BTEC

BTEC Level 2 Technical Diploma in HORTICULTURE

SPECIFICATION

First teaching: September 2018 | First certification: Summer 2019

ISSUE 3

Pearson

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Edexcel, BTEC and LCCI qualifications

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This specification is Issue 3. Key changes are listed in the summary table on the page after next of the document. We will inform centres of any changes to this issue. The latest issue can be found on the Pearson website: qualifications.pearson.com

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Welcome

With a track record built over 30 years of learner success, BTEC qualifications are widely recognised and respected. They provide progression to the workplace, either directly or via study at higher levels. Proof comes from YouGov research, which shows that 62% of large companies have recruited employees with BTEC qualifications.

Why are BTECs so successful?

BTECs embody a fundamentally learner-centred approach to the curriculum, with a flexible, unit-based structure. In these new BTEC Level 2 Technicals, the focus is on the development of technical, practical and transferable work-related skills, and sector-specific knowledge. The development of these skills is key for learners to progress to work or to an Apprenticeship.

When creating the BTEC Level 2 Technicals, we worked with employers to ensure that the qualifications meet their needs. Employers are looking for recruits with the appropriate technical knowledge, and technical and transferable skills essential for employment.

The BTEC Level 2 Technicals meet these requirements through:

- a range of occupationally-related qualifications, each with a clear purpose, so that there is a qualification to suit each learner's plan for career progression
- up-to-date content that is closely aligned with employers' needs for a skilled future workforce
- assessments chosen to help learners progress to the next stage. This means that all assessments are set by the centre to meet local needs. This ensures that there is a core of skills and understanding common to all learners.

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

A word to learners...

BTEC Level 2 Technicals will demand a lot of practical work from you. You will need to:

- complete a range of units
- be organised
- take some assessments that Pearson will set and mark
- take other assessments that will demonstrate your technical and practical skills
- 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 go on to work or to an Apprenticeship – success in your BTEC Level 2 Technical qualification will help you to progress to the next stage in your life.

Good luck, and we hope you enjoy your course.

Collaborative development

Learners completing their BTEC Level 2 Technicals will be aiming to go on to employment or to an Apprenticeship. It was essential, therefore, that we developed these qualifications in close collaboration with experts from professional bodies and businesses, and with the providers who will be delivering the qualifications. We are grateful to all the further education lecturers, tutors, employers, professional body representatives and other individuals who have generously shared their time and expertise to help us develop these new qualifications.

Employers, professional bodies and further education providers that have worked with us include:

- The Institute of Groundsmanship (IOG)
- Oak View Landscapes.

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

Summary of Pearson BTEC Level 2 Technical Diploma in Horticulture specification Issue 3 changes

Summary of changes made between the previous issue and this current issue	**Page number**
Unit 1: Introduction to Working in Land-based Industries and *Unit 2: Introduction to Plant and Soil Science* have been changed from being externally-assessed to being internally-assessed.	Pages 13-39
The wording in *Section 7 Teacher/centre malpractice* has been updated to clarify suspension of certification in certain circumstances.	Pages 158, 159
The wording under *Section 9 Understanding the qualification grade* has been updated to clarify current practice in ensuring maintenance and consistency of qualification standards.	Page 163

Summary of Pearson BTEC Level 2 Technical Diploma in Horticulture specification Issue 2 changes

Summary of changes made to Issue 2	**Page number**
The grades earned in Examples 1 and 2 have been amended.	Pages 163 and 164

Contents

Pearson BTEC Level 2 Technicals

Introduction

BTEC Level 2 Technicals are intermediate qualifications for post-16 learners who want to specialise in a specific occupation, occupational area or technical role. They prepare learners for work or an Apprenticeship by giving them the opportunity to develop sector-specific knowledge, technical and practical skills, and to apply these skills in work-related environments. The qualifications also provide progression to Level 3 Tech Level qualifications.

Developed in close conjunction with leading employers, BTEC Level 2 Technicals develop transferable workplace skills, such as good communication and the ability to work in a team, which employers have identified as essential for gaining employment in the sector and for progression once the learner is working.

At the core of these qualifications is the concept of preparing young people for the working world. Through practical activities and occupationally-fit-for-purpose assessments, learners will gain the skills and behaviours needed for sustainable employment.

BTEC Level 2 Technicals are designed to be used flexibly, depending on their size and scope:

- as part of a full-time 16–19 study programme, alongside mathematics and English GCSEs and/or Functional Skills, work placement and enrichment activities
- as the technical qualification within an Apprenticeship or off-the-job training for those already in work
- as a roll-on, roll-off programme for those entering an Apprenticeship or employment.

These qualifications are not eligible for performance tables in England.

This specification contains the information you need to deliver the Pearson BTEC Level 2 Technical Diploma in Horticulture (603/1908/2). The specification signposts you to additional handbooks and policies. It includes all the units for this qualification.

1 Pearson BTEC Level 2 Technical Diploma in Horticulture

Purpose

Who is the qualification for?

This qualification is for you if you want to start a career in horticulture. It is designed for post-16 learners and can be taken as part of a wider study programme. It is an ideal qualification if you are intending to progress directly to employment within horticulture, or to a horticulture Apprenticeship.

What does the qualification cover?

This qualification has been developed in consultation with employers in the horticulture sector to ensure that you develop the skills and behaviours that will give you the best opportunity to be successful when applying for work.

There are five mandatory units that relate directly to the skills, knowledge and behaviours expected by employers in the horticulture sector. The areas you will cover include:

- health and safety
- an introduction to plant and soil science
- a horticulture work placement
- land-based machine operations
- estate maintenance.

You will be able to add three optional units to the mandatory content, covering areas such as:

- establishing and maintaining plants and seeds
- maintaining sports and amenity turfs
- maintaining soft landscapes
- construction and maintenance of hard landscapes
- nursery stock production
- propagation techniques.

You will also enhance your broader skills in literacy and numeracy, which will be invaluable in supporting progression in other areas. In addition, you will develop transferable technical and practical skills in communication (working with colleagues, customers and clients), and research and project work (giving you an opportunity to demonstrate your reflective practice by suggesting alternative approaches to a problem).

What could this qualification lead to?

When studied as part of a full study programme, typically alongside maths or English, this qualification will give you an advantage when applying for a job in horticulture. The types of role you will be supported to progress to include:

- plant area assistant
- assistant groundsperson
- horticultural worker
- trainee gardener
- trainee landscape operative
- trainee ground maintenance operative.

This qualification will also give you a sound basis to progress further in the horticulture sector to a Level 3 qualification, such as the Pearson BTEC Level 3 National Diploma in Horticulture.

About the horticulture sector

There are currently more than 235,500 people working in the horticulture sector spread across the UK, and it is expected that between now and 2020 the industry will need around 120,000 new entrants. Horticulture is a diverse industry, offering a wide range of progression and job opportunities, which can vary from greenkeeper to gardener, landscaper and sports turf management. Horticulture includes the production of plants, fruits and vegetables, sold either to be eaten or as ornamental plants for gardening.

2 Structure

Total Qualification Time (TQT)

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 tutors and assessors in teaching, supervising and invigilating learners.

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

The Pearson BTEC Level 2 Diploma in Horticulture is a qualification that has:

- Total Qualification Time: 616 hours
- Guided Learning: 360 hours.

Centres should take note of these hours when planning their programme but should also use their professional judgement to determine the provision of guided learning and study time across the units.

Qualification structure

Learners are required to complete and achieve all mandatory units and three optional units in the qualification.

Pearson BTEC Level 2 Technical Diploma in Horticulture				
Unit number	**Unit title**	**GLH**	**Type**	**How assessed**
1	Introduction to Working in Land-based Industries	**60**	Mandatory	Internal
2	Introduction to Plant and Soil Science	**60**	Mandatory	Internal
3	Horticulture Work Placement	**60**	Mandatory	Internal
4	Land-based Machinery Operations	**30**	Mandatory	Internal
5	Propagation Techniques	**30**	Optional	Internal
6	Establish and Maintain Plants and Seeds	**30**	Optional	Internal
7	Nursery Stock Production	**30**	Optional	Internal
8	Maintain Sports and Amenity Turf	**30**	Optional	Internal
9	Establish and Maintain Soft Landscapes	**30**	Optional	Internal
10	Construction and Maintenance of Hard Landscapes	**30**	Optional	Internal
11	Estate Maintenance in Horticulture	**60**	Mandatory	Internal Synoptic

This qualification has 83.3% mandatory content and 16.66% optional content.

These qualifications are not eligible for performance tables in England.

Qualification and unit content

Pearson has developed the content of this qualification in collaboration with employers and representatives from relevant professional bodies and further education providers. In this way, we have ensured that content is up to date and that it includes the knowledge, technical and practical skills and behaviours required to work in the sector and occupational area.

75% of the content in this qualification is mandatory, which provides a balance of breadth and depth, ensuring that all learners develop the technical and practical skills required in the occupational area. Learners are then given the opportunity to develop a range of transferable skills and attributes expected by employers. It is expected that learners will apply their learning to relevant employment and sector contexts during delivery, and that they will have opportunities to engage meaningfully with employers.

BTECs 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 practical, work-related tasks that encourage the development of appropriate work-related behaviours (the affective domain) and transferable skills. Transferable skills are those such as communication, teamwork, planning and completing tasks to a high standard, all of which are valued in the workplace.

Our approach provides rigour and balance and promotes the ability to apply learning immediately in new contexts.

Some of the units in this 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 designed to fit the purpose and objective of the qualification. It includes a range of assessment types and styles suited to skills and occupationally-based qualifications at this level.

Internal assessment

Units 1, 2, 3, 4, 5, 6, 7, 8, 9, 10 and 11 are assessed through internal assessment. Internal assessment allows learners to apply technical knowledge and demonstrate mastery of practical and technical skills through realistic tasks and activities. This style of assessment promotes deep learning through ensuring the connection between knowledge and practice.

Internal assessment is through assignments that are subject to external standards verification. We provide suggestions in each unit for setting assignments. This means that you can adapt materials to your local contexts and assess assignments that provide the valid and rigorous final assessment for each unit.

You will make grading decisions based on the requirements and supporting guidance given in the units. Learners must achieve all the internally-assessed units at Pass grade or above to achieve the qualification. For further information on internal assessment, including resubmissions, see *Section 6 Internal assessment*.

Internal synoptic assessment

There is one internally-assessed unit that provides the main synoptic assessment for this qualification. This synoptic assessment is designed to take place towards the end of the programme and draws on the learning throughout. The design of this assessment ensures that there is sufficient stretch and challenge, enabling the assessment of sector-related knowledge and technical and practical skills at the end of the learning period.

The synoptic assessment for this qualification is based on *Unit 11: Estate Maintenance in Horticulture*. It takes the form of a vocational activity in which learners are required to inspect, report and carry out repairs, maintenance and installation of boundaries, surfaces and structures. In completing this synoptic assessment/activity, learners will select and use knowledge and skills of key land-based working practices and essential plant and soil science acquired from: *Unit 1: Introduction to Working in Land-based Industries* and *Unit 2: Introduction to Plant and Soil Science*. Sector-specific practical skills developed in *Unit 9: Establish and Maintain Soft Landscapes*, *Unit 10: Construction and Maintenance of Hard Landscapes* and *Unit 4: Land-based Machinery Operations* will allow learners to respond to the estate needs, ensuring the maintenance of plants by applying the practical skills developed through their learning from units such as: *Unit 6: Establish and Maintain Plants and Seeds* and *Unit 8: Maintain Sports and Amenity Turf.* Learners' completion of real-life work, as required by *Unit 3: Horticulture Work Placement*, means that they will use the experience and understanding of working in and around an estate environment.

In delivering *Unit 11: Estate Maintenance in Horticulture*, you need to encourage learners to draw on their broader learning so that they are prepared for the assessment.

Language of assessment

Assessment of the internally-assessed units for this qualification will be available in English. All learner work must be in English. A learner taking the qualification may be assessed in British Sign Language where it is permitted for the purpose of reasonable adjustment. For information on reasonable adjustments see *Section 7 Administrative arrangements*.

