant health management.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Examine pests and diseases for management of plant health	**A1** Pests and diseases **A2** Signs and symptoms of plant pests and diseases	A report on the identification, spread, reproduction and effect of pests and diseases in plant health management.
B Explore strategies for managing plant health	**B1** Prevention and control strategies **B2** Legislation relating to plant and tree health	Justified strategies for a given scenario for organic and conventional systems for plant health management. Photographic evidence of the practical activities carried out, supported by learners' logs and observation statements from tutors and/or employers.
C Undertake monitoring, prevention and control for effective plant health management	**C1** Monitoring and surveillance methods **C2** Preventing and controlling plant pathogens	

Content

Learning aim A: Examine pests and diseases for management of plant health

The purposes and processes involved in organism identification to determine appropriate health management strategies for pests and diseases affecting particular plants and trees in varying life stages.

A1 Pests and diseases

Common pests and diseases affecting turf, plants and trees.

- Insect pests, to include species of the following:
  - true bugs (*Hemiptera*)
  - wasps (*Hymenoptera*)
  - butterflies and moths (*Lepidoptera*)
  - beetles (*Coleoptera*)
  - crane flies (*Tipula*)
  - chafers (*Phyllopertha*)
  - grass flies, e.g. *Meromyza* spp.
- Gastropod pests, to include *Deroceras*, *Arion*, *Tandonia* spp.
- Animal pests, to include grey squirrels (*Sciurus*), deer (*Cervidae*), and birds.
- Fungal diseases caused by species of *Ascomycota*, to include:
  - apple canker and coral spot (*Nectria*)
  - powdery mildew (*Erysiphales*)
  - fusarium patch (*Microdochium*)
  - black spot (*Diplocarpon*)
  - take-all (*Gaeumannomyces*)
  - Dutch elm disease (*Ophiostoma ulmi*)
  - Sclerotinia disease (*Sclerotinia*)
  - ash dieback disease (*Hymenoscyphus fraxinea*, *Hymenoscyphus pseudoalbidus*).
- Fungal diseases caused by species of *Basidiomycota*, to include:
  - bracket fungus (*Ganoderma*)
  - smuts and bunts (*Tilletia*)
  - rusts (*Puccinia*)
  - honey fungus (*Armillaria*)
  - fairy rings, e.g. *Marasmius oreades*.
- Fungal diseases caused by species of *Oomycota*, to include *Phytophthora* and *Plasmopara* spp.
- Bacterial pathogens, e.g. *Xanthomonas*, *Pseudomonas*.
- Viral pathogens, e.g. cucumber mosaic virus (CMV), plum pox.
- Features of biotic pests and pathogens, as appropriate to insect and animal pests, fungal, bacterial and viral pathogens:
  - life cycles and their significance
  - reproduction methods and rates
  - breeding seasons
  - behavioural characteristics
  - growth and development
  - social structure
  - preferred habitat and food supply
  - natural population controls, e.g. diseases, parasites and natural mortality.

- Mode of movement of pests and pathogens
  - natural spread, e.g. wind, territory
  - vectors, to include arthropods and animals
  - fomites, e.g. vehicles, machinery.

A2 Signs and symptoms of plant pests and diseases

The effects of pests, diseases and abiotic factors on health status, mechanisms of action, and consequences of not addressing issues early, as appropriate.

- Leaf changes:
  - colour
  - structural damage
  - defoliation.
- Trunk, stem and limbs:
  - fissures
  - cracks
  - stripped bark
  - fruitifications
  - shoot distortion.
- Rot types, to include root, seed and wood.
- General signs:
  - dieback
  - premature senescence
  - effects on seed and fruit formation and yield.
- Abiotic and seasonal factors that may impact on pest and disease status:
  - water-related, to include drought, waterlogging, water pollution
  - weather-related, to include frost, shade, sun scorching
  - damage, to include mechanical and herbicidal
  - soil-related, to include poor soil aeration, nutrient deficiencies or excesses.

Learning aim B: Explore strategies for managing plant health

B1 Prevention and control strategies

Purposes, suitability, advantages and disadvantages of methods used to prevent and control pests and diseases of plants in domestic and commercial situations.

- Selection of suitable species and promotion of healthy growth, e.g. irrigation, drainage, nutrition, companion planting.
- Breeding for natural resistance and disease tolerance.
- Culling of pest species, biological control methods.
- Maintenance programmes and application of substances, to include rotation of use as appropriate, e.g. pesticides, fungicides, deterrents.
- Pruning, mowing.
- Sanitation felling.

B2 Legislation relating to plant and tree health

The economic and conservation importance of plant and tree health legislation, and the responsibilities and reporting procedures required for compliance. Legislation and procedures current at the time of teaching must be used.

- Purpose and effects of Plant Health Orders:
  - protection for growers and crop producers from quarantine organisms
  - certification of planting material
  - restrictions on importing, exporting, moving or keeping particular plants, plant pests and other materials such as soil, to include plant passports and scientific licences.

- Requirements for and procedures involved in reporting pests and diseases to the Animal and Plant Health Agency (APHA):
  - beetles, e.g. *Diabrotica* spp
  - bugs, e.g. Wheat Bug (*Nysius huttoni*)
  - caterpillars, e.g. Palm Borer (*Paysandisia archon*)
  - mites, e.g. Fuchsia Gall Mite (*Aculops fuchsiae*)
  - nematodes, e.g. *Meloidogyne fallax*
  - flies, e.g. *Liriomyza* spp
  - bacterial disease, e.g. *Xanthomonas arboricola pv. pruni*, *Xylella fastidiosa*
  - fungal disease, e.g. *Phytophthora ramorum*
  - viral disease, e.g. plum pox virus (Sharka).
- Requirements for certification for organic production, e.g. registration with approved UK organic control bodies, timeframes for certification.
- Requirements when planning for and using pesticides: The Plant Protection Products (Sustainable Use) Regulations 2012.

Learning aim C: Undertake monitoring, prevention and control for effective plant health management

C1 Monitoring and surveillance methods

Purposes, techniques, equipment, procedures, advantages and disadvantages of methods used to monitor pests and disease in plants and trees.

- Recording and assessment methods, e.g. use of field data sheets, software, graphical representation of changes over time.
- Health status markers:
  - general appearance of individual and surrounding plants and trees
  - timing, frequency and type of damage and/or decay.
- Identification of pests and disease, e.g. use of hand lenses, digital cameras, sample preservation.
- Signs of pests, e.g. trapping of invertebrates, presence of faeces and classic signs of damage from larger animals.

C2 Preventing and controlling plant pathogens

Techniques, equipment, processes and timescales involved in the prevention and control of diseases in both organic and conventional production systems for domestic and commercial applications.

- Integrated pest and disease management (IPDM) planning.
- Safe use of treatments, e.g. liquids, sprays, powders.
- Pruning.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Examine pests and diseases for management of plant health		
A.P1 Explain how common pests and diseases can be identified in plants. **A.P2** Explain how common pests and diseases affect the management of plant health.	**A.M1** Assess the characteristics of pests and diseases that affect plants and their impact on the management of plant health.	**A.D1** Evaluate the impact of a wide range of pests and diseases on the management of plant health.
Learning aim B: Explore strategies for managing plant health		
B.P3 Explain the factors to consider for the management of plant health. **B.P4** Select health management strategies for prevention and control of pests and diseases of plants.	**B.M2** Assess the factors to consider for the management of plant health, selecting appropriate strategies for their prevention and control.	**B.D2** Analyse the factors to consider for the management of plant health, justifying the selection of health management strategies for the control of pests and diseases.
Learning aim C: Undertake monitoring, prevention and control for effective plant health management		
C.P5 Carry out basic monitoring activities for the control of pests and diseases in plants. **C.P6** Demonstrate use of basic prevention and control methods, reviewing their effectiveness in the control of pests and diseases in plants.	**C.M3** Demonstrate use of relevant monitoring, prevention and control methods for plants across multiple sites, assessing their effectiveness in the control of pests and diseases in plants.	**C.D3** Demonstrate a confident use of monitoring, prevention and control methods across a range of plants and sites, evaluating their effectiveness in the control of pests and diseases in plants.

Essential information for assignments

The recommended structure of assessment is shown in the unit summary along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of two summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aim: A (A.P1, A.P2, A.M1, A.D1)

Learning aims: B and C (B.P3, B.P4, C.P5, C.P6, B.M2, C.M3, B.D2, C.D3)

Further information for teachers and assessors

Resource requirements

For this unit, learners must have access to:

- a range of plants and trees in different habitats
- images and samples of common pests
- images and samples of plants affected by common pests and diseases
- a range of equipment and methods used to monitor, prevent and control pests and diseases.

Essential information for assessment decisions

Learning aim A

For distinction standard, learners will give a wide-ranging account of common and uncommon pests and diseases that are relevant to the health management of plants. They will provide a comprehensive overview that links features such as life cycle, reproduction, preferred habitats and modes of movement with particular geographical locations and species of plants/trees. Learners will demonstrate a thorough understanding of the similarities and differences among different pests and diseases, the reasons for signs and symptoms of pathogens in plants, and the importance of correctly identifying both host and pest/disease for effective health management.

For merit standard, learners will provide detailed accounts of the features of common pests and diseases, such as the different parts of their life cycles and modes of movement and spread. Learners will give careful consideration to the varied factors affecting the susceptibility of plants to pests and diseases, coming to a reasoned conclusion of how and why they affect their hosts.

For pass standard, learners will cover pests and diseases that affect plants, which are common problems in their sector. They will demonstrate a basic understanding of fungi, bacteria, viruses, insects, gastropods, mammals and large animals that may affect particular plants. Learners will outline the characteristics of the organisms, their effects on plants and how these can be used in combination for identification purposes.

Learning aims B and C

For distinction standard, learners will demonstrate a holistic understanding of effective plant health management. They will give a comprehensive account of organic and conventional pest and disease management in both domestic and commercial contexts. Learners will comment on the future impact of current prevention and control strategies, including the relevance of UK plant health legislation. Learners will justify decisions made for managing plant health and make recommendations based on the effectiveness of methods used to monitor, prevent and control pests and disease. They will work with little need for intervention. Written work will be logically structured, coherently written and illustrated appropriately throughout, while standards of practical work will be to at least merit level.

For merit standard, learners will demonstrate a good understanding of different methods of monitoring, preventing and controlling pests and disease, identifying the most suitable methods to use after careful consideration of the factors affecting a given situation, such as the need to prevent disease in a certified organic system. This will include an awareness of the purpose and responsibilities under UK regulation and legislation. Learners will carry out techniques in a manner that demonstrates familiarity with the correct methods to achieve the desired outcomes. Their depth of understanding and skill will be evident in their ability to effectively manage more complex situations such as the monitoring of multiple sites, using inherently more complex equipment, or completion of a longer-term project requiring accuracy and dedication.

For pass standard, learners will consider a minimum of three plant species as appropriate to the sector. They will outline the pests and diseases that may present particular problems in each case, their impacts on the health of the plant or tree, and the likely consequences if control measures are not put in place.

Learners will demonstrate understanding of the basic methods of monitoring levels of pests and diseases, along with their responsibilities under UK legislation. They will use equipment and resources correctly and safely to perform one organic and one conventional method for preventing and controlling pests and disease. Throughout the practical work, learners will monitor and record the pest and disease status in each case, giving basic and correct details of the features and processes used to identify organisms.

Links to other units

This unit links to:

- Unit 4: Work Experience in the Land-based Sectors
- Unit 6: Identification, Planting and Care of Plants
- Unit 8: Plant Propagation Activities.