Grading of the qualification

Achievement in the qualification requires a demonstration of depth of study in each unit, assured acquisition of the practical skills required for employment in the specific sector and successful development of transferable skills.

Units are assessed using a grading scale of Distinction, Merit, Pass and Unclassified. All units in the qualification contribute proportionately to the overall qualification grade.

The qualification is graded using a scale of PP to DD. Please see *Section 9 Understanding the qualification grade* 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.

Employer involvement

Employer involvement in the delivery and/or assessment of technical qualifications provides a clear 'line of sight' to work, enriches learning, raises the credibility of the qualification in the eyes of employers, parents and learners, and furthers collaboration between the learning and skills sector and industry.

You need to ensure that all learners have the opportunity to undertake meaningful activity involving employers during their course.

Examples of 'meaningful activity' include:

- structured work experience or work placements that develop skills and knowledge relevant to the qualification/industry
- project(s), exercise(s) and/or assessment(s)/examination(s) set with input from industry practitioner(s)
- units delivered or co-delivered by an industry practitioner(s); this could take the form of masterclasses or guest lectures
- industry practitioners operating as 'expert witnesses' who contribute to the assessment of a learner's work practice, operating within a specified assessment framework; this may be a specific project(s), exercise(s) or all assessments for a qualification.

Meaningful employer involvement, as defined above, must be with employers from the land-based sector and should contribute significantly to at least one mandatory unit.

For this qualification, the following unit has specified mandatory requirements for employer involvement in delivery and/or assessment:

- Unit 3: Horticulture Work Placement.

The assessment for this unit must take place in a real work environment. Learners must have a work placement to facilitate this assessment. Please see the unit for information on the requirements for work placement.

In some units we have also given suggestions as to how employers could become involved in the delivery and/or assessment of this qualification. These units are listed below:

- Unit 4: Land-based Machinery Operations
- Unit 5: Propagation Techniques
- Unit 6: Establish and Maintain Plants and Seeds
- Unit 7: Nursery Stock Production
- Unit 8: Maintain Sports and Amenity Turf
- Unit 11: Estate Maintenance in Horticulture.

These are suggestions only and there will be other possibilities at local level. Centres may choose to use other approaches but must ensure that they meet the requirement for meaningful employer involvement as defined above. Centres must have an employer involvement plan in place at the start of the programme. It must detail their approach to employer involvement and how it will add value to the delivery and assessment of the qualification.

Each centre's approach to employer involvement will be monitored in two ways. It will be monitored at centre level as part of the annual quality-management review process and captured as part of the standards verification 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 also be monitored 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 that additional activities can be scheduled where necessary so that learners are not disadvantaged, see *Section 8 Quality assurance*.

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 internal unit in the specification is set out in a similar way.

This section explains how the units work. It is important that all tutors, assessors, internal verifiers and other staff responsible for the programme read and are familiar with the information given in this section.

Internally-assessed units

Section	Explanation
Unit number	The number is in a sequence for the qualification.
Unit title	This is the formal title of the unit and appears on certificates.
Level	All units are at Level 2 on the national framework.
Unit type	This says if the unit is mandatory or optional for the qualification. See *Section 2 Qualification structure* for details.
Assessment type	This says how the unit is assessed – i.e. whether it is internal or synoptic internal. See *Section 2 Qualification structure* for details.
GLH	Units have a GLH value of 60 or 30. This indicates the number 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 developing and demonstrating their skills or where they should be actively researching or reviewing.
Unit summary	This section helps tutors to see at a glance the main content areas against the learning aims and the structure of the assessment. 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 of content for the unit or learning aim(s) has been covered.

Section	Explanation
Assessment criteria	Each learning aim has assessment criteria to explain the achievement required to obtain Pass, Merit and Distinction grades.
Essential information for assessment decisions	This information gives guidance for each learning aim or assignment on the expectations for Pass, Merit and Distinction standard. This section contains examples and essential clarification. It is important that this is used carefully alongside the assessment criteria.
Assessment activity	This section provides information, suggested scenarios and tasks for summative assessment activities.
Further information for tutors and assessors	This section gives you information to support the delivery and assessment of the unit.
Delivery guidance	This section offers suggestions of ways of delivering the unit. It offers ideas on practical activities in a sector context that can be used to help develop relevant skills and to encourage progress.
Essential 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 Resources and support*.
Links to other units	This section shows you the main relationships of units to other units. This can help you to structure your programme and make the best use of available materials and resources.
Employer involvement	This section gives you information on the units that can be used to involve learners with employers. This information will help you to identify the kind of involvement that is likely to be successful.

Units

This section contains all the units developed for this qualification.

Unit 1: Introduction to Working in Land-based Industries

Level: **2**

Unit type: **Mandatory**

Assessment type: **Internal**

Guided learning hours: **60**

Unit in brief

In this unit, learners will develop their knowledge and understanding of factors that influence working practices within land-based industries.

Unit introduction

In this unit, you will learn about key job roles in land-based industries and the exciting activities these include. You will consider how laws and other important guidance ensure that working in land-based industries is safe and puts workers' needs first. You will look at how land-based industries can diversify by offering new products and services to the public and different ways in which land-based industries can increase their sustainability by reducing the impacts they have on the environment.

In this unit, you will learn about the professional behaviour and conduct to use when working in land-based industries and the health and safety legislation that affects the way we work within the land-based industries. In order to work at an operational level within these industries, it is essential you have the knowledge and understanding to apply safe and professional working to different situations.

The land-based industries are based on traditional occupations and in order to succeed in this area you need to be able diversify to utilise opportunities, while also being considerate to the environment. You will learn about diversification and sustainability to give you the knowledge and understanding required for this and to enable you to work responsibly to protect the environment.

Learning aims

A Investigate working in the land-based sector

B Carry out safe working in the land-based sector

C Demonstrate responsible environmental working practices.

Unit summary

Learning aim	Key teaching areas	Summary of suggested assessment evidence
A Investigate working in the land-based sector	**A1** Land use **A2** Diversification in land-based Industries **A3** Key job roles by industry	A written report including case studies Photographic/video evidence of learners carrying out land-based tasks in a safe and environmentally responsible manner, supported by observation records. Learners will also need to include reflections on safe and environmentally responsible working practices.
B Carry out safe working in the land-based sector	**B1** Fundamentals of working safely **B2** Working safely	
C Demonstrate responsible environmental working practices	**C1** Waste Management **C2** Sustainability **C3** Environmental responsibilities	

Key teaching areas in this unit include:

Sector skills	Knowledge	Transferable skills/behaviours
• Identification of land use types • Correct selection and use of tools, equipment, materials and PPE to ensure safe working	• Health and Safety legislation • Waste management legislation and codes of practice	• Developing practical and technical skills • Working with others • Problem solving • Self-management and development

Unit content

Knowledge and sector skills

Learning aim A: Investigate working in the land-based sector

A1 Land use

Understand the features and characteristics that influence land use.

- Land-based industries including: agriculture, horticulture, forestry and arboriculture, water supply, mineral extraction.
- The social, ecological and aesthetic use and values of the landscape, including:
  - managing landscapes
  - maintaining countryside character
  - preserving and protecting rural landscapes
  - reducing pollution
  - protecting wildlife
  - reducing flood risk
  - recreation, transport.

A2 Diversification in land-based industries

Purposes, advantages and disadvantages of diversification.

- Opportunities for land-based businesses:
  - sport and leisure, e.g. mountain biking, walking, hiking, climbing, paintballing, off-road vehicles, water sports, angling, golf, shooting, canine and equine activities
  - tourism, e.g. country houses and gardens, camping/glamping, farm parks, retail and food, tea shops, gift shops
  - energy production, e.g. biofuel, wind and solar farms
  - education, e.g. school activity holidays/centres, rural crafts, environmental awareness and
  - conservation strategies.
- Implementation of diversification:
  - planning considerations, e.g. access, impact on local services, aesthetic/environmental impacts
  - sources of funding, e.g. government schemes, commercial partnerships, private investment, charitable grants.

A3 Key job roles by industry

- Understanding the skills, qualifications, key responsibilities required, and career pathways and progression for different types of jobs, within the relevant land-based industry.
  - Agriculture, e.g. stock/herdsperson, farm worker, crop technician, machinery operator
  - Countryside, e.g. park ranger, education officer, estates officer, game keeper, water bailiff
  - Horticulture, e.g. greenkeeper, grounds person, nursery worker, garden centre assistant, gardener, landscaper
  - Forestry and Arboriculture, e.g. arborist, tree surgeon, ground maintenance operative, plant operator, forest craftsman.

Learning aim B: Carry out safe working in the land-based sector

B1 Fundamentals of working safely

Understand the essential principles of safe working in land-based environments and the extent to which care can be given in emergency scenarios.

- Working safely with machines, chemicals, livestock and equipment:
  - following policies and procedures
  - promoting safe working and healthy conditions
  - assessing risks
  - undertaking safety training.
- Appropriate actions, reporting procedures and legal responsibilities for accident and emergency situations:
  - lines of reporting (supervisor, manager, healthcare professional, emergency services)
  - common accident scenarios and their responses e.g. shock, cuts, bleeding, fracture, burns, poisoning, stings/bites, road traffic accident, severe allergies, tourniquets, splinting, large wounds)
  - initial and follow-up responses to chemical spills or ingestion, fire, disease outbreak, escape of livestock.
- Basic first-aid principles:
  - aims of first aid and how to apply it in different situations e.g. prevent further harm, relieve pain, promote recovery, protect the unconscious
  - legal limitations and implications of first aid
  - key contents of first-aid box e.g. bandages, dressings, surgical tape, cotton wool, towel, scissors, disposable gloves, tweezers; personal first-aid kit with large wound dressing.

B2 Working safely

Procedures and requirements for working safely while carrying out tasks, including relevant responsibilities of employers and employees when working in land-based industries.

- Responsibilities of employers and employees for maintaining health and safety including the role of the Health and Safety Executive.
- Current relevant legislation and codes of practice.
- Using risk assessments.
- Dynamic risk assessment while working.
- Additional risks associated working in the land-based sectors to include:
  - lone working
  - working near water
  - working with animals; animal health and their transport
  - slurry pits
  - farm machinery.
- Purpose, selection, pre-use checks and use of personal protective equipment (PPE) according to task including:
  - eye/face e.g. goggles, safety glasses, visor, full face shield
  - head e.g. full face shield, hard hat
  - ear protection e.g. earplugs, earmuffs
  - hand protection e.g. padded gloves, rubber gloves, heavy duty gloves, chainsaw gloves
  - protective clothing e.g. overalls, reflective safety clothing, chainsaw trousers, chemical resistant coveralls/aprons)

- protective footwear e.g. latex/rubber footwear, steel toe-capped boots, chainsaw boots
- respiratory protection, dust masks
- working at height safety equipment e.g. harnesses and ropes.

- Health and safety signs and symbols relevant to the UK including the UK Health and Safety Executive, International Organization for Standardization (ISO):
  - mandatory e.g. wear protective footwear, protective clothing, eye protection, hand protection, ear protection, head protection, face mask, respirator
  - prohibition e.g. no admittance to unauthorised personnel, not drinking water, do not run, do not enter, no naked flames
  - safe condition e.g. first aid, fire exit, emergency shower, emergency eye wash, emergency stop, disabled refuge point, assembly point
  - fire equipment e.g. fire alarm, fire hydrant, fire hose reel, fire extinguisher
  - warning e.g. general warning, electricity, hot surface.

Learning aim C: Demonstrate responsible environmental working practices

C1 Waste management

The main features, purpose and legislative requirements of waste management including:

- Principles of managing waste and the waste hierarchy and pyramid of recycling, including: disposal, energy from waste, 3 Rs – Reduce, Reuse, Recycle.
- Categories of controlled waste, including solid waste, liquid waste and hazardous waste e.g. asbestos, chemicals, batteries, solvents, pesticides, oils, clinical.
- Methods of dealing with different types of waste, for example use of colour coding or other methods of segregating.
- Recycling opportunities and activities:
  - composting of organic materials
  - irrigating using grey water
  - recycling of used plastic in the industry e.g. bale wrap, crop cover.
- UK Health and Safety Executive hazard pictograms relevant to waste management:
  - toxic material, oxidising material, hazardous to the environment, flammable materials, corrosive, irritant, explosive material, slippery surface.
- Current legislation regarding waste management e.g. use of waste management hierarchy, consideration of waste management options, declaration that waste management hierarchy has been considered including versions by UK country.
- Documents associated with waste management and disposal documents e.g. Duty of Care: Waste Transfer Notes, Hazardous Waste Consignment note, waste exemptions.
- Areas that require special care: Nitrate Vulnerable Zones (NVZs), groundwater Source Protection Zones (SPZs).

C2 Sustainability

Key principles of sustainability, benefits and disadvantages of utilising sustainable practices in land-based businesses.

- The 3 Ps of sustainability: people, planet, profit.
- Understanding 'carbon footprint' and carbon footprint assessment to:
  - reduce fuel consumption
  - conserve energy resources
  - facilitate carbon sequestration.
- Calculate basic carbon footprint/sequestration.

- Financial, environmental, health and political benefits and disadvantages to adopting sustainable practices.
- Activities and practices that may increase sustainability and/or reduce reliance on natural resources:
  - solar and wind farms
  - production of biofuels
  - short rotation coppice, soil management
  - production forecasting and sustainable yield management in forestry
  - reductions and efficiencies in water, energy use, oil and fossil fuel use
  - organic farming.

C3 Environmental responsibilities

Potential and probable impacts of land use, land-based practices and mitigating actions to protect the environment.

- Intensive farming systems and responsible use of medications and chemicals.
- Forestry including use of exotic species, monoculture.
- Urban and transport network development, use of land for recreation.
- Causes and consequences of loss, fragmentation or removal of habitats:
  - boundary removal
  - introduction and spread of non-native invasive plant and animal species
  - food production
  - reduced biodiversity
  - wetland drainage.
- Advantages and disadvantages of adopting environmentally responsible practices.
- Use of Environmental Impact Assessments.

Transferable skills

Developing practical and technical skills

- Demonstrate techniques/skills/processes.
- Use equipment safely and appropriately.

Self-management and development

- Working in a professional environment.
- Planning own time.
- Reviewing own progress.
- Working under pressure to meet professional deadlines.
- Thinking skills/adaptability.

Working with others

- Listening and working as a team.

Problem solving

- Carrying out practical tasks.
- Identifying and choosing the right equipment.

Assessment criteria

Pass	Merit`	Distinction
Learning aim A: Investigate working in the land-based sector		
A.P1 Identify land use in a given context.	**A.M1** Describe factors affecting land use and job roles in a given context.	**A.D1** Evaluate land use and job roles in a given context.
A.P2 List job roles in land use in a given context.		
Learning aim B: Carry out safe working in the land-based sector		
B.P3 Carry out safe working practices when carrying out work in a land-based environment.	**B.M2** Carry out and explain the reasons for safe working practices in a land-based environment.	**B.D2** Carry out and assess the importance of safe working practices in a land-based environment.
Learning aim C: Demonstrate responsible environmental working practices		
C.P4 Carry out waste management practices to demonstrate some environmental awareness.	**C.M3** Demonstrate and explain the reasons for environmentally responsible and sustainable working practices.	**C.D3** Demonstrate and assess the importance of responsible environmental working practices on the environment.
C.P5 Outline sustainable and environmentallty responsible working practices.		

Essential information for assessment decisions

Learning aim A

For distinction standard, learners will:

- use findings and own observation to comprehensively report on the features, characteristics and values, of different land uses and connected job roles within their chosen sector. Learners will cover a minimum of three specific land uses. They will include informed references to diversification fora minimum of three land-based industries in their chosen sector, citing advantages and disadvantages for each. They will justify the relationships between these land uses, related job roles and associated diversified activities by providing sound reasons and further possibilities for diversification in the land-based industries they are covering.

For merit standard, learners will:

- use findings and own observations to describe the features, characteristics and values, of different land uses and connected job roles within their chosen sector. They will cover a minimum of three specific land uses. Learners will include some references to diversification in a minimum of three land-based industries in their chosen sector. Learners will give some reasons for the relationships between these land uses, related job roles and associated activities.

For pass standard, learners will:

- use findings, own observations and research and provide a summary of the features, characteristics and values, of a minimum of three different land uses including for each an example of one appropriate job and one example of diversification within their chosen sector.

Learning aims B

For distinction standard, learners will:

- carry out three specified tasks safely, fully adhering to relevant safety legislation and procedures. They consistently ensure the health and safety of self and others. They routinely assess the risks before and while they are carrying out the work. They consistently check and use relevant personal protective equipment as the work requires. They determine the importance of safe working practices by justifying why they worked in this way and what would happen with non-adherence to safety.

For merit standard, learners will:

- carry out three specified tasks safely, adhering to relevant legislation and procedures, most of the time. They work in a safe manner to ensure safety of self and others most of the time. They check and use relevant personal protective equipment most of the time. They give reasons for safe working practices.

For pass standard, learners will:

- carry out three specified tasks They work in a safe manner to ensure safety of self and others but may need prompting in order to do so. They use Personal protective equipment but may need prompting in selecting the relevant equipment.

Learning aims C

For distinction standard, learners will:

- adopt consistent, sustainable and environmentally responsible working practices. They always, dispose of waste safely and correctly, fully abiding to the principles, waste hierarchy and pyramid of recycling of waste management. They show full awareness of environmental responsibility while working, by taking mitigating actions to protect the environment. They determine the importance of environmental responsibility by justifying why they have worked in a certain way as well as the disadvantages to the environment should they not.

For merit standard, learners will:

- adopt sustainable and environmentally responsible working practices. They dispose of waste safely by abiding by the principles, waste hierarchy and pyramid of recycling of waste management most of the time. They show awareness of environmental responsibility most of the time, while working, by taking some actions to protect the environment. They determine the importance of environmental responsibility by justifying why they have worked in a certain way.

For pass standard, learners will:

- carry out the three tasks showing some concern for the sustainability and awareness for the environment. They dispose of waste showing some awareness of the principles, waste hierarchy and pyramid of recycling of waste management. They outline a minimum of three environmental working practices which may not be related to their tasks.

Assessment activity

The summative assessment activity takes place after learners have completed their formative development. The activity should be practical, be set in a realistic scenario and draw on learning from the unit, including the transferable skills. You will need to give learners a set period of time and number of hours in which to complete the activity. *Section 6* gives information on setting assignments and there is further information on our website.

A suggested structure for summative assessment is shown in the *Unit summary* section, along with suitable forms of evidence. This is for illustrative purposes only and can therefore be adapted to meet local needs or to assess across units where suitable opportunities exist. The information in the *Links to other units* section will be helpful in identifying opportunities for assessment across units.

The following scenario could be used produce the required evidence for this unit. Centres are free to use comparable scenarios or other forms of evidence provided that it meets the assessment requirements of the unit.

Suggested scenario

You are working in a land-based sector and have been asked to identify what the land usage and related jobs are and how this can be diversified for the land to be used more profitably. You have also be asked to carry out three tasks which you need to ensure you do safely. You need to ensure that you consider sustainable and environmental practices while carrying out your work.

If a retake is necessary, an alternative example must be used. The following is an example of a retake assessment activity.

Three different tasks within the land-based sector must be used.

Further information for tutors and assessors

Delivery guidance

The following are examples of practical activities and workshops that tutors could use when developing sector and transferable skills in the delivery of this unit. Wherever possible, practical activities should be used to help learners develop both personal and sector skills in preparation for the final assessment. These suggestions are not intended as a definitive guide to cover the full GLH of the unit.

Introduction to unit

Tutor introduces the main concepts contained within the unit through a series of presentations, class-based activities and practical work. Case studies should be used and visits or field work could be considered.

The main concepts to be covered are:

- Types of land use. Using photographs, land use maps and field work, learners explore the range of land use and their characteristics.
- The 'value' of landscapes, for example, social, economic, recreational.
- Job roles. Learners consider the job roles associated with types of land use. The job roles may be specific, for example, farm manager, countryside warden or general, for example, animal transport driver, agricultural surveyor. Learners would benefit from guest speakers in this respect.
- Diversification. Learners should consider how land use changes and the factors that influence this change. Diversification in response to economic, social and environmental factors should be considered.
- Sustainability and environmentally responsible practice. Learners should understand the need for promoting and adopting working practice and waste management strategies that are both sustainable and environmentally sound. Reference to global issues, for example, climate change, and local issue, for example, river pollution or flood alleviation, should be made.
- The need for learners to work safely – all the time - is essential and tutors must emphasise that this encompasses a wide range of responsibilities to self, other people, animals and the environment.

Suggested time: about 8 hours.

Activity: Exploring land use

Learners should use maps, research, visits and personal experience to investigate three specific land uses. The land chosen should reflect the learner's own interest and sector, (for example, forestry, horticulture, arboriculture, countryside management). At least one of the land uses chosen should reference diversification. Examples of land use might include:

- Mixed lowland farm
- Forest Park
- Upland sheep farm.

For each land use, learners should provide a case study that explores the characteristics of the land use, the job roles specifically associated with the land use, and examples of sustainable and environmentally responsible practice. For diversification learners could examine specific examples, for the actual use of farm buildings for holiday lets or the potential for diversification.

Suggested time: about 8 hours.

Activity: Working Safely

Learners should be introduced to the need to work safely. Case studies could be used to illustrate the consequences of unsafe working and the high occurrence of incidents in the land-based industries.

The legal framework needs to be examined using examples of sector relevant current legislation together with the need to understand employer and employee responsibilities.

Learners should understand the purpose and use of prepared risk assessments and the need to monitor safe working while undertaking tasks (dynamic risk assessment). Tutors should also consider creating scenarios where immediate first aid is required. These can be reinforced while undertaking practical tasks.

Suggested time: about 8 hours.

Activity: Working with Waste

Learners should, through classroom-based instruction and practical tasks, become familiar with current licensing/regulations relating to waste disposal and that they can undertake practical waste disposal that is fully compliant.

Suggested time: about 8 hours.

Activity: Working Sustainably

Through classroom instruction and practical tasks, learners should understand the need to manage resources and the advantages and disadvantages of adopting sustainable working practices.

Learners should explore, at a variety of scales, methods and technologies that reduce the reliance on natural resources. Examples to illustrate this could include, large offshore wind farms, short rotation coppicing, conversion of methane to bio fuels.

Learners should undertake basic carbon footprint calculations, sequestration potentials

Suggested time: about 8 hours.

Activity: Working Responsibly

Through classroom instruction and practical tasks, learners should understand the need to manage the environment responsibly. Learners could investigate sector specific threats and the measures taken to mitigate environmental loss or damage, developing case studies to illustrate.

Learners should explore specific working practices that promote good environmental husbandry, for example:

- Scrub clearance to remove invasive plant species.
- Creation of flood alleviation dams on upland streams.
- Use of GIS (Geographic Information Systems) to target chemical applications on crops.

Suggested time: about 8 hours.

Activity: Practical Activities and Assessment

Tutors should ensure that learners undertake relevant, sector specific practical tasks to demonstrate they can:

- Work safely.
- Manage waste correctly.
- Adopt sustainable practices.
- Maintain good environmental standards.

Tutors could consider other areas of the programme that provide suitable learning and assessment opportunities, for example, work experience, practical units running concurrently.

Suggested time: about 14 hours.

Essential resources

For this unit, learners will need access to

- Suitable tools, materials and equipment to carry out practical tasks.

Links to other units

This unit draws on the knowledge and skills taught in:

- Unit 3: Countryside Work Placement
- Unit 4: Habitat Maintenance
- Unit 5: Countryside Access and Recreation
- Unit 6: Introduction to Game Management
- Unit 7: Land-based Machinery Operations
- Unit 8: Countryside Estate Maintenance.