Employer involvement

This unit would benefit from employer involvement in the form of:

- masterclasses
- technical workshops involving staff from local land-based organisations
- contribution of ideas to unit assignment/project materials
- observation during work experience
- support from local land-based organisation staff as mentors.

Unit 14: Identification, Planting and Care of Trees

Level: **3**

Unit type: **Internal**

Guided learning hours: **60**

Unit in brief

Learners develop the skills needed to plant trees and provide their aftercare, and the knowledge to identify trees using botanical nomenclature.

Unit introduction

Trees are one of the most amazing and diverse range of plants on the Earth, thriving in both urban and rural locations. Tree planting occurs for many reasons, including the management of native woodland, the shaping of the landscape, the production of edible fruit, or simply as ornamental, stand-alone specimens. Being able to correctly identify trees is essential for anyone working in the land-based sector, especially when selecting appropriate trees for planting.

In this unit, you will learn the correct botanical nomenclature and terminology used when identifying trees, as well as the individual characteristics that aid their identification. You will research a range of different trees suitable for a given area and select appropriate trees for planting, using your knowledge of their individual requirements. You will complete practical tasks in planting your chosen trees and providing aftercare so that they establish successfully. Understanding tree requirements and providing suitable surroundings and continued aftercare will mean that your trees will flourish and form a significant feature of the landscape for many years to come.

This unit will give you the skills to identify, plant and care for trees. These skills are a huge advantage for progression to employment in roles such as a greenkeeper, gardener in the grounds of a stately home, or an expert who recommends and sells plants in a garden centre. Alternatively, you may wish to continue your study to higher education, for example countryside management degrees.

Learning aims

In this unit you will:

A Understand botanical nomenclature and terminology for the purpose of tree identification

B Explore factors affecting selection of trees and their suitability for use in a given area

C Undertake planting and aftercare of trees in a given area.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Understand botanical nomenclature and terminology for the purpose of tree identification	**A1** Terminology used in tree nomenclature **A2** Categorisation of trees **A3** Characteristics of trees for identification	A written report on the biological nomenclature and tree characteristics that are used to identify trees, including their effectiveness.
B Explore factors affecting selection of trees and their suitability for use in a given area	**B1** Considerations affecting the choice of trees for specific areas **B2** Factors affecting the suitability of trees	Research notes on the factors that affect the selection and suitability of trees for planting, using findings to select trees to plant in a given area. A portfolio of evidence showing how trees are selected, planting activities and aftercare to ensure trees establish successfully.
C Undertake planting and aftercare of trees in a given area	**C1** Preparation for planting **C2** Planting methods **C3** Providing aftercare	

Content

Learning aim A: Understand botanical nomenclature and terminology for the purpose of tree identification

Naming conventions and taxonomic categories used to identify trees based on their features, and the importance of using the correct terminology.

A1 Terminology used in tree nomenclature

- Plant classification order for trees:
  - kingdom
  - phyla, including gymnosperms and angiosperms
  - class, including monocotyledons and dicotyledons
  - family
  - genus
  - species
  - sub-species, variety, form, cultivar, hybrid.
- Importance of botanical names:
  - problems that occur using common plant names, including using the native tongue, regional differences, multiple common names for the same genus
  - binominal system for plant naming.
- Correct format for writing plant names:
  - correct use of capital letters, lower case letters, single quotation marks
  - correct use of symbols and abbreviations
  - correct use of descriptive names to aid identification, e.g. pendula, alba, macrophyllum.

A2 Categorisation of trees

Definition, categorisation and identification of trees from native and non-native species:

- broad-leaved trees
- ornamental trees
- evergreen trees
- conifers.

A3 Characteristics of trees for identification

Methods used to identify trees using tree features and characteristics.

- Morphological features and characteristics used in the identification of trees:
  - foliage, including bark, branch, twig, lenticels, node, internode
  - leaf arrangements, including alternate, opposite and whorled, leaf bud, petiolated and sessile
  - veination, including reticulated and parallel, simple and compound
  - leaf types, including cordate, ovate, lanceolate, linear, oblong, palmate, pinnate, trifoliate, lobed, needles, scales
  - leaf colour
  - flowers, including bud, petals, bract, singular, grouped, shape, colour, arrangement
  - succulent fruits, including berries, fruits, drupes
  - dried fruits, including nuts and seeds
  - seasonal features, including stems, foliage, flowers, seeds, fruits.

- Identification methods and tools:
  - tactile features, including smooth, soft, spiked, rough, spongy
  - smell, including fragrant flowers, foliage, sap
  - visual observations, including growth habit, height, spread
  - form, including oval, columnar, rounded, pyramidal, weeping, irregular, vase
  - illustrated textbooks, nursery catalogues, brochures and labels
  - technology, including smartphone apps
  - identification keys, including flow chart, dichotomous key.
- Sources of information and standards for classification, e.g. Forestry Commission, Royal Horticultural Society, the Woodland Trust.

Learning aim B: Explore factors affecting selection of trees and their suitability for use in a given area

Considerations affecting the selection of trees for planting in specific areas.

B1 Considerations affecting the choice of trees for specific areas

Plant requirements:

- preferred soil type, including clay, sand, silt, loam, pH
- nutrient requirements, including primary/macronutrients, secondary nutrients and trace elements for growth, rigour, establishment, flowering and fruiting
- aspect, including light and shade tolerance, space available, frost and sun pockets, protection, topography, air quality
- support needs, including stakes, canes, guards, guys, anchors, ties
- planting stock type, including bare root, root balled, containerised
- specific requirements, including protection and support type for individual trees, including Quercus, Fraxinus, Betula, Malus, Prunus, Salix, Juglans and Fagus; and for sizes of plant, including seedlings, whip, feathered whip, bush, standard, half-standard, budded/grafted, including maiden, feathered maiden.

B2 Factors affecting the suitability of trees

- Tree growth and habit:
  - size of tree at planting, growth speed, root spread, size, shape and appropriateness of tree for given purpose, including pyramidal, conical, columnar, spreading, rounded, vase shaped, broad.
- Surroundings that affect tree selection:
  - environmental factors, including buildings and structures, overhead and underground services, traffic, highways, climate and microclimate, exposure, drainage, uneven ground, preferred habitat, space
  - public access areas, footpaths, rights of way, potential issues of falling leaves, fruit, overhanging branches, maintenance access
  - aesthetic value, grouping and combinations, arboricultural merit, silvicultural merit
  - soil structure, texture, pH, drainage, nutrient value, depth, including impact on anchorage and support systems.

Learning aim C: Undertake planting and aftercare of trees in a given area

Consideration when preparing to plant, planting and providing aftercare of trees.

C1 Preparation for planting

- Assessing risk and working safely:
  - identification of hazards and risks around the work area (related to tools, equipment, people) and how these can be minimised, including essential personal protective equipment (PPE)
  - legislation, including Environmental Protection Act 1990, Wildlife and Countryside Act 1981, Health and Safety at Work etc. Act 1974, Control of Substances Hazardous to Health (COSHH) Regulations 2002
  - methods for working safely and minimising damage to working areas.
- Use and application of correct tools, materials and equipment to prepare ground for planting:
  - tools, including spade, rake, hoe, trowel, wheelbarrow
  - materials, including stakes, ties, guards, soil conditioners, organic matter, fertiliser base dressing
  - machinery, including cultivator, rotavator, excavator.
- Ground preparation:
  - cultivation by hand or machine, including correct depth, consolidation, level, addition of soil conditioners, ameliorants, fertilisers, anti-desiccants, as appropriate to area
  - removal of debris, weeds, organic and inorganic waste before planting and correct disposal.

C2 Planting methods

Activities undertaken to ensure optimum condition for planting and successful establishment.

- Use and application of correct tools and equipment for planting:
  - tools, including spades, e.g. Schlick, Mansfield, rake, hoe, trowel, secateurs, loppers, wheelbarrow
  - machinery, including hydraulic tree spades, rotary planters, augers.
- Tree preparation, including watering, removal of dead foliage and weeds, pruning.
- Planting:
  - safe working practices to minimise damage to working area and self
  - reviewing ground preparation
  - handling of trees to avoid damage
  - backfilling
  - safe disposal of waste, including organic and inorganic
  - safe removal of tools and equipment.

C3 Providing aftercare

Methods, equipment and materials used for successful establishment and growth.

- Tree protection, including support, e.g. stakes, guys, anchors and guards for protection from animals, people and weather.
- Initial aftercare to ensure successful establishment, including feeding, watering, pruning, mulching with organic and inorganic materials, disposal of waste, including organic and inorganic.
- Continued aftercare, including inspection, nutrition, watering, formative pruning, moisture retention, mulching, adjustment and removal of support, use of pesticides and herbicides.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Understand botanical nomenclature and terminology for the purpose of tree identification		
A.P1 Explain the botanical nomenclature and terminology used to identify trees. **A.P2** Explain plant classification and different characteristics that aid identification.	**A.M1** Assess how botanical nomenclature and characteristics aid tree identification.	**A.D1** Evaluate the effectiveness of botanical nomenclature and characteristics in aiding tree identification.
Learning aim B: Explore factors affecting selection of trees and their suitability for use in a given area		
B.P3 Explain the factors that affect the selection of trees in a given area. **B.P4** Explain own selection of trees for a given area.	**B.M2** Analyse factors for own selection of trees for a given area.	**B.D2** Evaluate own selection of trees based on factors that affect selection and suitability for a given area. **C.D3** Evaluate methods used to carry out planting and aftercare, with recommendations for future improvements.
Learning aim C: Undertake planting and aftercare of trees in a given area		
C.P5 Demonstrate safe working practices when carrying out ground preparation, planting and aftercare to establish new trees. **C.P6** Explain methods used to carry out planting and aftercare of trees.	**C.M3** Demonstrate efficient working practices when preparing, planting and providing aftercare to establish new trees. **C.M4** Analyse the impact of own methods used to carry out planting and aftercare.	

Essential information for assignments

The recommended structure of assessment is shown in the unit summary along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of two summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aim: A (A.P1, A.P2, A.M1, A.D1)

Learning aims: B and C (B.P3, B.P4, C.P5, C.P6, B.M2, C.M3, C.M4, B.D2, C.D3)

Further information for teachers and assessors

Resource requirements

For this unit, learners must have access to:

- a range of trees to study, from young whips to mature trees
- an area to plant and establish new trees
- appropriate, well-maintained tools, equipment and materials for preparing ground, planting and providing aftercare to trees
- suitable PPE.

Essential information for assessment decisions

Learning aim A

For distinction standard, learners will provide a thorough and detailed account of the effectiveness of biological nomenclature and physical plant characteristics when identifying trees. They will show depth of understanding by making detailed links between their use and tree identification, using well-selected, accurate examples of how this leads to positive identification. Learners will provide detailed reasoning as to the limitations of using descriptive biological nomenclature and characteristics to identify trees, using well-selected examples of negative identification.

Learners will consider identification methods and tools thoroughly, recommending those that lead to positive identification.

For merit standard, learners will examine the effectiveness of biological nomenclature and characteristics when identifying trees. They will demonstrate their understanding by making clear links between their use and tree identification, using appropriate examples of how this leads to positive identification. Learners will demonstrate awareness of the limitations of these methods to identify trees and support this through the use of examples and an explanation of some of the issues.

Learners will provide a clear understanding of identification methods and tools, and provide clear reasoning as to the link between the methods and positive identification.

For pass standard, learners will demonstrate clear understanding of the approach used in botanical nomenclature and the methods used to obtain a positive identification of trees using physical characteristics. Learners will demonstrate some awareness that there are limitations to their use.