Employer involvement

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

- guest speakers
- design/ideas to contribute to unit assignment/case study/project materials
- work experience
- own business materials as exemplars
- support from local business staff as mentors.

Unit 2: Introduction to Plant and Soil Science

Level: **2**

Unit type: **Mandatory**

Assessment type: **Internal**

Guided learning hours: **60**

Unit in brief

Learners develop skills and knowledge to understand the importance of plant and soil science when working in land-based sectors.

Unit introduction

Plants really are amazing; they supply the oxygen we breathe, provide us with food and resources and enhance our beautiful landscapes over many years. Having a clear understanding of how plants grow, what they need to stay healthy and the role soil plays in their success is essential when working in any of the land-based sectors.

In this unit, you will learn just how amazing plants are and what they need to survive. You will explore internal structures of plants from cells to transport systems and external plant structures including stems, roots, leaves and flowers, looking at their functions and characteristics. You will also investigate soil types, texture, structure, pH, nutrients and care.

Whether you decide to gain employment in agriculture, horticulture, countryside, forestry and arboriculture or continue your study on to a level three qualification, understanding plant processes and soil requirements will be a huge advantage to your next steps.

Learning aims

A Investigate plant structure, growth and development

B Investigate plant life cycles and adaptations to the environment

C Investigate soil characteristics and effects on plant health.

Unit summary

Learning aim	Key teaching areas	Summary of suggested assessment evidence
A Investigate plant structure, growth and development	**A1** Plant structure **A2** Plant processes	The learners will build a portfolio of evidence from working with given plant species and soil from a specified area, supplemented by practical laboratory work and/or producing models of cell structure.
B Investigate plant life cycles and adaptations to the environment	**B1** Plant growth and development **B2** Plant adaptations and modifications	
C Investigate soil characteristics and effects on plant health	**C1** Soil characteristics **C2** Soil textures and structure of cells **C3** Soil water, PH and nutrients **C4** Soil care	

Key teaching areas in this unit include:

Sector skills	Knowledge	Transferable skills/behaviours
• Soil and plant testing • Experiment skills • Machinery and tool operation • Health and safety	• Reliability of data recorded • Plant structures and functions • Soil types, texture and structure	• Communication • Working with others • Thinking skills/adaptability • Problem solving • Management of information • Self-management and development

Unit content

Knowledge and sector skills

- Working safely – operating machinery and tools with due regard for safety of self and others.

Learning aim A: Investigate plant structure, growth and development

A1 Plant structures

Features of the plant and their location within the plant structure to develop understanding of how plants grow and develop and how the growth patterns can then be manipulated. Internal and external parts of plants, where they can be found, and their functions.

- Cell structures, key features of plant cells and identification of organelles:
  - cell wall, cell membrane, nucleus, vacuole, cytoplasm, mitochondria, chloroplasts
  - reproduction of cells, cell division, process of mitosis and meiosis and where these take place.
- Internal parts of plants, location, functions and characteristics:
  - xylem
  - phloem
  - cambium
  - experiments to determine the role of the vascular bundle.
- External parts of plants, characteristics, function and component parts:
  - roots e.g. root cap, root hairs, primary root, lateral roots, intake of water and minerals, anchorage
  - shoots: tropisms, e.g. geotropism, phototropism
  - stems: structure, growth, strength, nodes, leaf buds
  - leaves: simple, compound, needles, scales, lamina, stoma, guard cells, veins, petiole
  - flowers: types, including: angiosperms, gymnosperms; pollination methods, e.g. wind pollinated, insect pollinated, water pollinated; inflorescence types, e.g. petals, tepals, sepals, male organs: microstrobili, stamen, anther and filament, female organs: ovary, stigma, style, macrostrobili.

A2 Plant processes

Plant processes, the factors that affect and influence their rates, and how each of these affect plant growth and development.

- Photosynthesis:
  - equation for process, (CO_2 to produce glucose and oxygen)
  - how plant canopies optimise the interception of sunlight
  - required factors e.g. water, carbon dioxide and light
  - limiting factors, e.g. light intensity, carbon dioxide concentration and temperature.
- Respiration:
  - equation for process
  - optimum conditions for respiration to take place
  - limiting factors, e.g. waterlogged soils, temperature, carbon dioxide concentration.
- Transportation, role of the vascular bundles that include:
  - xylem – moves water and minerals from roots upwards
  - phloem – moves glucose throughout the plant
  - transpiration – role of stomata in exhaling water evaporation.

- Diffusion:
  - definition of movement of molecules in and out of cells.
- Osmosis:
  - definition of movement of water through semi-permeable membranes.

Learning aim B: Investigate plant life cycles and adaptations to the environment

B1 Plant growth and development

Discovering how plants, trees and crops grow and reproduce, with reference to their life cycles and key terminology.

- Plant and crop types and life cycles, e.g. ephemeral, annual, biennial, herbaceous perennial, perennial; evergreens and deciduous plants.
- Planting times linked to plant types.
- Plant and crop features relevant to the industry and location, e.g. conifers and forestry:
  - monocotyledon characteristics: roots, foliage, stem and flower
  - dicotyledon characteristics: roots, foliage, stem and flower
  - gymnosperm , roots, foliage, stem and flower.
- Flower and crop structures, roles and processes:
  - parts of the seed: e.g. cones, microstrobilie, microsporophylls, megasporophyll*, m*egasporangium*,* testa, cotyledons, epicotyl, plumule, hypocotyl, radicle.
- Germination testing e.g. percentage germination, seed viability, seed health
  - types of pollination and characteristics: self-pollination, cross-pollination, wind pollination, insect pollination
  - process of fertilisation, seed and fruit production
  - seed dispersal: animals, insects, wind, rain, environmental changes and temperature, reasons for dispersal, dormancy
  - types of germination: epigeal, hypogeal.
- Woody perennials e.g. trees, shrubs and hedgerows features and structures, roles and processes:
  - structure to include: inner/outer bark, cambium, sapwood, heartwood
  - growth processes in branch, trunk, roots, including function of apical meristem, vascular meristem/cambium, xylem/phloem
  - extent and process of root growth
  - tree ring analysis to determine structure and variation in growth rates due to differentiation in species, damage, obstruction and seasonal/climatic differences.
- Asexual and vegetative reproduction:
  - meristems, cell division, formation of roots
  - underground storage organs, e.g. rhizomes, bulbs, corms, tubers, tap roots.

B2 Plant adaptations and modifications

How plants, trees and crops adapt to their environment and modify component parts for survival and growth, to ensure healthy plant growth.

- Optimum conditions for healthy plants, taking into account:
  - Topography: aspect
  - exposure to elements e.g. sun, wind, and rain
  - spacing requirements for plants, trees and crops
  - threats to growth from pests and diseases.
- Role of plant parts in adapting to changes in environment e.g. roots, stem, leaves.

- Environmental conditions affecting adaptations and modifications:
  - arid
  - wetland
  - tropical
  - woodland
  - effects of temperature.
- Plant modifications in different environmental conditions: e.g. roots for climbing or storage, leaves, shoots and stems: succulents, spines, tendrils, thorns for protection and scrambling.

Learning aim C: Investigate soil characteristics and effects on plant health

C1 Soil formation, weathering and erosion

Process of soil formation, soil components and soil erosion.

- Soil formation and weathering:
  - parent rock and minerals – igneous, sedimentary, metamorphic, silica, silicates
  - organic matter, decaying plant material, humus, animal matter, animal life, micro-organisms, water, air.
- Soil pit.
- Components of soil e.g.; air, aggregates; organic matter; water.
- Processes of soil weathering e.g.; physical, chemical and biological processes.
- Soil erosion and movement:
  - water, wind, steep slopes, tillage
  - terracettes, rills and gullies, tilting of fence posts, exposed roots, wind-borne particles.

C2 Texture and structure of soils

Recognising soil type by identifying characteristics of texture and structure and how human and environmental activities can impact on growth and development.

- Soil types e.g. sand, silt, clay, aggregate size.
- Soil texture:
  - proportions of sand, silt, and clay.
- Soil characteristics affected by texture:
  - drainage, particle size, colour, nutrients, how it feels, fertility.
- Soil structure: blocky, angular, platy
  - soil profiles, horizons and organic matter.
- Human and environmental influences on soil structure that affect plant growth and development:
  - identify compaction by machinery, use of penetrometer
  - crop rotation and cultivation techniques, effects of cultivation
  - poor drainage
  - weather conditions
  - low nutrient content
  - surrounding mature trees.

C3 Soil water, pH and nutrients

The importance of water in soil, water-holding capacity and its availability to plants and crops, including interpretation of visual evidence and experiments.

- Water availability in soils: percolation, infiltration, water content:
  - saturation point – gravitational water
  - field capacity – capillary water
  - permanent wilting point – hygroscopic water
  - removal of soil water: drainage, ditch and pond clearance
  - visual signs of water accumulation in field.
- Soil pH:
  - importance of soil pH on plant health and root growth
  - the soil pH scale and how to test soil pH, e.g. test kits, soil probe, laboratory analysis
  - reliability and validity of pH testing
  - effects of varying pH levels e.g. stunted growth, distorted foliage and discoloured foliage
  - how to manage and control levels of pH.
- Soil nutrients:
  - the roles of major plant nutrients: nitrogen (N), phosphorus (P), potassium (K), calcium (Ca), magnesium (Mg), sulphur (S)
  - micro plant nutrients: boron (B), chlorine (Cl), copper (Cu), iron (Fe), manganese (Mn), molybdenum (Mo), zinc (Zn)
  - interpreting nutritional information e.g.; fertiliser bags, soil analysis results
  - recognising and managing nutrient deficiencies of major and secondary plant nutrients.

C4 Soil care

The importance of soil care and management to improve soil texture, structure and plant health.

- Management of soil erosion:
  - monitor growth and development of plants in the field.
- Benefits of crop rotation e.g. improving soil erosion, use of cover crops, companion plants, mulching.
- Methods of reducing compaction
  - establishing shelter belts, planting hedgerows.
- Improvement of soil texture and structure:
  - mulching
  - incorporation of organic material e.g. straw
  - breaking-up of a compaction
  - cultivation methods.
- Management of soil nutrients with fertiliser:
  - how and why fertilisers are used in soil care.
- Interpreting nutritional information e.g.; fertiliser bags, soil analysis results.
- Types of fertiliser e.g. straights, compounds liquid, suspensions, prills, granules, slow release, and availability to plants:
  - organic fertilisers e.g. compost and leaf mulch, green manure and farmyard manures
  - inorganic (synthetic) fertilisers e.g. nitrogen, phosphorus, potassium, iron, sulphate of ammonia, sulphate of potash, iron sulphate NH_4NO_3, Muriate of Potash, Triple Super Phosphate.

- Soil mapping to determine fertiliser application rates.
- Common soil problems and how these are managed:
  - poor drainage and waterlogging
  - drought
  - nutrient deficiency.

Transferable skills

Preparing for work

- Research skills – locating relevant information and presenting in a suitable manner
- Working in a team – sharing responsibilities, gathering and sharing information.

Developing practical and technical skills

- Managing information – gathering detail for a purpose and recording accordingly, health and safety regulations.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Investigate plant structure, growth and development		
A.P1 Identify the cell structures of specified plants.	**A.M1** Explain how plant cell structures, and internal and external characteristics of plants influence processing for nutrition and respiration.	**A.D1** Analyse how plant cell structures, internal and external characteristics influence how plants meet their nutrition and respiratory requirements.
A.P2 Outline the internal and external characteristics and components of specified plants.		
A.P3 Outline the processes plants use, to meet nutritional and respiratory requirements.		
Learning aim B: Investigate plant life cycles and adaptations to the environment		
B.P4 Explore the growth and development of specified plants.	**B.M2** Explain the growth and development of specified healthy plants and how plants adapt to their environments.	**B.D2** Assess how growth and development of healthy plants are dependent on environmental factors.
B.P5 Outline how specified plants adapt to environmental conditions.		
Learning aim C: Investigate soil characteristics and effects on plant health		
C.P6 Carry out tests to determine given soil characteristics, water availability, PH and nutrients.	**C.M3** Explain the effects that soil characteristics have on specified plants' health and this can be improved.	**C.D3** Evaluate the relationship between soil characteristics and care and health of a specified plant.
C.P7 Outline how to improve soil texture and structure for a specified plants' health.		