Learners will provide details of a number of identification methods and tools, and the main reasons they may be selected for use.

Learning aims B and C

The assessment requires a given area to carry out the selection, preparation, planting and aftercare of trees.

For distinction standard, learners will demonstrate clear and detailed reasoning for their tree selection through a thorough examination of the given planting area, considering all relevant aspects that may affect successful tree establishment. This will include full details on the tree requirements for successful growth, meticulously linked to the site conditions. Learners will consider their choices carefully and fully justify their selection in relation to factors affecting suitability.

Learners will carry out planting and aftercare that is effective in supporting the successful establishment of their chosen trees. Learners will evidence clear ways to minimise risks and fully demonstrate competent safe working practices throughout. They will select correct tools, materials and equipment, using them safely and to industry standard. They will draw on knowledge from their learning to reflect on the decisions they made when planting and undertaking practical tasks. Efficient care to the tree will be provided throughout the planting and aftercare processes.

Learners will show a comprehensive understanding of tree requirements before planting, during planting and when providing aftercare to support the successful establishment of trees. Learners will review the methods they used for planting and aftercare to thoroughly explore where they were successful and where methods could be improved or carried out differently.

For merit standard, learners will provide evidence that they have researched different trees and tree types to select trees for planting that clearly match the site conditions and the likelihood of successful establishment. Learners will review their selection of trees, presenting well-documented evidence and making reasoned recommendations for their selection, providing clear links between the features of the given planting site and the selected trees.

Learners will carry out planting, showing they have optimised the given area through the preparation of the site and trees, planting with skill, and by demonstrating efficiency in the time taken, the resources used and the minimal disruption to the trees during the planting process. Learners will draw on their knowledge to consider ground conditions and prepare the area appropriately. They will assess the hazards and risks involved in carrying out the practical tasks and use the required tools, materials and equipment safely and competently.

Learners will show detailed knowledge of individual tree requirements in order to provide aftercare that helps to support successful establishment, for example providing tree stakes, ties and protection that match the age of the tree planted.

Learners will reflect on the methods they used and make clear connections to their impact on the successful establishment of trees.

For pass standard, learners will provide details of the features and characteristics of a given area and research a range of suitable trees for the area, demonstrating an understanding of different tree types, requirements and any limiting factors of the area to be planted. Learners will select a range of trees from those researched, making links between site characteristics and tree requirements.

Learners will work safely, with an awareness of the risks and potential issues arising when preparing the ground for planting trees, during the planting process, and when providing aftercare. Learners will use appropriate methods, tools and equipment to prepare and plant their selected trees, leaving the area clean and tidy on completion. Learners will provide basic aftercare for trees, which may include tree guards or support. On completion of the tasks, learners will safely remove and store tools, materials and equipment, disposing of waste materials appropriately.

Learners will provide reasons for their selected methods for tree planting and aftercare, demonstrating some understanding of the impact these methods have on the successful establishment of trees.

Links to other units

This unit links to *Unit 4: Work Experience in the Land-based Sectors*.

Employer involvement

This unit would benefit from employer involvement in the form of:

- masterclasses
- technical workshops involving staff from local land-based organisations
- contribution of ideas to unit assignment/project materials
- observation during work experience
- support from local land-based organisation staff as mentors.

Unit 15: Developing a Land-based Enterprise

Level: **3**

Unit type: **Internal**

Guided learning hours: **60**

Unit in brief

Learners develop the skills needed to prepare a business plan for a viable land-based enterprise, based on their own market research and financial feasibility study.

Unit introduction

Understanding the operation of any business is vital if it is to be successful. Employees need to have knowledge of the business environment and marketplace as well as good business management skills. The land-based sector is predominately made up of small and medium-sized businesses, and this provides many opportunities to set up your own business.

In this unit, you will learn about the features and resources, including human, physical and financial, and the processes that businesses operating in the land-based sector need. You will undertake a financial viability study, preparing cash flows, an income statement and a statement of financial position. You will undertake market research to identify a viable enterprise, leading to the production and presentation of a viable business start-up plan for a chosen land-based enterprise.

These activities will prepare you for employment in the land-based sector in roles such as unit manager, or for self-employment in the sector. This unit will also enable you to progress to higher education courses such as a degree in land-based business management or relevant vocational degrees such as horticulture or countryside management.

Learning aims

In this unit you will:

A Examine the features, resource requirements and processes of businesses operating in the land-based sector

B Carry out market research to identify a financially viable land-based enterprise

C Develop a business start-up plan for a viable land-based enterprise.

Summary of unit

Learning aim	Key content areas	Recommended assessment approach
A Examine the features, resource requirements and processes of businesses operating in the land-based sector	**A1** Features of land-based businesses **A2** Resource requirements of land-based businesses **A3** Land-based business processes and procedures	A report that investigates the key features, resource requirements and processes of a profit and a not-for-profit business operating in the land-based sector.
B Carry out market research to identify a financially viable land-based enterprise	**B1** Market research and analysis **B2** Financial feasibility of a land-based enterprise	A business start-up plan for a chosen enterprise for presentation to potential stakeholders, supported by market research and a financial viability analysis.
C Develop a business start-up plan for a viable land-based enterprise	**C1** Features of a business start-up plan **C2** Presenting and evaluating the business plan	

Content

Learning aim A: Examine the features, resource requirements and processes of businesses operating in the land-based sector

A1 Features of land-based businesses

- Ownership and liability, to include sole trader, partnership, private and public limited company, franchises, public sector businesses, not-for-profit.
- Objectives associated with business type, e.g. supply of products or services, not-for-profit, profit making.
- Scope of business activities, to include local, national, international.
- Link between land-based and associated industries in the supply chain, e.g. production and manufacturing, leisure.
- Reasons for success and how they differ depending on ability to meet demand, use of technology, type of business, innovative products or systems.
- Importance of land-based industries to regional and local economies, including social and environmental impact, e.g. bringing employment, gross domestic product (GDP), changes in biodiversity, sustainability.

A2 Resource requirements of land-based businesses

- Physical resources, to include land, machinery, equipment, materials.
- Human resources, including skills and knowledge requirements, staff, structure.
- Financial resources, including internal (retained profit) and external sources (loans, hire purchase, grants).
- Educational resources, such as professional trade associations and trade bodies, government organisations, e.g. Department for Environment, Food and Rural Affairs (Defra), research organisations.

A3 Land-based business processes and procedures

Importance, legal aspects and management efficiency.

- Sourcing materials and services, e.g. timing, purchasing, ordering procedures, credit control, record keeping.
- Planning the production of products or services, e.g. forecasting supply and demand, methods of production (job, batch, lean, flow).
- Sales and marketing, e.g. pricing strategies, costs, internal and external communication, promotional activities (direct marketing, advertising).
- Legislative recording requirements, e.g. health and safety, Control of Substances Hazardous to Health (COSHH) Regulations 2002, food safety, plant and animal passports.
- Details and purpose of relevant registration schemes, e.g. Red Tractor Assurance, quality management schemes, land registry, Registration of Land-based Operatives (ROLO), Forest Stewardship Council (FSC).
- Monitoring business operations to improve performance, e.g. gross margin, production levels, financial efficiency, against targets, advantages, disadvantages.

Learning aim B: Carry out market research to identify a financially viable land-based enterprise

B1 Market research and analysis

Understanding the marketplace, customers and competitors.

- Target market, e.g. types of customer, age, location.
- Primary and secondary research, e.g. questionnaires, surveys, interviews.
- Analysis of the business environment, including Porter's five forces, PESTLE (political, economic, social, technological, legal, environmental) and SWOT (strengths, weaknesses, opportunities, threats).
- Competitor analysis, to include indirect and direct competitors, local, national, international, market share, reputation, pricing, customers.
- Barriers to setting up, e.g. viability, cash flow, finance, legislation, resources.

B2 Financial feasibility of a land-based enterprise

Financial feasibility study – assessment of financial aspects of starting up an enterprise.

- Amount of finance needed, including set-up costs, fixed and variable costs.
- Sources of capital, e.g. investors, own, grants, loans.
- Calculation of break-even forecast and margin of safety.
- Calculation of return on capital employed, net profit margins, current ratio.
- Preparation of financial accounts, to include:
  - income statement
  - statements of financial position
  - cash flow forecasts.

Learning aim C: Develop a business start-up plan for a viable land-based enterprise

C1 Features of a business start-up plan

Key areas that need to be included in a business plan.

- Nature of the enterprise, e.g. sales, service.
- Business aims and objectives, e.g. profit, survival, growth, long and short term.
- Legal structure and operation.
- Resource requirements.
- Promotion, including methods and costs.
- Financial forecasts, including opening and closing statement of financial position, capital to show investment needed, cash flow forecast.
- Summary of market analysis and competition.
- Measures of success, e.g. financial and non-financial key performance indicators.
- Risks and contingency plans.

C2 Presenting and evaluating the business plan

- Documentation, to include financial forecasts, summary of business, business plan.
- Presentation of the business plan to potential investors, e.g. stakeholders, bank, formal, informal, face to face, via submission of documentation.
- Evaluating the business plan, e.g. appropriate method of presentation, clearly set out, feedback from the potential investor, sufficient preparation, level of detail included, coverage of key areas, enable potential investor or stakeholder to make decisions based on the information.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Examine the features, resource requirements and processes of businesses operating in the land-based sector		**A.D1** Evaluate the impact of key business features, resource requirements and processes on the performance of two contrasting businesses in the land-based sector.
A.P1 Explain the features and resource requirements of two contrasting businesses in the land-based sector. **A.P2** Explain the business processes and procedures for two contrasting businesses in the land-based sector.	**A.M1** Analyse the impact of business features, resource requirements, features and processes on the operation of two contrasting businesses in the land-based sector.	
Learning aim B: Carry out market research to identify a financially viable land-based enterprise		**B.D2** Evaluate own market research and financial feasibility study, drawing out valid conclusions to produce a comprehensive business start-up plan for a chosen land-based enterprise.
B.P3 Carry out market research to identify a land-based business enterprise. **B.P4** Carry out a financial feasibility study for a land-based enterprise.	**B.M2** Analyse the results of own market research and financial feasibility study to develop a business start-up plan for a chosen land-based enterprise.	
Learning aim C: Develop a business start-up plan for a viable land-based enterprise		**C.D3** Evaluate own business start-up plan, justifying conclusions.
C.P5 Produce a basic business start-up plan for a chosen land-based enterprise, based on own research. **C.P6** Explain the business start-up plan to relevant stakeholders.	**C.M3** Produce a detailed business start-up plan for a chosen land-based enterprise, based on own research to present to relevant stakeholders.	

Essential information for assignments

The recommended structure of assessment is shown in the unit summary along with suitable forms of evidence. *Section 6* gives information on setting assignments and there is further information on our website.

There is a maximum number of two summative assignments for this unit. The relationship of the learning aims and criteria is:

Learning aim: A (A.P1, A.P2, A.M1, A.D1)

Learning aims: B and C (B.P3, B.P4, C.P5, C.P6, B.M2, C.M3, B.D2, C.D3)

Further information for teachers and assessors

Resource requirements

For this unit, learners must have access to:

- two business types, non-profit and profit, which will allow learners to gain information (one could be learners' work placement)
- business planning tools or information/support such as that provided by banks etc.

Essential information for assessment decisions

Learning aim A

The two business examples used must be in the land-based sector but could be from different industries in the sector, i.e. a charity in the animal sector and Dairy Crest in the agricultural sector.