Essential information for assessment decisions

Learning aim A

For distinction standard, learners will:

- provide thorough, clearly labelled, annotated and accurate diagrams of cell structures and internal and external parts of plants, including flowers. They discuss all the plant processes for nutrition and respiration comprehensively, explaining in detail how and where these takes place. Learners discuss at least two limiting factors of the processes and make suggestions on how to overcome these. They provide accurate details on how plants transport nutrients and water. Learners consistently use correct biological names. They show clear links between the processes and the cell structures and internal and external parts of plants.

For merit standard, learners will:

- provide annotated labelled diagrams of cell structures and, internal and external parts of plants, including flowers. They explain most of the plant processes and how and where these take place. Learners give detail on at least two limiting factors of the processes. They explain how plants transport nutrition and water. Learners use correct biological names most of the time. They show some links between the processes and the cell structures and internal and external parts of plants.

For pass standard, learners will:

- present outline labelled diagrams of cell structures and, internal and external parts of plants, including flowers. They summarise the plant processes and how and where these takes place but may only cover two processes. Learners provide at least one limiting factor of the processes. They summarise how plants transport nutrition and water. They use limited biological names but may not always be relevant to the structure or part of the plant. Learners may make some links between the processes and the cell structures and internal and external parts of plants but these may not always be clear.

Learning aim B

For distinction standard, learners will:

- provide accurate comprehensive detail on the plant type and how its life style affects planting times. They explain germination by providing either an accurate fully annotated illustration or accurate details on the development and growth processes for specified plants/trees/crops. Learners clearly distinguish between the development and growth processes showing full understanding of the differences between the two, by providing valid and accurate examples. They explain in detail all the optimum conditions for the development of healthy specified plants/crops/trees. They provide clear examples of environmental conditions affecting the plant/crop/tree growth, clearly explaining why it is important to choose the correct conditions for the particular plant/crop/tree. They provide relevant examples of how plants adapt to environments by modifying themselves e.g. thorns, scrambling.

For merit standard, learners will:

- provide mostly accurate details on the plant type and how its life style affects planting times. They describe germination by providing either an annotated illustration or details on the development and growth processes for specified plants/trees/crops most of the time. Learners distinguish between the development and growth processes, showing some understanding of the differences between the two by using examples. They describe at least two the optimum conditions for the development of healthy specified plants/crops/trees. They provide some examples of environmental conditions affecting the plant/crop/tree growth. They give at least two reasons why it is important to choose the correct conditions for the particular plant/crop/tree. They provide at least two examples of how plants adapt to environments by modifying themselves e.g. thorns, scrambling.

For pass standard, learners will:

- explore a species of plant/crop/tree and outline the plant type and when the most condusive planting times are. They outline the germination process by providing either a basic annotated illustration or a summary on the development and growth processes for specified plants/trees/crops. Learners show some understanding of the differences between the development and growth processes. They outline a minimum of two optimum conditions for the development healthy specified plants/crops/trees. They provide at least one example of an environmental condition affecting the plant/crop/tree growth. They provide at least one example of how plants adapt to environments by modifying themselves e.g. thorns, scrambling.

Learning aim C

For distinction standard, learners will:

- accurately determine all the characteristics of the soil. They will describe the texture and structure, water availability/absorbency, PH and nutrients, by providing accurate examples of each. Learners will make valid recommendations for soil improvement to accommodate the given plant/crops/trees health, providing valid and well thought out ideas. This could be in the context of maintaining soil fertility optimising the yield of a crop or reducing the fertility of any area to establish a community of flowers to enhance biodiversity.

For merit standard, learners will:

- determine most of the characteristics of soil from the tests they conduct. They will describe the texture and structure, water availability/absorbency, PH and nutrients, by providing examples for most of them. Learners will show that they understand how the soil accommodates the given plant/crops/trees health by providing some examples. They make some recommendations on how the soil can be improved.

For pass standard, learners will:

- carry out simple tests to determine soil texture, structure, including checking for compaction, and pH for a given site. They will provide a list of the findings for at least three characteristics e.g. soil type, components, texture and structure, drainage, water availability, PH and nutrient value. The will be able to state why they are carrying out or recommending the actions undertaken.
- provide at least two ways that soil texture, structure and plant health could be improved.

Assessment activity

The summative assessment activity takes place after learners have completed their formative development. The activity should be practical, be set in a realistic scenario and draw on learning from the unit, including the transferable skills. You will need to give learners a set period of time and number of hours in which to complete the activity. *Section 6* gives information on setting assignments and there is further information on our website.

A suggested structure for summative assessment is shown in the *Unit summary* section, along with suitable forms of evidence. This is for illustrative purposes only and can therefore be adapted to meet local needs or to assess across units where suitable opportunities exist. The information in the *Links to other units* section will be helpful in identifying opportunities for assessment across units.

The following scenario could be used to produce the required evidence for this unit. Centres are free to use comparable scenarios or other forms of evidence provided that they meet the assessment requirements of the unit.

Suggested scenario

You are working on a farm which also has a small horticultural nursery as well as an established woodland. The farm would like to develop the range of crops they are growing as well as introduce some new species to the woodland. You need to gather a portfolio of evidence on plant growth and development and carry out practical assessments to understand the soil type. Your work will include developing an understanding the structure of plants and how each part functions to ensure good plant growth. You will need to collect the soil and complete a series of soil tests to determine the soils characteristics. You would then make recommendations on how to improve the soil for better plant health.

If a retake is necessary, an alternative example must be used. The following is an example of a retake assessment activity.

Use of different species and soil within the portfolio.

Further information for tutors and assessors

Delivery guidance

The following are examples of practical activities and workshops that tutors could use when developing sector and transferable skills in the delivery of this unit. Wherever possible, practical activities should be used to help learners develop both personal and sector skills in preparation for the final assessment. These suggestions are not intended as a definitive guide to cover the full GLH of the unit.

Introduction to unit Covered by lectures, tutor led discussions and presentations to explain what the unit content contains, how it will be delivered and assessed. Assessment of prior knowledge to ascertain a start point for all learners. An induction to laboratory procedures may be necessary as will covering the health and safety aspect of this unit including handling of soils. **Suggested time:** about 4 hours.
Activity: Plant practical sessions Tutor led visits/practical activities to identify a range of plants and crops. This can take place in the field, nursery or woodland depending on the resources available. Group discussions on the types of plants seen and their growth patterns. Learners will carry out germination testing to support theory; learners can research nutritional disorders of plants as well as see examples that occur in plants and crops growing in the fields. Learners will use knowledge gained from other units to develop awareness of when and where crops and plants should be grown. **Suggested time:** about 15 hours.
Activity: Plant experiments Tutor led experiments to develop knowledge on cell structure, plant processes e.g. photosynthesis, respiration and transpiration. Learners can create a slide of a plant cell and look at this under the microscope and draw the findings. Recording and reflecting on evidence to contribute to assessment. **Suggested time:** about 10 hours.
Activity: Soil practical sessions Learners will access an area which can be cultivated offering the chance to see the benefits of cultivation on different soil types. Carry out cultivation operations to improve soils using a range of hand-held tools or machinery to identify the changes made to the soil structure. Observe visual signs of compaction through use of a penetrometer and record findings. Tutor led visit to observe drainage being carried out to prevent water stress. **Suggested time:** about 15 hours.
Activity: Soil experiments Tutor led laboratory / in field practical sessions to conduct soil tests working in small groups to carry out pH of soil. They can carry out a visual appraisal of soil type, texture and structure through a tutor led practical. **Suggested time:** about 8 hours.

Essential resources

For this unit, learners will need access to

- A range of plants, woody perennials and crops.
- Simple laboratory equipment suitable to test soil, and plants.

Links to other units

This unit draws on the knowledge and skills taught in:

- Unit 4: Machinery Operations in Agriculture
- Unit 7: Crop Production.

This unit has strong links to:

- Unit 1: Introduction to working in land-based industries
- Unit 3: Agriculture Work Placement.

Employer involvement

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

- guest speakers
- practical sessions
- visits to local science laboratories to observe soil/ plant testing
- design/ideas to contribute to unit assignment/case study/project materials
- work experience
- own business materials as exemplars
- support from local business staff as mentors.

Unit 3: Horticulture Work Placement

Level: **2**

Unit type: **Mandatory**

Assessment type: **Internal**

Guided learning hours: **60**

Unit in brief

Learners will develop the skills and behaviours needed to work successfully in the horticultural sector.

Unit introduction

Do you think you can work well in the horticulture sector? Work placement gives a unique insight into working life and can help you to work out what you might want to do in the horticulture sector. You will also be able to add new skills to your curriculum vitae (CV), such as communication and teamwork.

In this unit, you will develop and apply the important skills needed to perform confidently and to a high standard in a working environment. You will look for and take part in a work placement, ideally in a horticulture sector that appeals to you. Talking to, listening to and watching those in the industry is the best way of learning about the work involved and what is required of an employee.

This unit will give you the fundamental work skills needed to apply for and gain employment in the horticulture sector. The unit includes 75 hours of real-life work experience.

Learning aims

In this unit you will:

A Investigate and apply for a horticulture work placement

B Demonstrate work skills relevant to a horticulture work placement

C Review own horticulture work placement.

Unit summary

Learning aim	Key teaching areas	Summary of suggested assessment evidence
A Investigate and apply for a horticulture work placement	**A1** Investigating a work placement **A2** Applying for a work placement	A portfolio of work-related research and completed application documents, evidenced by observation records or video evidence.
B Demonstrate work skills relevant to a horticulture work placement	**B1** Professional behaviours **B2** Communication skills **B3** Safe working	A work placement report supported by: • observation records/witness statements • video and/or photographic evidence of all practical activities • reported evidence of appropriate work skills and hours.
C Review own horticulture work placement	**C1** Review of work placement **C2** Self-development and areas for improvement	Written evidence of review, reflection and self-development/areas for improvement.

Key teaching areas in this unit include:

Sector skills	Knowledge	Transferable skills/behaviours
• Job searching • Work research/application processes • Workplace behaviour/ techniques • Work skills	• Effective teamwork • Effective communication • Self-development	• Communication • Problem solving • Self-management and development • Thinking skills/adaptability • Working with others

Unit content

Knowledge and sector skills

Learning aim A: Investigate and apply for a horticulture work placement

A1 Investigating a work placement

- Work search resources, e.g. industry magazines, newspapers, internet job sites, social media, local advertisements.
- Documents:
  - job advertisement
  - job/role description
  - essential and desirable personal requirements
  - using these documents in an appropriate way.
- Identifying the skills required to work in the sector, e.g. interpersonal skills, communication, technical knowledge, practical skills.

A2 Applying for a work placement

- Different methods of applying, e.g. application forms, CVs, covering letters, online applications, telephone enquiries, applying in person.
- How and where to find work application information, e.g. from human resources (HR) departments, company/organisation websites, job websites, local and national information sources, media, employment agencies.
- Job research: paying attention to all details of the job application so that nothing relevant is left out; ordering different types of information in a logical manner in the application document; checking whether or not to include supporting documents, e.g. work permits, certificates, personal identification; using personal statements to create a positive impression of skills and interests.

Learning aim B: Demonstrate work skills relevant to a horticulture work placement

B1 Professional behaviours

- Working environment skills: appropriate attendance, appropriate personal presentation, positive attitude (appropriate demeanour, use of own initiative).
- Time management, including arriving at work on time, completing tasks in allocated time, e.g. checking crop growth or reporting to supervisors.
- Administrative skills, e.g. maintaining records, using email/phone, using workplace documents, using electronic equipment.
- Problem solving, e.g. finding alternative solutions to problems, using technology to work more efficiently.
- Working with others, e.g. team briefing, completing maintenance and practical tasks, handling, communicating and implementing changes.
- Appreciation of others' needs and points of view, respecting equality laws/social diversity in the workplace.