For distinction standard, learners will show depth of understanding by evaluating how resource requirements, key business features, processes and procedures impact on the performance of two businesses operating in the land-based sector, with one being a for-profit business and the other a not-for-profit business. Learners will support their evaluation with well-chosen examples from their two businesses. They will review how decisions made in the supply chain impact on business performance and show, through their evaluation, the advantages and disadvantages of the processes and procedures used in the businesses, and how these processes impact on and improve business performance. Learners will justify their conclusions by linking the impact to key features, processes and procedures, and resource requirements, rather than just explaining these in general terms.

For merit standard, learners will demonstrate their understanding of how resource requirements, key business features, processes and procedures affect the effectiveness of two businesses operating in the land-based sector, selecting some examples to support their understanding. They will review the links between different land-based businesses in the supply chain and their relationship to each other. Learners will make reasoned, analytical judgements in relation to a number of advantages and disadvantages of the different processes and procedures used in the businesses, and how these processes can improve business performance, for example the advantage of sourcing raw materials locally reduces transport costs and time to market, improving business costs and readiness of products.

For pass standard, learners will recall knowledge to explain the key business features, resource requirements, processes and procedures required to operate a for-profit and a not-for-profit business in the land-based sector. Learners will explain the importance of links between different land-based businesses in the supply chain and how these relate to each other. They will use relevant research to show the resource requirements and the importance of these in operating a business effectively, using specific examples. Learners will demonstrate an understanding of the processes and procedures used in the businesses, and how these relate to business performance, for example registration with a quality assurance scheme gives customers confidence in the product and the company they are buying from, resulting in return purchasing.

Learning aims B and C

Learners should prepare their own business plan. Presentation of the business plan can take the form of a formal presentation, an informal meeting or discussion or submission of the written documentation, as appropriate.

For distinction standard, learners will use concise and professional arguments when reviewing their own research and financial feasibility study, giving reasons for all elements. They will demonstrate clearly how their market research and financial feasibility study will underpin the development of a comprehensive business start-up plan and support this with carefully chosen examples, such as their financial forecasts to show the predicted success of the chosen business. Based on their evaluation, they will give clear and detailed reasons for their conclusions.

Learners will present their business start-up plan individually, demonstrating a high standard of technical ability, attention to detail, and use of the correct business terminology and communication style. They will evaluate this plan, taking into account feedback, their preparation, method of presentation and level of detail. They need to demonstrate their understanding by justifying any conclusions made within their evaluation and recommendations.

For merit standard, learners will make reasoned, analytical judgements about their financial feasibility study and market research and how they relate to the development of the business start-up plan, supporting this with examples. They will produce their business start-up plan based on their own research that includes the type of business, its aims and objectives, resource requirements, methods of promotion, risks and contingency plans and financial forecasts. Learners will individually present this plan in a professional way, demonstrating attention to detail, use of appropriate business terminology and preparation before the final presentation. There will be some analysis of the feedback from the potential investors or stakeholders.

For pass standard, learners will undertake some market research using primary and secondary research, supported by an analysis of the market and potential competitors in identifying a suitable business. They will also identify the potential sources of finance and costs, and prepare a cash flow forecast and income statement that relate to their business start-up, supporting these with examples. Learners will individually prepare a basic business start-up plan from their research, including the outline of the business, its aims and objectives, methods of promotion, a cash flow forecast, and profit and loss statement. They will present this plan, showing some knowledge and understanding of business terminology and answering questions from the potential investors or stakeholders.

Links to other units

This unit links to *Unit 4: Work Experience in the Land-based Sectors.*

Employer involvement

This unit would benefit from employer involvement in the form of:

- masterclasses from industry
- technical workshops involving staff from local land-based organisations
- contribution of ideas to unit assignment/project materials
- observation during work experience
- support from local land-based organisation staff as mentors.

4 Planning your programme

How do I choose the right BTEC National qualification for my learners?

BTEC Nationals come in a range of sizes, each with a specific purpose. You will need to assess learners very carefully to ensure that they start on the right size of qualification to fit into their 16–19 study programme, and that they take the right pathways or optional units that allow them to progress to the next stage.

Some learners may want to take a number of complementary qualifications or keep their progression options open. These learners may be suited to taking a BTEC National Certificate or Extended Certificate. Learners who then decide to continue with a fuller vocational programme can transfer to a BTEC National Diploma or Extended Diploma, for example for their second year.

Some learners are sure of the sector they want to work in and are aiming for progression into that sector via higher education. These learners should be directed to the two-year BTEC National Extended Diploma as the most suitable qualification.

As a centre, you may want to teach learners who are taking different qualifications together. You may also wish to transfer learners between programmes to meet changes in their progression needs. You should check the qualification structures and unit combinations carefully as there is no exact match among the different sizes. You may find that learners need to complete more than the minimum number of units when transferring.

When learners are recruited, you need to give them accurate information on the title and focus of the qualification for which they are studying.

Is there a learner entry requirement?

As a centre it is your responsibility to ensure that learners who are recruited have a reasonable expectation of success on the programme. There are no formal entry requirements but we expect learners to have qualifications at or equivalent to Level 2.

Learners are most likely to succeed if they have:

- five GCSEs at good grades and/or
- BTEC qualification(s) at Level 2
- achievement in English and mathematics through GCSE or Functional Skills.

Learners may demonstrate ability to succeed in various ways. For example, learners may have relevant work experience or specific aptitude shown through diagnostic tests or non-educational experience.

What is involved in becoming an approved centre?

All centres must be approved before they can offer these qualifications – so that they are ready to assess learners and so that we can provide the support that is needed. Further information is given in *Section 8*.

What level of sector knowledge is needed to teach these qualifications?

We do not set any requirements for teachers but expect that centres will assess the overall skills and knowledge of the teaching team to ensure that they are relevant and up to date. This will give learners a rich programme to prepare them for employment in the sector. As part of the requirements of the programme is to involve employers in delivery, this should support centres in ensuring that they are following up-to-date practices when delivering the programme.

What resources are required to deliver these qualifications?

As part of your centre approval you will need to show that the necessary material resources and work spaces are available to deliver BTEC Nationals. For some units, specific resources are required. This is indicated in the units.

How can myBTEC help with planning for these qualifications?

myBTEC is an online toolkit that supports the delivery, assessment and quality assurance of BTECs in centres. It supports teachers with activities, such as choosing a valid combination of units, creating assignment briefs and creating assessment plans. For further information see *Section 10*.

Which modes of delivery can be used for these qualifications?

You are free to deliver BTEC Nationals using any form of delivery that meets the needs of your learners. We recommend making use of a wide variety of modes, including direct instruction in classrooms or work environments, investigative and practical work, group and peer work, private study and e-learning.

What are the requirements for meaningful employer involvement?

Requirements

This BTEC National Foundation Diploma in Horticulture has been designed as a Tech Level qualification. As an approved centre you are required to ensure that, during their study, every learner has access to meaningful activity involving employers. Involvement should be with employers from the horticulture sector and should form a significant part of the delivery or assessment of the qualification. Each centre's approach to employer involvement will be monitored in two ways. It will be monitored at centre level in the first term each year as part of the annual quality management review process that addresses centre strategy for delivery, assessment and quality assurance, when we will ask you to show evidence of how employer involvement is provided for all learners. You will need to show evidence in order to gain reporting clearance for certification. It will be monitored also at programme level as part of the standards verification process to confirm that plans for employer involvement meet the requirements of the specification. These approaches are designed to ensure additional activities can be scheduled where necessary so learners are not disadvantaged (see *Section 8 Quality assurance*).

We know that the vast majority of programmes already have established links with employers. In order to give you maximum flexibility in creating and strengthening employer involvement, we have not specified a particular level of input from employers. However, meaningful employer involvement, as defined below, should contribute significantly to at least **one** mandatory unit.

The mandatory unit *Unit 4: Work Experience in the Land-based Sectors*, specifies where delivery and/or assessment will be linked to employers:

For this qualification, learners are expected to undertake 150 hours of work experience.

Also, there are suggestions in many of the units about how employers could become involved in delivery and/or assessment. These suggestions are not exhaustive and there will be other possibilities at local level.

Employer involvement in these units is subject to verification as part of the standards verification process (see *Section 8*).

Definition

Activities that are eligible to be counted as meaningful engagement are:

- structured work experience or work placements that develop skills and knowledge relevant to the qualification
- projects or assessments set with input from industry practitioners
- masterclasses or guest lectures from industry practitioners
- 'expert witness' reports from practitioners that contribute to the assessment of a learner's work.

There may be other ways in which learners can benefit from contact with employers or prepare for employment, such as listening to careers talks or working in simulated environments. While they provide benefits to learners they do not count as meaningful engagement.

Support

It is important that you give learners opportunities that are high quality and directly relevant to their study. We will support you in this through guidance materials and by giving you examples of best practice.

What support is available?

We provide a wealth of support materials, including curriculum plans, delivery guides, authorised assignment briefs, additional papers for external assessments and examples of marked learner work.

You will be allocated a Standards Verifier early on in the planning stage to support you with planning your assessments. There will be extensive training programmes as well as support from our Subject Advisor team.

For further details see *Section 10*.

How will my learners become more employable through these qualifications?

All BTEC Nationals are mapped to relevant occupational standards (see *Appendix 1*).

In the mandatory content and the selected optional units that focus on technical preparation learners will be acquiring the key knowledge and skills that employers need. Also, employability skills, such as team working and entrepreneurialism, and completing realistic tasks, have been built into the design of the learning aims and content. This gives you the opportunity to use relevant contexts, scenarios and materials to enable learners to develop a portfolio of evidence that demonstrates the breadth of their skills and knowledge in a way that equips them for employment.

5 Assessment structure and external assessment

Introduction

BTEC Nationals are assessed using a combination of *internal assessments*, which are set and marked by teachers, and *external assessments* which are set and marked by Pearson:

- mandatory units have a combination of internal and external assessments
- all optional units are internally assessed.

We have taken great care to ensure that the assessment method chosen is appropriate to the content of the unit and in line with requirements from employers and higher education.

In developing an overall plan for delivery and assessment for the programme, you will need to consider the order in which you deliver units, whether delivery is over short or long periods and when assessment can take place. Some units are defined as synoptic units (see *Section 2*). Normally, a synoptic assessment is one that a learner would take later in a programme and in which they will be expected to apply learning from a range of units. Synoptic units may be internally or externally assessed. Where a unit is externally assessed you should refer to the sample assessment materials (SAMs) to identify where there is an expectation that learners draw on their wider learning. For internally-assessed units, you must plan the assignments so that learners can demonstrate learning from across their programme. A unit may be synoptic in one qualification and not another because of the relationship it has to the rest of the qualification.

We have addressed the need to ensure that the time allocated to final assessment of internal and external units is reasonable so that there is sufficient time for teaching and learning, formative assessment and development of transferable skills.

In administering internal and external assessment, the centre needs to be aware of the specific procedures and policies that apply, for example to registration, entries and results. An overview with signposting to relevant documents is given in *Section 7*.

Internal assessment

Our approach to internal assessment for these qualifications will be broadly familiar to experienced centres. It offers flexibility in how and when you assess learners, provided that you meet assessment and quality assurance requirements. You will need to take account of the requirements of the unit format, which we explain in *Section 3*, and the requirements for delivering assessment given in *Section 6*.

External assessment

A summary of the external assessment for this qualification is given in *Section 2*. You should check this information carefully, together with the unit specification and the sample assessment materials, so that you can timetable learning and assessment periods appropriately.