B2 Communication skills

- Interpersonal skills, including appropriate speaking and listening skills.
- Use of appropriate and professional language.
- Use of initiative/asks for advice if unsure.
- Ability to receive and follow instructions.
- Interacting with visitors and staff appropriately.
- Communicating tasks completed.

B3 Safe working

- Safe working following protocols, following other work placement policies and procedures.
- Working within legal/good practice frameworks, e.g. Health and Safety at Work etc. Act 1974, Control of Substances Hazardous to Health (COSHH) Regulations 2002 etc.
- Use of personal protective equipment (PPE).
- Safe handling procedures.
- Safe working with tools and equipment.
- Risk assessment.

Learning aim C: Review own horticulture work placement

C1 Review of work placement

- SWOT (strengths, weaknesses, opportunities and threats) relating to work placement.
- Identifying what went well and what did not go so well, including time taken to complete tasks, interaction with supervisors/managers, how well tasks were completed, factors taken into account when caring for plants.
- Using feedback from employers when evaluating performance.

C2 Self-development and areas for improvement

- Self-development:
  - identifying own training and development needs, e.g. skills audit
  - meeting/discussion with supervisor
  - review and reflection.
- Areas for improvement: based on own reflection, assessment (and feedback from others, if appropriate), e.g. get feedback and suggestions from all team members before deciding on a solution to a problem in the team task.

Transferable skills

Communication

- Verbal, written and face-to-face communication with colleagues and tutors.
- Applying for placements in appropriate formats.
- Reviewing own performance.
- Reading feedback from employers.
- Speaking to customers/clients.

Problem solving

- Solving customers' problems.
- Carrying out practical tasks.
- Identifying and choosing the right equipment.

Self-management and development

- Reviewing own performance after a placement.
- Identifying areas for improvement.
- Creating personal action plans for development.

Thinking skills/adaptability

- How to tackle job advertisements.
- Using information and relating own skills.
- Identifying own skills and areas for improvement.

Working with others

- Working with individuals or teams while on work placement.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Investigate and apply for a horticulture work placement		
A.P1 Demonstrate appropriate investigation for a work placement.	**A.M1** Demonstrate effective use of search and application documents for a work placement.	**A.D1** Justify work placement search and application activities carried out, recommending improvements.
A.P2 Use appropriate application skills for a work placement.		
Learning aim B: Demonstrate work skills relevant to a horticulture work placement		
B.P3 Demonstrate adequate use of communication skills and practices during the work placement.	**B.M2** Demonstrate appropriate use of work skills and practices, working effectively with others during the work placement.	**B.D2** Demonstrate confident use of work skills and practices, working confidently with others to achieve effective outcomes during the work placement.
B.P4 Demonstrate adequate behaviours during the work placement.		
Learning aim C: Review own horticulture work placement		
C.P5 Describe own tasks and activities carried out during own work placement.	**C.M3** Describe own performance during tasks and activities carried out, using relevant examples to demonstrate strengths and areas for improvement.	**C.D3** Explain own performance, using examples to identify strengths, areas for improvement and appropriate training and self-development needs in response to feedback from others.
C.P6 Identify own strengths and areas for improvement during a work placement.		

Essential information for assessment decisions

In order to provide evidence for assessment and to achieve this unit, learners are required to complete 75 hours of work placement. The work placement must be with an employer, i.e. in an external setting. Work placement must be in working environments and could be with more than one provider if necessary.

Learning aim A

For distinction standard, learners will:

- show understanding of their own limitations during a work application process, and of how their work application skills could be improved moving forward
- give evidence of their suitability for the work placement in question.

For merit standard, learners will:

- use relevant skills to provide an appropriate and developed CV and letter of application for a suitable work placement.

For pass standard, learners will:

- use work-searching skills to locate two appropriate work advertisements and job descriptions
- use work-searching skills to find one potential horticulture work placement
- use skills to apply for a relevant work placement
- provide a CV and completed application form for a work placement
- demonstrate acceptable use of spelling, grammar and word punctuation.

  (Note: application for, as opposed to securing, a work placement is the focus of assessment for pass.)

Learning aims B and C

It is a requirement that all learners complete 75 hours of valid work placement in an external setting. This must be in addition to the 60 guided learning hours required for the delivery of this unit. Work placement need not be limited to one provider, however, work placement in horticultural working environments run by, and/or on the site of, the centre is not appropriate. Suggested evidence records for the work placement can found on the Pearson website.

For distinction standard, learners will:

- give evidence of consistently appropriate personal presentation and a positive attitude during work placement
- give evidence of excellent time management and problem-solving skills
- need little, if any, intervention by supervisor(s)
- work effectively with others in the work placement and have a full appreciation of others and other points of view demonstrated
- consistently demonstrate effective safe working
- show a clear awareness of strengths and areas for improvement and development with reference to examples of working practice and behaviour
- show a clear understanding of how feedback from others can shape self-development needs constructively.

UNIT 3: HORTICULTURE WORK PLACEMENT

For merit standard, learners will:

- give evidence of appropriate personal presentation and a positive attitude during work placement
- give evidence of appropriate time management and problem-solving skills
- need some intervention by supervisor(s)
- work appropriately with others in the work placement and have some appreciation of others and other points of view demonstrated
- demonstrate effective safe working in and around horticultural environments
- show an awareness of strengths and areas for improvement, with reference to examples of working practice and behaviour
- provide reflective information on how they could benefit from training and development, justified in relation to their own career aspirations, using feedback from others.

For pass standard, learners will:

- evidence adequate use of professional behaviours, communication skills and safe working skills as listed in the unit content
- need a lot of intervention from their supervisor(s)
- give information on the tasks and work activities they carried out, their strengths, areas for improvement and how they worked in respect of legal rights and responsibilities, as detailed in the unit content
- include evidence of their interpersonal and communication skills, and time-management and teamwork skills.

Assessment activity

The summative assessment activity takes place after learners have completed their formative development. The activity should be practical, be set in a realistic scenario and draw on learning from the unit, including the transferable skills. You will need to give learners a set period of time and number of hours in which to complete the activity. *Section 6* gives information on setting assignments and there is further information on our website.

A suggested structure for summative assessment is shown in the *Unit summary* section, along with suitable forms of evidence. This is for illustrative purposes only and can therefore be adapted to meet local needs or to assess across units where suitable opportunities exist. The information in the *Links to other units* section will be helpful in identifying opportunities for assessment across units.

Learners should look for a work placement in a working environment appropriate to the horticulture sector and investigate the steps involved in applying for a placement. Once on a work placement, each learner will show that they have the appropriate skills and behaviours that an employer would expect. When the placement is completed, learners will review their experience and consider appropriate training and development they could take advantage of. Learners need to take account of feedback received from others, for example workplace supervisors and tutors.

Further information for tutors and assessors

Delivery guidance

The following are examples of practical activities and workshops that tutors could use when developing sector and transferable skills in the delivery of this unit. Wherever possible, practical activities should be used to help learners develop both personal and sector skills in preparation for the final assessment. These suggestions are not intended as a definitive guide to cover the full GLH of the unit.

Introduction to unit Poster making; work skills and behaviours for employment in horticulture. **Suggested time:** about 4 hours.
Activity: Job applications Small group work/teamwork on scenario-based projects, searching for and applying for jobs of interest in the horticulture sector. **Suggested time:** about 8 hours.
Activity: Developing skills Holding group meetings to develop communication and team working skills. **Suggested time:** about 4 hours.
Activity: Developing other working skills and behaviours Role play developing other working skills and behaviours in varying scenarios. **Suggested time:** about 3 hours.
Activity: Reviewing performance Work placement review of own performance. **Suggested time:** about 4 hours.

Essential resources

For this unit, learners will need access to:

- a suitable site(s) for work placement
- appropriate transport to suitable sites (centres may need to organise)
- first-aid facilities and appropriately trained staff (wherever practical activities are carried out).

Links to other units

This unit has strong links to:

- Unit 1 Introduction to Working in Land-based Industries
- Unit 2: Introduction to Plant and Soil Science
- Unit 4: Land-based Machinery Operations
- Unit 11: Estate Maintenance in Horticulture.

Employer involvement

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

- fit-for-purpose work placements
- guest speakers
- own business materials as exemplars, e.g. use of workplace literature and information sources.

Unit 4: Land-based Machinery Operations

Level: **2**

Unit type: **Mandatory**

Assessment type: **Internal**

Guided learning hours: **30**

Unit in brief

Learners will develop the skills needed to prepare, safely operate and maintain land-based machinery for use in the countryside and horticulture industries.

Unit introduction

In the land-based sector there are many activities that require the safe and responsible use of machinery in order to work effectively, and so that routine tasks can be completed. Due to the range of activities that can be carried out, it is important that you are able to operate different types of machinery safely and responsibly, following operational guidelines and instructions.

In this unit, you will learn about a range of machinery used for routine activities across the countryside and horticulture industries. You will develop the skills needed to identify the correct equipment to use, and you will carry out initial preparation, routine maintenance and safe operation to complete tasks effectively.

This unit will develop your skills to meet industry expectations, allowing you to work safely and responsibly with land-based machinery. It will support progression to Level 3 land-based qualifications or to an Apprenticeship as a trainee park ranger, gardener, local council worker, tractor driver, sprayer operator, contractor, or nursery person.

Learning aims

In this unit you will:

A Explore the machinery, purposes and operations that can be used for land-based activities

B Prepare and maintain machines for land-based activities

C Carry out safe and responsible machine operation for routine land-based activities.

Unit summary

Learning aim	Key teaching areas	Summary of suggested assessment evidence
A Explore the machinery, purposes and operations that can be used for land-based activities	**A1** Land-based machinery **A2** Machine operation, engines and mechanics	A written diary of activities, along with video evidence of learners identifying, preparing, maintaining and operating machinery.
B Prepare and maintain machines for land-based activities	**B1** Prepare machinery **B2** Maintenance of machinery	
C Carry out safe and responsible machine operation for routine land-based activities	**C1** Operating machinery **C2** Post-activity machinery checks and aftercare	

Key teaching areas in this unit include:

Sector skills	Knowledge	Transferable skills/behaviours
• Planning to use machinery and preparing it for safe use • Identifying correct machinery for routine tasks • Operating machinery responsibly and safely • Basic maintenance of routine machinery • Operational checks pre- and post-machinery use	• Professional practice • Safe practice • Following operational instructions • Farm worker responsibilities • Health and safety • Basic mechanical understanding of machinery	• Problem solving and communication • Self-management and development • Preparing for work • Management of information

Unit content

Knowledge and sector skills

Learning aim A: Explore the machinery, purposes and operations that can be used for land-based activities

Learners will develop an understanding of the machines used in the land-based sector and underlying principles of operation.

A1 Land-based machinery

- Land-based machinery, e.g. tractors, trailers, harrows, forklifts, flail mowers, telescopic handlers, lawnmowers, rotavators, quads and buggies, cutting and pruning machinery.
- Land-based activities, e.g. hedge laying, grass cutting, spraying.
- How to use equipment:
  - understanding and using operational manuals
  - requirements of different types of equipment per manufacturer/industry guidelines
  - review ground conditions for equipment used, e.g. tractors not being suitable for heavily saturated ground, stability.
- Licensing conditions, such as:
  - requirements of operator, e.g. tractor licence and relevant qualifications
  - weight limits of loads.