Learners must be prepared for external assessment by the time they undertake it. In preparing learners for assessment you will want to take account of required learning time, the relationship with other external assessments and opportunities for retaking. You should ensure that learners are not entered for unreasonable amounts of external assessment in one session. Learners may resit an external assessment to obtain a higher grade of near pass or above. If a learner has more than one attempt, then the best result will be used for qualification grading, up to the permitted maximum. It is unlikely that learners will need to or benefit from taking all assessments twice so you are advised to plan appropriately. Some assessments are synoptic and learners are likely to perform best if these assessments are taken towards the end of the programme.

Key features of external assessment in horticulture

In horticulture, after consultation with stakeholders, we have developed the following.

- *Unit 1: Professional Working Responsibilities* – learners complete written tasks examining their knowledge and skills in the areas of professional working practice, personal welfare, and responsibilities for themselves, others and the environment. The unit provides crucial knowledge and skills for the wide-ranging roles found in the horticulture sector.
- *Unit 2: Plant and Soil Science* – learners complete a written examination demonstrating their knowledge of plant structures, systemic processes, and nutrition and soil composition and management. The unit provides fundamental knowledge of the processes for healthy plant growth, which is important for the wide-ranging roles in horticulture, such as groundskeeper.

Units

The externally-assessed units have a specific format which we explain in *Section 3*. The content of the units will be sampled across external assessments over time through appropriate papers and tasks. The ways in which learners are assessed are shown through the assessment outcomes and grading descriptors. External assessments are marked and awarded using the grade descriptors. The grades available are Distinction (D), Merit (M), Pass (P) and Near Pass (N). The Near Pass (N) grade gives learners credit below a Pass, where they have demonstrated evidence of positive performance which is worth more than an unclassified result but not yet at the Pass standard.

Sample assessment materials

Each externally-assessed unit has a set of sample assessment materials (SAMs) that accompanies this specification. The SAMs are there to give you an example of what the external assessment will look like in terms of the feel and level of demand of the assessment. In the case of units containing synoptic assessment, the SAMs will also show where learners are expected to select and apply from across the programme.

The SAMs show the range of possible question types that may appear in the actual assessments and give you a good indication of how the assessments will be structured. While SAMs can be used for practice with learners, as with any assessment the content covered and specific details of the questions asked will change in each assessment.

A copy of each of these assessments can be downloaded from our website. An additional sample of each of the Pearson-set units will be available before the first sitting of the assessment to allow your learners further opportunities for practice.

6 Internal assessment

This section gives an overview of the key features of internal assessment and how you, as an approved centre, can offer it effectively. The full requirements and operational information are given in the *Pearson Quality Assurance Handbook*. All members of the assessment team need to refer to this document.

For BTEC Nationals it is important that you can meet the expectations of stakeholders and the needs of learners by providing a programme that is practical and applied. Centres can tailor programmes to meet local needs and use links with local employers and the wider vocational sector.

When internal assessment is operated effectively it is challenging, engaging, practical and up to date. It must also be fair to all learners and meet national standards.

Principles of internal assessment

Assessment through assignments

For internally-assessed units, the format of assessment is an assignment taken after the content of the unit, or part of the unit if several assignments are used, has been delivered. An assignment may take a variety of forms, including practical and written types. An assignment is a distinct activity completed independently by learners that is separate from teaching, practice, exploration and other activities that learners complete with direction from, and formative assessment by, teachers.

An assignment is issued to learners as an assignment brief with a defined start date, a completion date and clear requirements for the evidence that they need to provide. There may be specific observed practical components during the assignment period. Assignments can be divided into tasks and may require several forms of evidence. A valid assignment will enable a clear and formal assessment outcome based on the assessment criteria.

Assessment decisions through applying unit-based criteria

Assessment decisions for BTEC Nationals are based on the specific criteria given in each unit and set at each grade level. To ensure that standards are consistent in the qualification and across the suite as a whole, the criteria for each unit have been defined according to a framework. The way in which individual units are written provides a balance of assessment of understanding, practical skills and vocational attributes appropriate to the purpose of qualifications.

The assessment criteria for a unit are hierarchical and holistic. For example, if an M criterion requires the learner to show 'analysis' and the related P criterion requires the learner to 'explain', then to satisfy the M criterion a learner will need to cover both 'explain' and 'analyse'. The unit assessment grid shows the relationships among the criteria so that assessors can apply all the criteria to the learner's evidence at the same time. In *Appendix 2* we have set out a definition of terms that assessors need to understand.

Assessors must show how they have reached their decisions using the criteria in the assessment records. When a learner has completed all the assessment for a unit then the assessment team will give a grade for the unit. This is given simply according to the highest level for which the learner is judged to have met all the criteria. Therefore:

- to achieve a Distinction, a learner must have satisfied all the Distinction criteria (and therefore the Pass and Merit criteria); these define outstanding performance across the unit as a whole
- to achieve a Merit, a learner must have satisfied all the Merit criteria (and therefore the Pass criteria) through high performance in each learning aim
- to achieve a Pass, a learner must have satisfied all the Pass criteria for the learning aims, showing coverage of the unit content and therefore attainment at Level 3 of the national framework.

The award of a Pass is a defined level of performance and cannot be given solely on the basis of a learner completing assignments. Learners who do not satisfy the Pass criteria should be reported as Unclassified.

The assessment team

It is important that there is an effective team for internal assessment. There are three key roles involved in implementing assessment processes in your centre, each with different interrelated responsibilities, the roles are listed below. Full information is given in the *Pearson Quality Assurance Handbook*.

- The Lead Internal Verifier (the Lead IV) has overall responsibility for the programme, its assessment and internal verification to meet our requirements, record keeping and liaison with the Standards Verifier. The Lead IV registers with Pearson annually. The Lead IV acts as an assessor, supports the rest of the assessment team, makes sure that they have the information they need about our assessment requirements and organises training, making use of our guidance and support materials.
- Internal Verifiers (IVs) oversee all assessment activity in consultation with the Lead IV. They check that assignments and assessment decisions are valid and that they meet our requirements. IVs will be standardised by working with the Lead IV. Normally, IVs are also assessors but they do not verify their own assessments.
- Assessors set or use assignments to assess learners to national standards. Before taking any assessment decisions, assessors participate in standardisation activities led by the Lead IV. They work with the Lead IV and IVs to ensure that the assessment is planned and carried out in line with our requirements.

Effective organisation

Internal assessment needs to be well organised so that the progress of learners can be tracked and so that we can monitor that assessment is being carried out in line with national standards. We support you through, for example, providing training materials and sample documentation. Our online myBTEC service can help support you in planning and record keeping.
Further information on using myBTEC can be found in *Section 10* and on our website.

It is particularly important that you manage the overall assignment programme and deadlines to make sure that learners are able to complete assignments on time.

Learner preparation

To ensure that you provide effective assessment for your learners, you need to make sure that they understand their responsibilities for assessment and the centre's arrangements.

From induction onwards, you will want to ensure that learners are motivated to work consistently and independently to achieve the requirements of the qualifications. Learners need to understand how assignments are used, the importance of meeting assignment deadlines, and that all the work submitted for assessment must be their own.

You will need to give learners a guide that explains how assignments are used for assessment, how assignments relate to the teaching programme, and how learners should use and reference source materials, including what would constitute plagiarism. The guide should also set out your approach to operating assessment, such as how learners must submit work and request extensions.

Setting effective assignments

Setting the number and structure of assignments

In setting your assignments, you need to work with the structure of assignments shown in the *Essential information for assignments* section of a unit. This shows the structure of the learning aims and criteria that you must follow and the recommended number of assignments that you should use. For some units we provide authorised assignment briefs, for all the units we give you suggestions on how to create suitable assignments. You can find these materials along with this specification on our website. In designing your own assignment briefs you should bear in mind the following points.

- The number of assignments for a unit must not exceed the number shown in *Essential information for assignments*. However, you may choose to combine assignments, for example to create a single assignment for the whole unit.
- You may also choose to combine all or parts of different units into single assignments, provided that all units and all their associated learning aims are fully addressed in the programme overall. If you choose to take this approach you need to make sure that learners are fully prepared so that they can provide all the required evidence for assessment and that you are able to track achievement in the records.
- A learning aim must always be assessed as a whole and must not be split into two or more tasks.
- The assignment must be targeted to the learning aims but the learning aims and their associated criteria are not tasks in themselves. Criteria are expressed in terms of the outcome shown in the evidence.
- You do not have to follow the order of the learning aims of a unit in setting assignments but later learning aims often require learners to apply the content of earlier learning aims and they may require learners to draw their learning together.
- Assignments must be structured to allow learners to demonstrate the full range of achievement at all grade levels. Learners need to be treated fairly by being given the opportunity to achieve a higher grade if they have the ability.
- As assignments provide a final assessment, they will draw on the specified range of teaching content for the learning aims. The specified content is compulsory. The evidence for assessment need not cover every aspect of the teaching content as learners will normally be given particular examples, case studies or contexts in their assignments. For example, if a learner is carrying out one practical performance, or an investigation of one organisation, then they will address all the relevant range of content that applies in that instance.

Providing an assignment brief

A good assignment brief is one that, through providing challenging and realistic tasks, motivates learners to provide appropriate evidence of what they have learned.

An assignment brief should have:

- a vocational scenario, this could be a simple situation or a full, detailed set of vocational requirements that motivates the learner to apply their learning through the assignment
- clear instructions to the learner about what they are required to do, normally set out through a series of tasks
- an audience or purpose for which the evidence is being provided
- an explanation of how the assignment relates to the unit(s) being assessed.

Forms of evidence

BTEC Nationals have always allowed for a variety of forms of evidence to be used, provided that they are suited to the type of learning aim being assessed. For many units, the practical demonstration of skills is necessary and for others, learners will need to carry out their own research and analysis. The units give you information on what would be suitable forms of evidence to provide learners with the opportunity to apply a range of employability or transferable skills. Centres may choose to use different suitable forms for evidence to those proposed. Overall, learners should be assessed using varied forms of evidence.

Full definitions of types of assessment are given in *Appendix 2*. These are some of the main types of assessment:

- written reports
- projects
- time-constrained practical assessments with observation records and supporting evidence
- recordings of performance
- sketchbooks, working logbooks, reflective journals
- presentations with assessor questioning.

The form(s) of evidence selected must:

- allow the learner to provide all the evidence required for the learning aim(s) and the associated assessment criteria at all grade levels
- allow the learner to produce evidence that is their own independent work
- allow a verifier to independently reassess the learner to check the assessor's decisions.

For example, when you are using performance evidence, you need to think about how supporting evidence can be captured through recordings, photographs or task sheets.

Centres need to take particular care that learners are enabled to produce independent work. For example, if learners are asked to use real examples, then best practice would be to encourage them to use their own or to give the group a number of examples that can be used in varied combinations.

Making valid assessment decisions

Authenticity of learner work

Once an assessment has begun, learners must not be given feedback on progress towards fulfilling the targeted criteria.

An assessor must assess only learner work that is authentic, i.e. learners' own independent work. Learners must authenticate the evidence that they provide for assessment through signing a declaration stating that it is their own work.

Assessors must ensure that evidence is authentic to a learner through setting valid assignments and supervising them during the assessment period. Assessors must take care not to provide direct input, instructions or specific feedback that may compromise authenticity.

Assessors must complete a declaration that:

- the evidence submitted for this assignment is the learner's own
- the learner has clearly referenced any sources used in the work
- they understand that false declaration is a form of malpractice.

Centres can use Pearson templates or their own templates to document authentication.

During assessment, an assessor may suspect that some or all of the evidence from a learner is not authentic. The assessor must then take appropriate action using the centre's policies for malpractice. Further information is given in *Section 7*.

Making assessment decisions using criteria

Assessors make judgements using the criteria. The evidence from a learner can be judged using all the relevant criteria at the same time. The assessor needs to make a judgement against each criterion that evidence is present and sufficiently comprehensive. For example, the inclusion of a concluding section may be insufficient to satisfy a criterion requiring 'evaluation'.

Assessors should use the following information and support in reaching assessment decisions:

- the *Essential information for assessment decisions* section in each unit gives examples and definitions related to terms used in the criteria
- the explanation of key terms in *Appendix 2*
- examples of assessed work provided by Pearson
- your Lead IV and assessment team's collective experience, supported by the standardisation materials we provide.

Pass and Merit criteria relate to individual learning aims. The Distinction criteria as a whole relate to outstanding performance across the unit. Therefore, criteria may relate to more than one learning aim (for example A.D1) or to several learning aims (for example DE.D3). Distinction criteria make sure that learners have shown that they can perform consistently at an outstanding level across the unit and/or that they are able to draw learning together across learning aims.

Dealing with late completion of assignments

Learners must have a clear understanding of the centre policy on completing assignments by the deadlines that you give them. Learners may be given authorised extensions for legitimate reasons, such as illness at the time of submission, in line with your centre policies.

For assessment to be fair, it is important that learners are all assessed in the same way and that some learners are not advantaged by having additional time or the opportunity to learn from others. Therefore, learners who do not complete assignments by your planned deadline or the authorised extension deadline may not have the opportunity to subsequently resubmit.

If you accept a late completion by a learner, then the assignment should be assessed normally when it is submitted using the relevant assessment criteria.

Issuing assessment decisions and feedback

Once the assessment team has completed the assessment process for an assignment, the outcome is a formal assessment decision. This is recorded formally and reported to learners.

The information given to the learner:

- must show the formal decision and how it has been reached, indicating how or where criteria have been met
- may show why attainment against criteria has not been demonstrated
- must not provide feedback on how to improve evidence
- must be validated by an IV before it is given to the learner.

Resubmission of improved evidence

An assignment provides the final assessment for the relevant learning aims and is normally a final assessment decision, except where the Lead IV approves one opportunity to resubmit improved evidence based on the completed assignment brief.

The Lead IV has the responsibility to make sure that resubmission is operated fairly. This means:

- checking that a learner can be reasonably expected to perform better through a second submission, for example that the learner has not performed as expected
- making sure that giving a further opportunity can be done in such a way that it does not give an unfair advantage over other learners, for example through the opportunity to take account of feedback given to other learners
- checking that the assessor considers that the learner will be able to provide improved evidence without further guidance and that the original evidence submitted remains valid.

Once an assessment decision has been given to the learner, the resubmission opportunity must have a deadline within 15 working days in the same academic year.

A resubmission opportunity must not be provided where learners:

- have not completed the assignment by the deadline without the centre's agreement
- have submitted work that is not authentic.

Retake of internal assessment

A learner who has not achieved the level of performance required to pass the relevant learning aims after resubmission of an assignment may be offered a single retake opportunity using a new assignment. The retake may only be achieved at a pass.

The Lead Internal Verifier must only authorise a retake of an assignment in exceptional circumstances where they believe it is necessary, appropriate and fair to do so. For further information on offering a retake opportunity, you should refer to the *BTEC Centre Guide to Assessment*. We provide information on writing assignments for retakes on our website (www.btec.co.uk/keydocuments).

Planning and record keeping

For internal processes to be effective, an assessment team needs to be well organised and keep effective records. The centre will also work closely with us so that we can quality assure that national standards are being satisfied. This process gives stakeholders confidence in the assessment approach.

The Lead IV must have an assessment plan, produced as a spreadsheet or using myBTEC. When producing a plan, the assessment team may wish to consider:

- the time required for training and standardisation of the assessment team
- the time available to undertake teaching and carry out assessment, taking account of when learners may complete external assessments and when quality assurance will take place
- the completion dates for different assignments
- who is acting as IV for each assignment and the date by which the assignment needs to be verified
- setting an approach to sampling assessor decisions though internal verification that covers all assignments, assessors and a range of learners
- how to manage the assessment and verification of learners' work so that they can be given formal decisions promptly
- how resubmission opportunities can be scheduled.

The Lead IV will also maintain records of assessment undertaken. The key records are:

- verification of assignment briefs
- learner authentication declarations
- assessor decisions on assignments, with feedback given to learners
- verification of assessment decisions.

Examples of records and further information are given in the *Pearson Quality Assurance Handbook.*

7 Administrative arrangements

Introduction

This section focuses on the administrative requirements for delivering a BTEC qualification. It will be of value to Quality Nominees, Lead IVs, Programme Leaders and Examinations Officers.

Learner registration and entry

Shortly after learners start the programme of learning, you need to make sure that they are registered for the qualification and that appropriate arrangements are made for internal and external assessment. You need to refer to the *Information Manual* for information on making registrations for the qualification and entries for external assessments.

Learners can be formally assessed only for a qualification on which they are registered. If learners' intended qualifications change, for example if a learner decides to choose a different pathway specialism, then the centre must transfer the learner appropriately.

Access to assessment

Both internal and external assessments need to be administered carefully to ensure that all learners are treated fairly, and that results and certification are issued on time to allow learners to progress to chosen progression opportunities.

Our equality policy requires that all learners should have equal opportunity to access our qualifications and assessments, and that our qualifications are awarded in a way that is fair to every learner. We are committed to making sure that:

- learners with a protected characteristic are not, when they are undertaking one of our qualifications, disadvantaged in comparison to learners who do not share that characteristic
- all learners achieve the recognition they deserve for undertaking a qualification and that this achievement can be compared fairly to the achievement of their peers.

Further information on access arrangements can be found in the Joint Council for Qualifications (JCQ) document *Access Arrangements, Reasonable Adjustments and Special Consideration for General and Vocational Qualifications*.

Administrative arrangements for internal assessment

Records

You are required to retain records of assessment for each learner. Records should include assessments taken, decisions reached and any adjustments or appeals. Further information can be found in the *Information Manual.* We may ask to audit your records so they must be retained as specified.

Reasonable adjustments to assessment

A reasonable adjustment is one that is made before a learner takes an assessment to ensure that they have fair access to demonstrate the requirements of the assessments. You are able to make adjustments to internal assessments to take account of the needs of individual learners. In most cases this can be achieved through a defined time extension or by adjusting the format of evidence. We can advise you if you are uncertain as to whether an adjustment is fair and reasonable. You need to plan for time to make adjustments if necessary.

Further details on how to make adjustments for learners with protected characteristics are given on our website in the document *Supplementary guidance for reasonable adjustment and special consideration in vocational internally-assessed units.*

Special consideration

Special consideration is given after an assessment has taken place for learners who have been affected by adverse circumstances, such as illness. You must operate special consideration in line with our policy (see previous paragraph). You can provide special consideration related to the period of time given for evidence to be provided or for the format of the assessment if it is equally valid. You may not substitute alternative forms of evidence to that required in a unit, or omit the application of any assessment criteria to judge attainment. Pearson can consider applications for special consideration in line with the policy.

Appeals against assessment

Your centre must have a policy for dealing with appeals from learners. These appeals may relate to assessment decisions being incorrect or assessment not being conducted fairly. The first step in such a policy could be a consideration of the evidence by a Lead IV or other member of the programme team. The assessment plan should allow time for potential appeals after assessment decisions have been given to learners. If there is an appeal by a learner, you must document the appeal and its resolution. Learners have a final right of appeal to Pearson but only if the procedures that you have put in place have not been followed. Further details are given in the document *Enquiries and appeals about Pearson vocational qualifications and end point assessment policy*.

Administrative arrangements for external assessment

Entries and resits

For information on the timing of assessment and entries, please refer to the annual examinations timetable on our website.

Access arrangements requests

Access arrangements are agreed with Pearson before an assessment. They allow students with special educational needs, disabilities or temporary injuries to:

- access the assessment
- show what they know and can do without changing the demands of the assessment.

Access arrangements should always be processed at the time of registration. Learners will then know what type of arrangements are available in place for them.

Granting reasonable adjustments

For external assessment, a reasonable adjustment is one that we agree to make for an individual learner. A reasonable adjustment is defined for the individual learner and informed by the list of available access arrangements.

Whether an adjustment will be considered reasonable will depend on a number of factors, to include:

- the needs of the learner with the disability
- the effectiveness of the adjustment
- the cost of the adjustment; and
- the likely impact of the adjustment on the learner with the disability and other learners.

Adjustment may be judged unreasonable and not approved if it involves unreasonable costs, timeframes or affects the integrity of the assessment.

Special consideration requests

Special consideration is an adjustment made to a student's mark or grade after an external assessment to reflect temporary injury, illness or other indisposition at the time of the assessment. An adjustment is made only if the impact on the learner is such that it is reasonably likely to have had a material effect on that learner being able to demonstrate attainment in the assessment.

Centres are required to notify us promptly of any learners who they believe have been adversely affected and request that we give special consideration. Further information can be found in the special requirements section on our website.

Conducting external assessments

Centres must make arrangements for the secure delivery of external assessments. External assessments for BTEC qualifications include examinations, set tasks and performance.

Each external assessment has a defined degree of control under which it must take place. Some external assessments may have more than one part and each part may have a different degree of control. We define degrees of control as follows.

High control

This is the completion of assessment in formal invigilated examination conditions.

Medium control

This is completion of assessment, usually over a longer period of time, which may include a period of controlled conditions. The controlled conditions may allow learners to access resources, prepared notes or the internet to help them complete the task.

Low control

These are activities completed without direct supervision. They may include research, preparation of materials and practice. The materials produced by learners under low control will not be directly assessed.

Further information on responsibilities for conducting external assessment is given in the document *Instructions for Conducting External Assessments*, available on our website.

Dealing with malpractice in assessment

Malpractice means acts that undermine the integrity and validity of assessment, the certification of qualifications, and/or that may damage the authority of those responsible for delivering the assessment and certification.

Pearson does not tolerate actions (or attempted actions) of malpractice by learners, centre staff or centres in connection with Pearson qualifications. Pearson may impose penalties and/or sanctions on learners, centre staff or centres where incidents (or attempted incidents) of malpractice have been proven.

Malpractice may arise or be suspected in relation to any unit or type of assessment within the qualification. For further details regarding malpractice and advice on preventing malpractice by learners please see Pearson's *Centre guidance: Dealing with malpractice and maladministration in vocational qualifications*, available on our website.

The procedures we ask you to adopt vary between units that are internally assessed and those that are externally assessed.

Internally-assessed units

Centres are required to take steps to prevent malpractice and to investigate instances of suspected malpractice. Learners must be given information that explains what malpractice is for internal assessment and how suspected incidents will be dealt with by the centre. The *Centre Guidance: Dealing with Malpractice* document gives full information on the actions we expect you to take.

Pearson may conduct investigations if we believe that a centre is failing to conduct internal assessment according to our policies. The above document gives further information, examples and details the penalties and sanctions that may be imposed.

In the interests of learners and centre staff, centres need to respond effectively and openly to all requests relating to an investigation into an incident of suspected malpractice.

Externally-assessed units

External assessment means all aspects of units that are designated as external in this specification, including preparation for tasks and performance. For these assessments, centres must follow the JCQ procedures set out in the latest version of *JCQ Suspected Malpractice in Examinations and Assessments Policies and Procedures* (www.jcq.org.uk).

In the interests of learners and centre staff, centres need to respond effectively and openly to all requests relating to an investigation into an incident of suspected malpractice.