A2 Machine operation, engines and mechanics

- Learners will develop an understanding of the operation of engines and the mechanical components of land-based machinery.
- Combustion engines, such as:
  - compression-ignition (CI) and spark-ignition (SI) engines
  - two-stroke and four-stroke cycles
  - diesel, petrol, bio-products, lubricants
  - air- and liquid-cooling systems
  - cold start systems.
- Emissions legislation.
- Electric engines, including batteries and electrical motors.
- Component parts, e.g. cylinder block and head, flywheel, clutch assemblies, crankshaft, pistons and rings, connecting rod and bearings, valves and springs, gaskets and seals, cooling-system components, fuel-system components, lubrication oil filters, starter motor, generators.
- Engine use, e.g. self-propelled units, handheld equipment, static units, drive systems, clutches, shafts, belts and chains, transmission gearbox, compressed air and hydraulics, engine speed, power and torque.

Learning aim B: Prepare and maintain machines for land-based activities

B1 Prepare machinery

- Awareness of common hazards, such as exhaust fumes, heat, noise, vibrations, stored energy, sparks, and machine stability.
- Personal safety requirements, such as personal protective equipment (PPE), footwear, personal clothing protection, barrier cream, gloves, eye protection, ear defenders, chemicals protection (apron) and risk assessments.
- Safe working principles.
- Starting procedures and pre-start checks, such as:
  - tractor/power-unit preparation, oil, coolant, diesel, tyres, battery
  - mounting and dismounting procedures
  - cold starting
  - fuelling procedures: keep tank full overnight, bleeding air from pipes, fuel/oil mixes for two stroke engines
  - interpret decals
  - interpret odometer
  - locate main controls, e.g. gauges, levers, buttons for electronics, pedals, dipsticks
  - tyre pressures and changing tyres.

B2 Maintenance of machinery

- Maintenance tools:
  - selection and safe use of hand tools
  - measuring equipment
  - use of manufacturers' service literature
  - lubrication oil data
  - daily and periodic checks and maintenance schedules.
- Maintenance checks of machinery, including:
  - oil changes
  - cutting blades, including sharpening/replacement (where appropriate)
  - battery checks and changes
  - check hydraulic pump
  - fuel change
  - replacing/cleaning air filters on handheld machinery
  - identify necessary repairs
  - bleeding radiators
  - waste disposal
  - current regulations and legislation.

Learning aim C: Carry out safe and responsible machine operation for routine land-based activities

C1 Operating machinery

- Selecting and using machine(s) for specific activities and, where appropriate, relevant attachments (e.g. trailers, sprayers, rotavators, hedge cutters, mowers).
- Following procedures and operational guidelines correctly (e.g. switching on the machine correctly, carrying out initial checks).
- Demonstrating awareness of health and safety, e.g. correct PPE and adherence to safe working practices and operational guidelines.
- Power-unit operation: selection of appropriate gear to match ground/road conditions; transport safely to site; warning signals.
- Considering physical and natural conditions (e.g. weather conditions, different ground conditions such as clay, sand, peat) and how to adapt.
- Correct safe and responsible operation of driven machinery and handheld machinery.

C2 Post-activity machinery checks and aftercare

Learners will understand the necessary steps following completion of an activity.

- Cleaning machines after use where appropriate (e.g. power washing a combine after use; removing mud from tyres so as not to drop the mud on the road; removing dirt from equipment – especially fans and filters; lubrication of engines; removal of any leftover chemicals, e.g. sprayers; inspect equipment for any damage).
- Storage and parking (e.g. safe storage, security, correct parking of vehicles).
- Completion of records; reporting maintenance requirements following use, e.g. driver/vehicle logs, maintenance schedules.

Transferable skills

Problem solving and communication

- Working as a team.
- Preparing, maintaining and operating equipment/identifying problems with machinery and developing solutions.

Self-management and development

- Working in a professional environment, managing own time, reviewing own progress, working under pressure and working with limited supervision.

Preparing for work

- Communicating with others in tasks.
- Planning practical tasks and verbally communicating actions.
- Giving reasons for using certain methods, techniques and decisions made.
- Carrying out practical and routine machinery maintenance.
- Developing practical and technical skills.
- Demonstrating methods used to maintain machinery equipment.

Management of information

- Interpreting and understanding industry and manufacturer instructions and guidelines.
- Relating legislation and codes of practice to practical situations.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Explore the machinery, purposes and operations that can be used for land-based activities		
A.P1 Identify types of machines used to complete routine land-based activities.	**A.M1** Describe the types of land-based machines used for routine land-based activities and how to operate them.	**A.D1** Compare and contrast the types of land-based machines and how to operate them in order to carry out routine activities.
A.P2 Outline how to operate land-based machines.		
Learning aim B: Prepare and maintain machines for land-based activities		
B.P3 Carry out appropriate preparation and maintenance of land-based machinery.	**B.M2** Carry out effective preparation and maintenance of land-based machinery.	**B.D2** Carry out competent and confident machinery preparation and maintenance of land-based machinery.
Learning aim C: Carry out safe and responsible machine operation for routine land-based activities		
C.P5 Demonstrate safe use of land-based machinery for routine activities.	**C.M3** Demonstrate effective use of land-based machinery and post-activity checks and aftercare for routine activities.	**C.D3** Demonstrate confident use of land-based machinery and post-activity checks and aftercare for routine activities.
C.P6 Demonstrate basic post-activity checks and aftercare.		

Essential information for assessment decisions

Learning aim A

For distinction standard, learners will:

- show a comprehensive understanding of the similarities and differences between at least two types of machines, clearly identifying the type of machine with the relevant routine activities and associated operational methods
- make relevant connections between the uses of types of machinery, with reference to appropriate land-based activities, ground-stability factors and regulatory requirements
- demonstrate a robust understanding of the operation of engines and mechanical components of machinery used routinely in the industry
- demonstrate depth and breadth in their understanding of engines and mechanics, for example how petrol, diesel engines and electric motors work
- demonstrate comprehensive and appropriate use of technical language.

For merit standard, learners will:

- show understanding of the difference between at least two types of machines, identifying the type of machine, the routine land-based activities they can be used for and associated operational methods
- make connections between types of machinery, and the operational conditions that determine the activities being carried out, such as ground, weather and licensing
- show an appropriate understanding of the operation of engines and the mechanical components of machinery used routinely in the industry
- show depth and breadth in their understanding of engines and mechanics, for example how petrol, diesel engines and electric motors work
- use relevant technical language.

For pass standard, learners will:

- show a basic understanding of the difference between at least two types of machines, with reference to routine land-based activities and associated operational methods
- list some of the operational conditions that determine machine activities, such as ground, weather and licensing
- have a basic understanding of the operation of engines and the mechanical components of machinery used routinely in the industry
- show some understanding of engines and mechanics, for example how petrol, diesel engines and electric motors work
- use mostly non-technical language with some inaccuracies in terminology choice and use.

Learning aim B

For distinction standard, learners will:

- work with an increased level of independence to demonstrate a robust performance in the preparation and maintenance of at least two items of relevant, up-to-date machinery in land-based practices
- demonstrate a strong awareness of common hazards present, suggesting measures to reduce the risk of such hazards mentioned in the unit content
- carry out detailed and logical preparation of tasks, showing breadth and depth in understanding the importance and accuracy of preparation before use
- carry out routine maintenance on at least two items of machinery. The maintenance will be logical, well developed and accurate in its execution, requiring limited tutor involvement
- give a consistent explanation of the practical process, while carrying out routine maintenance covering safe and correct tool selection and comprehensive maintenance checks as per the unit content.

For merit standard, learners will:

- work with some level of tutor supervision to demonstrate an effective approach in the preparation and maintenance of at least two items of relevant up-to-date machinery in land-based practices
- demonstrate an awareness of common hazards present, suggesting variable measures to reduce the risk of such hazards mentioned in the unit content
- carry out logical preparation of tasks, showing understanding of the importance and accuracy of preparation prior to use
- carry out routine maintenance on at least two items of machinery. The maintenance will be logical and accurate but not fully developed in its execution, requiring some tutor involvement
- give a detailed explanation of the practical process, while carrying out routine maintenance covering safe and correct tool selection and reasonably accurate maintenance checks as per the unit content.

For pass standard, learners will:

- work with a significant level of tutor supervision to demonstrate a basic approach in the preparation and maintenance of at least two items of relevant up-to-date machinery in land-based practices
- demonstrate some awareness of common hazards present, with limited suggestions of variable measures to reduce the risk of such hazards mentioned in the unit content
- carry out preparation tasks, showing a limited breadth and understanding of the importance and accuracy of preparation prior to use
- carry out basic routine maintenance on at least two items of machinery
- give some explanation of the practical process, while carrying out routine maintenance covering safe and correct tool selection and mostly accurate maintenance checks as per the unit content.

Learning aim C

For distinction standard, learners will:

- competently select and use appropriate machines for specific land-based activities, accurately following correct procedures and adhering to necessary operational guidelines
- demonstrate safe and responsible use of at least two items of machinery when carrying out land-based activities
- demonstrate a robust understanding of the need to care for machinery following use, giving comprehensive explanations for the required cleaning, storage and record completion required for each individual piece of equipment
- select at least two items of machinery routinely used in land-based activities, showing a comprehensive understanding of the requirements and giving confident reasoning for carrying out aftercare of the machinery
- select appropriate techniques for aftercare supported by well-developed reasoning for the choices made.

For merit standard, learners will:

- select and use machines for specific land-based activities, following correct procedures and operational guidelines
- demonstrate safe and responsible use of at least two items of machinery when carrying out land-based activities
- demonstrate an effective understanding of the need to care for machinery following use, giving detailed explanations for the required cleaning, storage and record completion required for each individual piece of equipment
- select appropriate techniques for aftercare supported by limited reasoning for the choices made.

For pass standard, learners will:

- use machines for specific land-based activities, following some correct procedures and operational guidelines
- demonstrate safe use of at least two items of machinery with guidance when carrying out routine land-based activities
- demonstrate a limited understanding of the need to care for machinery following use, giving some explanations for the required cleaning, storage and record completion required for each individual piece of equipment
- cover at least two items of machinery routinely used in land-based activities, showing a limited understanding of the requirements, with little or no reasoning for carrying out aftercare of machinery
- select mostly appropriate techniques for aftercare supported by little or no reasoning for choices made.

Assessment activity

The summative assessment activity takes place after learners have completed their formative development. The activity should be practical, be set in a realistic scenario and draw on learning from the unit, including the transferable skills. You will need to give learners a set period of time and number of hours in which to complete the activity. *Section 6* gives information on setting assignments and there is further information on our website.

A suggested structure for summative assessment is shown in the *Unit summary* section, along with suitable forms of evidence. This is for illustrative purposes only and can therefore be adapted to meet local needs or to assess across units where suitable opportunities exist. The information in the *Links to other units* section will be helpful in identifying opportunities for assessment across units.

The following scenario could be used to produce the required evidence for this unit. Centres are free to use comparable scenarios or other forms of evidence provided that they meet the assessment requirements of the unit.

Suggested scenario

You are working in the land-based industry as a groundsperson. You are required to plan, risk assess, prepare, maintain and operate a minimum of two pieces of machinery for specific land-based activities.

If a retake is necessary, an alternative example must be used. The following is an example of a retake assessment activity.

Two different pieces of machinery must be used.

Further information for tutors and assessors

Delivery guidance

The following are examples of practical activities and workshops that tutors could use when developing sector and transferable skills in the delivery of this unit. Wherever possible, practical activities should be used to help learners develop both personal and sector skills in preparation for the final assessment. These suggestions are not intended as a definitive guide to cover the full GLH of the unit.