Learner malpractice

Heads of Centres are required to report incidents of any suspected learner malpractice that occur during Pearson external assessments. We ask that centres do so by completing a *JCQ Form M1* (available at www.jcq.org.uk/exams-office/malpractice) and emailing it and any accompanying documents (signed statements from the learner, invigilator, copies of evidence, etc.) to the Investigations Team at candidatemalpractice@pearson.com. The responsibility for determining appropriate sanctions or penalties to be imposed on learners lies with Pearson.

Learners must be informed at the earliest opportunity of the specific allegation and the centre's malpractice policy, including the right of appeal. Learners found guilty of malpractice may be disqualified from the qualification for which they have been entered with Pearson.

Teacher/centre malpractice

Heads of Centres are required to inform Pearson's Investigations Team of any incident of suspected malpractice by centre staff, before any investigation is undertaken. Heads of centres are requested to inform the Investigations Team by submitting a *JCQ Form M2(a)* (available at www.jcq.org.uk/exams-office/malpractice) with supporting documentation to pqsmalpractice@pearson.com. Where Pearson receives allegations of malpractice from other sources (for example Pearson staff or anonymous informants), the Investigations Team will conduct the investigation directly or may ask the head of centre to assist.

Incidents of maladministration (accidental errors in the delivery of Pearson qualifications that may affect the assessment of learners) should also be reported to the Investigations Team using the same method.

Heads of Centres/Principals/Chief Executive Officers or their nominees are required to inform learners and centre staff suspected of malpractice of their responsibilities and rights; see Section 6.15 of the *JCQ Suspected Malpractice in Examinations and Assessments Policies and Procedures* document.

Pearson reserves the right in cases of suspected malpractice to withhold the issuing of results and/or certificates while an investigation is in progress. Depending on the outcome of the investigation results and/or certificates may be released or withheld.

You should be aware that Pearson may need to suspend certification when undertaking investigations, audits and quality assurances processes. You will be notified within a reasonable period of time if this occurs.

Sanctions and appeals

Where malpractice is proven we may impose sanctions or penalties.

Where learner malpractice is evidenced, penalties may be imposed such as:

- mark reduction for external assessments
- disqualification from the qualification
- being barred from registration for Pearson qualifications for a period of time.

If we are concerned about your centre's quality procedures we may impose sanctions such as:

- working with you to create an improvement action plan
- requiring staff members to receive further training
- placing temporary blocks on your certificates
- placing temporary blocks on registration of learners
- debarring staff members or the centre from delivering Pearson qualifications
- suspending or withdrawing centre approval status.

The centre will be notified if any of these apply.

Pearson has established procedures for centres that are considering appeals against penalties and sanctions arising from malpractice. Appeals against a decision made by Pearson will normally be accepted only from Heads of Centres (on behalf of learners and/or members of staff) and from individual members (in respect of a decision taken against them personally). Further information on appeals can be found in our *Enquiries and appeals about Pearson vocational qualifications and end point assessment policy*, which is on our website. In the initial stage of any aspect of malpractice, please notify the Investigations Team by email via pqsmalpractice@pearson.com who will inform you of the next steps.

Certification and results

Once a learner has completed all the required components for a qualification, even if final results for external assessments have not been issued, then the centre can claim certification for the learner, provided that quality assurance has been successfully completed. For the relevant procedures please refer to our *Information Manual*. You can use the information provided on qualification grading to check overall qualification grades.

Results issue

After the external assessment session, learner results will be issued to centres. The result will be in the form of a grade. You should be prepared to discuss performance with learners, making use of the information we provide and post-results services.

Post-assessment services

Once results for external assessments are issued, you may find that the learner has failed to achieve the qualification or to attain an anticipated grade. It is possible to transfer or reopen registration in some circumstances. The *Information Manual* gives further information.

Changes to qualification requests

Where a learner who has taken a qualification wants to resit an externally-assessed unit to improve their qualification grade, you firstly need to decline their overall qualification grade. You may decline the grade before the certificate is issued. For a learner receiving their results in August, you should decline the grade by the end of September if the learner intends to resit an external assessment.

Additional documents to support centre administration

As an approved centre you must ensure that all staff delivering, assessing and administering the qualifications have access to this documentation. These documents are reviewed annually and are reissued if updates are required.

- *Pearson Quality Assurance Handbook*: this sets out how we will carry out quality assurance of standards and how you need to work with us to achieve successful outcomes.
- *Information Manual*: this gives procedures for registering learners for qualifications, transferring registrations, entering for external assessments and claiming certificates.
- *Lead Examiners' Reports*: these are produced after each series for each external assessment and give feedback on the overall performance of learners in response to tasks or questions set.
- *Instructions for the Conduct of External Assessments (ICEA)*: this explains our requirements for the effective administration of external assessments, such as invigilation and submission of materials.
- *Regulatory policies*: our regulatory policies are integral to our approach and explain how we meet internal and regulatory requirements. We review the regulated policies annually to ensure that they remain fit for purpose. Policies related to this qualification include:
  - adjustments for candidates with disabilities and learning difficulties, access arrangements and reasonable adjustments for general and vocational qualifications
  - age of learners
  - centre guidance for dealing with malpractice
  - recognition of prior learning and process.

This list is not exhaustive and a full list of our regulatory policies can be found on our website.

8 Quality assurance

Centre and qualification approval

As part of the approval process, your centre must make sure that the resource requirements listed below are in place before offering the qualification.

- Centres must have appropriate physical resources (for example, equipment, IT, learning materials, teaching rooms) to support the delivery and assessment of the qualification.
- Staff involved in the assessment process must have relevant expertise and/or occupational experience.
- There must be systems in place to ensure continuing professional development for staff delivering the qualification.
- Centres must have in place appropriate health and safety policies relating to the use of equipment by learners.
- Centres must deliver the qualification in accordance with current equality legislation.
- Centres should refer to the teacher guidance section in individual units to check for any specific resources required.

Continuing quality assurance and standards verification

On an annual basis, we produce the *Pearson Quality Assurance Handbook.* It contains detailed guidance on the quality processes required to underpin planning for delivery including appropriate employer involvement, and for robust assessment and internal verification.

The key principles of quality assurance are that:

- a centre delivering BTEC programmes must be an approved centre, and must have approval for the programmes or groups of programmes that it is delivering
- the centre agrees, as part of gaining approval, to abide by specific terms and conditions around the effective delivery and quality assurance of assessment; it must abide by these conditions throughout the period of delivery
- Pearson makes available to approved centres a range of materials and opportunities, through online standardisation, 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 the planning, monitoring and recording of assessment processes, and for dealing with special circumstances, appeals and malpractice.

The approach of quality-assured assessment is through a partnership between an approved centre and Pearson. We will make sure that each centre follows best practice and employs appropriate technology to support quality-assurance processes, where practicable. We work to support centres and seek to make sure that our quality-assurance processes do not place undue bureaucratic processes on centres. We monitor and support centres in the effective operation of assessment and quality assurance.

The methods we use to do this for BTEC Level 3 include:

- making sure that all centres complete appropriate declarations at the time of approval
- undertaking approval visits to centres
- making sure that centres have effective teams of assessors and verifiers who are trained to undertake assessment
- undertaking an overarching review and assessment of a centre's strategy for ensuring sufficient and appropriate engagement with employers at the beginning of delivery of any BTEC programme(s)
- undertaking a review of the employer involvement planned at programme level to ensure its appropriateness at a time when additional activities can be scheduled where necessary
- assessment sampling and verification, through requested samples of assessments, completed assessed learner work and associated documentation

- an overarching review and assessment of a centre's strategy for delivering and quality assuring its BTEC programmes, for example making sure that synoptic units are placed appropriately in the order of delivery of the programme.

Centres that do not fully address and maintain rigorous approaches to delivering, assessing and quality assurance cannot seek certification for individual programmes or for all BTEC Level 3 programmes. An approved centre must make certification claims only when authorised by us and strictly in accordance with requirements for reporting.

Centres that do not comply with remedial action plans may have their approval to deliver qualifications removed.

9 Understanding the qualification grade

Awarding and reporting for the qualification

This section explains the rules that we apply in awarding a qualification and in providing an overall qualification grade for each learner. It shows how all the qualifications in this sector are graded.

The awarding and certification of these qualifications will comply with regulatory requirements.

Eligibility for an award

In order to be awarded a qualification, a learner must complete all units, achieve a Near Pass (N) or above in all external units and a pass or above in all mandatory units unless otherwise specified. Refer to the structure in *Section 2*.

To achieve any qualification grade, learners must:

- complete and **have an outcome** (D, M, P, N or U) for all units within a valid combination
- achieve the **required units at pass or above** shown in *Section 2*, and for the Diploma achieve a minimum of 600 GLH and Extended Diploma achieve a minimum 900 GLH at Pass or above (or N or above in external units)
- achieve the **minimum number of points** at a grade threshold.

It is the responsibility of a centre to ensure that a correct unit combination is adhered to. Learners who do not achieve the required minimum grade (N or P) in units shown in the structure will not achieve a qualification.

Learners who do not achieve sufficient points for a qualification or who do not achieve all the required units may be eligible to achieve a smaller qualification in the same suite provided they have completed and achieved the correct combination of units and met the appropriate qualification grade points threshold.

Calculation of the qualification grade

The final grade awarded for a qualification represents an aggregation of a learner's performance across the qualification. As the qualification grade is an aggregate of the total performance, there is some element of compensation in that a higher performance in some units may be balanced by a lower outcome in others.

In the event that a learner achieves more than the required number of optional units, the mandatory units along with the optional units with the highest grades will be used to calculate the overall result, subject to the eligibility requirements for that particular qualification title.

BTEC Nationals are Level 3 qualifications and are awarded at the grade ranges shown in the table below.

Qualification	Available grade range
Certificate, Extended Certificate, Foundation Diploma	P to D*
Diploma	PP to D*D*
Extended Diploma	PPP to D*D*D*

The *Calculation of qualification grade* table, shown further on in this section, shows the minimum thresholds for calculating these grades. The table will be kept under review over the lifetime of the qualification. The most up to date table will be issued on our website.

Pearson will monitor the qualification standard and reserves the right to make appropriate adjustments.

Learners who do not meet the minimum requirements for a qualification grade to be awarded will be recorded as Unclassified (U) and will not be certificated. They may receive a Notification of Performance for individual units. The *Information Manual* gives full information.

Points available for internal units

The table below shows the number of **points** available for internal units. For each internal unit, points are allocated depending on the grade awarded.

	Unit size	
	60 GLH	**90 GLH**
U	0	0
Pass	6	9
Merit	10	15
Distinction	16	24

Points available for external units

Raw marks from the external units will be awarded **points** based on performance in the assessment. The table below shows the **minimum number of points** available for each grade in the external units.

	Unit size	
	90 GLH	**120 GLH**
U	0	0
Near Pass	6	8
Pass	9	12
Merit	15	20
Distinction	24	32

Pearson will automatically calculate the points for each external unit once the external assessment has been marked and grade boundaries have been set. For more details about how we set grade boundaries in the external assessment please go to our website.

Claiming the qualification grade

Subject to eligibility, Pearson will automatically calculate the qualification grade for your learners when the internal unit grades are submitted and the qualification claim is made. Learners will be awarded qualification grades for achieving the sufficient number of points within the ranges shown in the relevant *Calculation of qualification grade* table for the cohort.

Calculation of qualification grade

Applicable for registration from 1 September 2019.

Extended Certificate		Foundation Diploma		Diploma		Extended Diploma	
360 GLH		540 GLH		720 GLH		1080 GLH	
Grade	**Points threshold**	**Grade**	**Points threshold**	**Grade**	**Points threshold**	**Grade**	**Points threshold**
U	0	U	0	U	0	U	0
Pass	36	P	54	PP	72	PPP	108
				MP	88	MPP	124
						MMP	140
Merit	52	M	78	MM	104	MMM	156
				DM	124	DMM	176
						DDM	196
Distinction	74	D	108	DD	144	DDD	216
				D*D	162	D*DD	234
						D*D*D	252
D*	90	D*	138	D*D*	180	D*D*D*	270

The table is subject to review over the lifetime of the qualification. The most up-to-date version will be issued on our website.

Examples of grade calculations based on table applicable to registrations from September 2019

Example 1: Achievement of a Foundation Diploma with a P grade

	GLH	Type (Int/Ext)	Grade	Unit points
Unit 1	120	Ext	Pass	12
Unit 2	120	Ext	Pass	12
Unit 4	60	Int	Unclassified	0
Unit 6	60	Int	Pass	6
Unit 7	60	Int	Pass	6
Unit 10	60	Int	Distinction	16
Unit 12	60	Int	Merit	10
Totals	**540**		**P**	**62**

The learner has achieved N or higher in Units 1 and 2, and P or higher in Units 6 and 7.

The learner has sufficient points for a P grade.

Example 2: Achievement of a Foundation Diploma with a D grade

	GLH	Type (Int/Ext)	Grade	Unit points
Unit 1	120	Ext	Near Pass	8
Unit 2	120	Ext	Distinction	32
Unit 4	60	Int	Merit	10
Unit 6	60	Int	Distinction	16
Unit 7	60	Int	Distinction	16
Unit 8	60	Int	Distinction	16
Unit 15	60	Int	Merit	10
Totals	**540**		**D**	**108**

The learner has sufficient points for a D grade.

Example 3: An Unclassified result for a Foundation Diploma

	GLH	Type (Int/Ext)	Grade	Unit points
Unit 1	120	Ext	Merit	20
Unit 2	120	Ext	U	0
Unit 4	60	Int	Pass	6
Unit 6	60	Int	Distinction	16
Unit 7	60	Int	Distinction	16
Unit 9	60	Int	Distinction	16
Unit 11	60	Int	Pass	6
Totals	**540**		**U**	**80**

The learner has a U in Unit 2.

The learner has sufficient points for an M grade but has not met the minimum requirement for N or higher in Units 1 and 2, and P or higher in Units 6 and 7.

10 Resources and support

Our aim is to give you a wealth of resources and support to enable you to deliver BTEC National qualifications with confidence. On our website you will find a list of resources to support teaching and learning, and professional development.

Support for setting up your course and preparing to teach

Specification

This **specification** (for teaching from September 2019) includes details on the administration of qualifications and information on all the units for the qualification.

Delivery Guide

This free guide gives you important advice on how to choose the right course for your learners and how to ensure you are fully prepared to deliver the course. It explains the key features of BTEC Nationals (for example employer involvement and employability skills). It also covers guidance on assessment (internal and external) and quality assurance. The guide tells you where you can find further support and gives detailed unit-by-unit delivery guidance. It includes teaching tips and ideas, assessment preparation and suggestions for further resources.

Schemes of work

Free sample schemes of work are provided for each mandatory unit. These are available in Word™ format for ease of customisation.

Curriculum models

These show how the BTECs in the suite fit into a 16–19 study programme, depending on their size and purpose. The models also show where other parts of the programme, such as work experience, maths and English, tutorial time and wider study, fit alongside the programme.

Study skills activities

A range of case studies and activities is provided; they are designed to help learners develop the study skills they need to successfully complete their BTEC course. The case studies and activities are provided in Word™ format for easy customisation.

myBTEC

myBTEC is a free, online toolkit that lets you plan and manage your BTEC provision from one place. It supports the delivery, assessment and quality assurance of BTECs in centres and supports teachers with the following activities:

- checking that a programme is using a valid combination of units
- creating and verifying assignment briefs (including access to a bank of authorised assignment briefs that can be customised)
- creating assessment plans and recording assessment decisions
- tracking the progress of every learner throughout their programme.

To find out more about myBTEC, visit the myBTEC page on the support services section of our website. We will add the new BTEC National specifications to myBTEC as soon as possible.

Support for teaching and learning

Pearson Learning Services provides a range of engaging resources to support BTEC Nationals, including:

- introductory guides to the Next Generation BTEC National approach to learning.

Teaching and learning resources are also available from a number of other publishers. Details of Pearson's own resources and of all endorsed resources can be found on our website.

Support for assessment

Sample assessment materials for externally-assessed units

Sample assessments are available for the Pearson-set units. One copy of each of these assessments can be downloaded from the website. For each suite an additional sample for one of the Pearson-set units is also available, allowing your learners further opportunities for practice.

Further sample assessments will be made available through our website on an ongoing basis.

Sample assessment materials for internally-assessed units

We do not prescribe the assessments for the internally-assessed units. Rather, we allow you to set your own, according to your learners' preferences and to link with your local employment profile.

We do provide a service in the form of Authorised Assignment Briefs, which are approved by Pearson Standards Verifiers. They are available via our website or free on myBTEC.

Sample marked learner work

To support you in understanding the expectation of the standard at each grade, examples of marked learner work at PM/MD grades are linked to the Authorised Assignment Briefs.

Training and support from Pearson

People to talk to

There are many people who are available to support you and provide advice and guidance on delivery of your BTEC Nationals. These include:

- Subject Advisors – available for all sectors. They understand all Pearson qualifications in their sector and so can answer sector-specific queries on planning, teaching, learning and assessment
- Standards Verifiers – they can support you with preparing your assignments, ensuring that your assessment plan is set up correctly, and support you in preparing learner work and providing quality assurance through sampling
- Curriculum Development Managers (CDMs) – they are regionally based and have a full overview of the BTEC qualifications and of the support and resources that Pearson provides. CDMs often run network events
- Customer Services – the 'Support for You' section of our website gives the different ways in which you can contact us for general queries. For specific queries, our service operators can direct you to the relevant person or department.

Training and professional development

Pearson provides a range of training and professional development events to support the introduction, delivery, assessment and administration of BTEC National qualifications. These sector-specific events, developed and delivered by specialists, are available both face to face and online.

'Getting Ready to Teach'

These events are designed to get teachers ready for delivery of the BTEC Nationals. They include an overview of the qualifications' structures, planning and preparation for internal and external assessment, and quality assurance.

Teaching and learning

Beyond the 'Getting Ready to Teach' professional development events, there are opportunities for teachers to attend sector- and role-specific events. These events are designed to connect practice to theory; they provide teacher support and networking opportunities with delivery, learning and assessment methodology.

Details of our training and professional development programme can be found on our website.

Appendix 1 Links to industry standards

BTEC Nationals have been developed in consultation with industry and appropriate sector bodies to ensure that the qualification content and approach to assessment aligns closely to the needs of employers. Where they exist, and are appropriate, National Occupational Standards (NOS) and professional body standards have been used to establish unit content.

In the horticulture sector, the following approach has been used: the mandatory content has been mapped to NOS to reflect the essential skills and knowledge needed for entry to employment.

Appendix 2 Glossary of terms used for internally-assessed units

This is a summary of the key terms used to define the requirements in the units.

Term	Definition
Analyse	Learners present the outcome of methodical and detailed examination, either: • breaking down a theme, topic or situation in order to interpret and study the interrelationships between the parts and/or • of information or data to interpret and study key trends and interrelationships. Analysis can be through performance, practice, written or, less commonly, verbal presentation.
Apply	Learners complete practical tasks drawing on knowledge of concepts and processes.
Assess	Learners present a careful consideration of varied factors or events that apply to a specific situation, or identify those which are the most important or relevant and arrive at a conclusion.
Carry out	Learners demonstrate skills through practical activities, in line with certain requirements. Learners do this in order to complete an identified activity or to demonstrate personal achievement for an audience.
Compare	Learners identify the main factors relating to two or more items/situations or aspects of a subject that is extended to explain the similarities, differences, advantages and disadvantages. This is used to show depth of knowledge through selection and isolation of characteristics.
Demonstrate	Learners' work, performance or practice evidences the ability to carry out and apply knowledge, understanding and/or skills in a practical situation.
Develop	Learners acquire and apply skills and understanding through practical activities that involve the use of concepts, processes or techniques to expand or progress something.
Evaluate	Learners' work draws on varied information, themes or concepts to consider aspects such as: • strengths or weaknesses • advantages or disadvantages • alternative actions • relevance or significance. Learners' enquiries should lead to a supported judgement showing relationship to its context. This will often be in a conclusion. Evidence of explanations could be through visual explanations with annotations, as well as written work, presentation, performance or practice.

Term	Definition
Examine	Learners select and apply knowledge to less familiar contexts.
Explain	Learners' work shows clear detail and gives reasons and/or evidence to support an opinion, view or argument. It could show how conclusions are drawn (arrived at). Learners show that they comprehend the origins, functions and objectives of a subject, and its suitability for purpose.
Explore	Learners apply their skills and/or knowledge in contexts involving practical research or investigation.
Justify	Learners give reasons or evidence to: • support an opinion • prove something right or reasonable.
Perform	Learners demonstrate a range of skills required to complete a given activity.
Plan	Learners create a way of doing a task or series of tasks to achieve specific requirements or objectives, showing progress from start to finish.
Produce	Learners' knowledge, understanding and/or skills are applied to develop a particular type of evidence, for example a proposal, plan, product, service or report.
Reflect	Learners consider their own performance and/or skills and development in relation to a specific scenario or scenarios and/or wider context(s). This may include feedback from others. There is often a requirement for learners to identify strengths and areas for improvement, along with a personal development or action plan.
Review	Learners make a formal assessment of work produced. The assessment allows learners to appraise existing information or prior events, and reconsider information with the intention of making changes, if necessary.
Select	Learners choose the best or most suitable option, whether this is of materials, techniques, equipment or processes. The options and choices should be based on specific criteria.
Undertake	Learners demonstrate skills through practical activities, often referring to given processes or techniques.

This is a key summary of the types of evidence used for BTEC Nationals.

Type of evidence	Definition and purpose
Case study	A specific example to which all learners must select and apply knowledge. Used to show application to a realistic context where direct experience cannot be gained.
Development log	A record kept by learners to show the process of development. Used to show method, self-management and skill development.
Individual project	A self-directed, large-scale activity requiring planning, research, exploration, outcome and review. Used to show self-management, project management and/or deep learning, including synopticity.
Log	A record made by learners of how a process of development was carried out, including experimental stages, testing, selection and rejection of alternatives, practice or development steps.
Plan	Learners produce a plan as an outcome related to a given or limited task.
Portfolio	Digital or physical, showing a selection of work that contributes towards a project or for a specific purpose.
Practical task (artefact/outcome)	Learners carry out a defined or self-defined task to produce an outcome.
Presentation	To show presentation skills, including communication. To direct to a given audience and goal. To extract and summarise information.
Project	A large-scale activity requiring planning, research, exploration, outcome and review. Used to show self-management, project management and/or deep learning, including synopticity.
Research	An analysis of substantive research organised by learners from secondary and, if applicable, primary sources.
Written task/report	Individual completion of a task in a work-related format, e.g. a report, marketing communication, set of instructions.

Pearson BTEC Level 3 Nationals in Horticulture

Extended Certificate in Horticulture

Foundation Diploma in Horticulture

Diploma in Horticulture

Extended Diploma in Horticulture

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Registered Office: 80 Strand, London WC2R 0RL
VAT Reg No GB 278 537121

ISBN 978-1-4469-4670-1