Introduction to unit A tutor-led discussion on the different types of machinery that can be used for a range of operations in the industry, for example mowing, pruning, rotavating and spraying. The different employment roles and responsibilities in the sector should be covered, as well as how these differ in the countryside and horticulture industries. Learners could spend time researching a range of employment roles and what their responsibilities would be in regards to the use of machinery. The relevant industry requirements could also be included, for example tractor licences. **Suggested time:** about 4 hours.
Activity: Preparing machinery Tutor-guided sessions on the procedures and practices used to prepare machinery for safe use. The sessions could start by some initial theory followed by practical learner-focused activity using different types of petrol and diesel routine machinery. Learners develop and use pre-start checklists, and carry out activities to develop skills in groups, assessing actions and decisions made in their preparations. **Suggested time:** about 6 hours.
Activity: Maintenance of machinery This aspect can include demonstrations by staff members, as well as external speakers from machinery companies. Learners should be shown how each piece of equipment should be used. This could be through practical demonstrations, observations and other learning materials. A discussion should take place before each demonstration to identify when it is suitable to use each piece of equipment, and when it is not appropriate. Once learners have been shown how to use each piece of equipment they will be required to observe the relevant machine preparation and maintenance procedures. Following this, learners will be expected to carry out full routine maintenance. The relevant health and safety considerations should be highlighted throughout. **Suggested time:** about 10 hours.
Activity: Operation and aftercare of machinery Learners should be given the opportunity to operate relevant land-based machinery. They would start by doing this with some support, before being able to operate each piece independently. The machinery can belong to the establishment, or this activity could be carried out during visits or during a placement. It is imperative that learners are shown how to use each piece before being given the opportunity to operate them. Tutor sessions on aftercare could be integrated into practical operation sessions for consistency. **Suggested time:** about 10 hours.

Essential resources

For this unit, learners will need access to:

- a range of land-based operations machinery, as well as a safe environment in which to operate them
- up-to-date and relevant land-based machinery
- mechanical workshops, tools and equipment
- suitable spaces to operate machinery.

Links to other units

This unit has strong links to:

- Unit 1: Introduction to Working in Land-based Industries
- Unit 3: Horticulture Work Placement
- Unit 8: Maintain Sports and Amenity Turf
- Unit 10: Construction and Maintenance of Hard Landscapes
- Unit 11: Estate Maintenance in Horticulture.

Employer involvement

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

- demonstrations, for example how to use a range of their equipment
- work experience
- visits
- support from local business staff as mentors.

Unit 5: Propagation Techniques

Level: **2**

Unit type: **Optional**

Assessment type: **Internal**

Guided learning hours: **30**

Unit in brief

Learners will develop an understanding of the different requirements and techniques used in plant propagation and will develop the skills to sow seeds and use vegetative methods.

Unit introduction

Being able to propagate plants successfully is an essential skill to learn when producing and selling plants. Having a knowledge of the requirements of propagated plants will ensure successful establishment and increase plant numbers for sale or planting within grounds.

In this unit, you will look at many different methods of propagation, from leaf, root and stem cuttings to layering, division and seed. You will learn about the factors that affect propagation, and the requirements of plants and their aftercare needs to ensure their success. You will then have the knowledge to carry out practical propagation via vegetative methods and by seed, with a clear understanding of how to provide the aftercare requirements that the plants need.

The skills and knowledge that you will gain in this unit will support progression to Level 3 qualifications or to an Apprenticeship as a nursery grower, a plant producer or a gardener in the grounds of an estate. Being able to successfully propagate plants and provide aftercare will be a huge advantage in your role.

Learning aims

In this unit you will:

A Explore plant propagation methods

B Be able to propagate plants using vegetative and seed methods

C Be able to carry out aftercare on plants propagated by vegetative and seed methods.

Unit summary

Learning aim	Key teaching areas	Summary of suggested assessment evidence
A Explore plant propagation methods	**A1** Vegetative and seed propagation techniques **A2** Factors that influence vegetative and seed propagation	Two factsheets on plant propagation via vegetative propagation and by seed. A portfolio of evidence that includes: • evidence of plant propagation via vegetative and seed methods • evidence of aftercare for propagated plants • records of propagation.
B Be able to propagate plants using vegetative and seed methods	**B1** Preparation and propagation of plants	
C Be able to carry out aftercare on plants propagated by vegetative and seed methods	**C1** Monitoring and establishing propagation material **C2** Propagated plant aftercare	

Key teaching areas in this unit include:

Sector skills	Knowledge	Transferable skills/behaviours
• Tools, equipment and resource use • Propagation techniques using vegetative methods • Propagation techniques using seed • Assessing risk and working safely	• Plant types to suit the propagation method • Preparing materials ready for propagation • Factors that affect stock and seed selection • Factors that affect propagation	• Developing practical and technical skills • Management of information • Preparing for work

Unit content

Knowledge and sector skills

Learning aim A: Explore plant propagation methods

Learners will develop an understanding of the methods used for successful vegetative and seed prorogation.

A1 Vegetative and seed propagation techniques

Learners will identify different characteristics of vegetative and seed propagation, the factors that influence selection, and the techniques and timings used for both methods.

- Types of vegetative cutting:
  - stem cutting – softwood; greenwood; semi-ripe; hardwood, including evergreen and deciduous plants
  - leaf cuttings – identifying parts of the leaf, including petiole and veins
  - root cuttings during the dormant season (October to March)
  - simple layering in spring using shrubs or climbers
  - division of herbaceous perennials in early spring.
- Factors that influence vegetative stock selection:
  - non-flowering
  - healthy – containing no pests
  - evidence of diseases or disorders
  - leaving stock plants evenly pruned
  - time of year
  - temperature
  - age of material.
- Hygiene practices when preparing stock, e.g. clean tools and equipment, tidy area to work, not using diseased material.
- Seed selection, for example:
  - annuals – plants that complete their life cycles in one growing season
  - biennial – plants that take two growing seasons to complete their life cycle, in the first they produce vegetative growth, then flower in the second
  - herbaceous perennials: plants with outer woody stems that die to the ground at the end of the growing season and return the following spring
  - vegetables – plants that are grown as food crops.
- Seed sourcing:
  - catalogues
  - garden centres
  - in bulk from large seed suppliers
  - harvesting, collecting and storing own seed.
- Seed treatments:
  - coated seed to enhance seed performance by coating in fertiliser or a disease-resistant coating
  - pelleted seed to change size and shape for planting ease
  - scarification, chipping or scraping part of the seed coat for faster germination
  - soaking to soften seed coat for faster germination
  - temperature treatments to break dormancy.

A2 Factors that influence vegetative and seed propagation

- Environmental factors that affect rooting, establishment and germination, including:
  - temperature
  - light availability
  - water
  - protection
  - space
  - gases.

Learning aim B: Be able to propagate plants using vegetative and seed methods

B1 Preparation and propagation of plants

Learners will develop the skills and knowledge to be able to select and prepare the propagation area and material to ensure its success.

Vegetative propagation

- Preparation of propagation area, including:
  - space
  - water availability
  - protection
  - temperature control
  - trays, modules, pots, outdoor areas
  - soil – pre-mixed, peat-free, own-mix compost.
- Tools and equipment, including:
  - secateurs
  - loppers
  - knife
  - watering can.
- Vegetative stock selection and preparation, including:
  - healthy stock
  - hygienic area and tools
  - even preparation
  - rooting hormone
  - secure placing in container
  - labelling.

Seed propagation

- Preparation of propagation area, including:
  - space
  - water availability
  - protection
  - temperature control
  - trays, modules, pots, outdoor seedbeds
  - soil – pre-mixed, peat-free, own-mix compost.
- Tools and equipment, including:
  - striking board
  - pressing board
  - sieve
  - hoe for seed drills outside
  - watering can.

- Seed selection and preparation, including:
  - quality
  - quantity
  - correct handling of seed suited to size
  - hygienic area
  - even broadcast
  - covering
  - labelling.

Learning aim C: Be able to carry out aftercare on plants propagated by vegetative and seed methods

C1 Monitoring and establishing propagation material

- Monitoring vegetative material or germinating seeds for:
  - watering requirements
  - moving location, including from heated bench once rooted or uncover after germination
  - temperature
  - pests, diseases or disorders
  - dead or dying plant material
  - thinning out seedlings
  - weeds.

C2 Propagated plant aftercare

Learners will work safely when providing propagated plants with the correct aftercare in order to ensure the success of the plants, and they will keep accurate records.

- Aftercare requirements for vegetative propagation, including:
  - handling material
  - container size/area space
  - growing media
  - water
  - growing-on.
- Aftercare requirements for seedlings, including:
  - pricking out seedlings
  - handling seedlings
  - container size
  - potting media
  - water
  - growing-on.
- Record keeping of propagated plants and aftercare, including:
  - timings
  - plant name
  - growing media used
  - date
  - quantities
  - success rates.

Transferable skills

Developing practical and technical skills

- Demonstrate skills when propagating plants via vegetative methods and by seed.
- Select and use appropriate equipment and resources when propagating plants.

Management of information

- Organise information on factsheets.
- Present information on factsheets using appropriate IT formats.

Preparing for work

- Apply knowledge and understanding when designing factsheets.
- Be able to show awareness of health and safety hazards and risks.
- Be able to exhibit the qualities and attributes required while working practically.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Explore plant propagation methods		
A.P1 Identify the characteristics of different techniques used for vegetative and seed propagation.	**A.M1** Describe the characteristics of different techniques used for vegetative and seed propagation, with reference to some of the factors that influence the selection of the methods used for both.	**A.D1** Explain in detail the characteristics of different techniques used for vegetative and seed propagation, comparing and contrasting the factors that influence the methods used for both.
A.P2 Outline the factors that influence methods used for vegetative and seed propagation.		
Learning aim B: Be able to propagate plants using vegetative and seed methods		
B.P3 Carry out appropriate preparation of plant material for vegetative and seed propagation tasks.	**B.M2** Demonstrate effective preparation and propagation techniques when carrying out vegetative and seed propagation tasks.	**B.D2** Demonstrate competent preparation and confidently perform vegetative and seed propagation tasks.
B.P4 Perform basic propagation techniques using vegetative and seed propagation methods.		
Learning aim C: Be able to carry out aftercare on plants propagated by vegetative and seed methods		
C.P5 Provide basic monitoring and aftercare of propagated plants, keeping some records of tasks.	**C.M3** Provide appropriate monitoring and ongoing aftercare for propagated plants, keeping detailed records of tasks.	**C.D3** Provide effective monitoring and aftercare for propagated plants, clearly documenting tasks to support productivity and growth.

Essential information for assessment decisions

Learning aim A

For distinction standard, learners will:

- produce skilfully designed factsheets on at least three different techniques of vegetative and seed propagation that explain detailed characteristics of the techniques. The factsheets will be well thought out, organised and contain accurate details
- be able to compare and contrast the factors that influence the selection of the methods detailed in their factsheets
- demonstrate comprehensive presentation skills using complex IT systems, showing creativity and a depth of knowledge and understanding of the subject
- demonstrate an effective use of botanical plant names, and will give well-chosen examples and use technical terms throughout the work that they present.

For merit standard, learners will:

- produce well-organised factsheets on at least three different techniques of vegetative and seed propagation that describe characteristics of the techniques. The factsheets will contain accurate information on completing tasks
- reference some of the factors that influence the selection of the methods detailed in their factsheets
- show robust presentation skills using IT systems, or they will organise information in an eye-catching format
- demonstrate some evidence of botanical and technical terms throughout.

For pass standard, learners will:

- produce basic factsheets that identify the characteristics of at least three different techniques used for vegetative and seed propagation methods
- outline some of the factors that influence the selection of the methods detailed in their factsheets
- make reference to plant names with some use of relevant technical terms.

Learning aim B

For distinction standard, learners will:

- demonstrate competence when selecting and preparing materials for vegetative propagation, with total awareness of their surroundings
- confidently prepare material ensuring uniformity and full use of the selected container
- apply robust knowledge and understanding when selecting seeds for propagation
- skilfully prepare suitable seed trays/containers in a logical way; they will sow seeds ensuring uniformity and cover correctly
- follow excellent hygiene practices throughout the propagation tasks
- show initiative during propagation tasks, making realistic and appropriate decisions where required, and demonstrating full use of the materials gathered and seeds used.

For merit standard, learners will:

- demonstrate effective skills when selecting and preparing materials for vegetative propagation, with awareness of their surroundings
- effectively prepare material ensuring good uniformity and effective use of the selected container
- select seeds for propagation and prepare suitable seed trays/containers. They will sow seeds evenly and cover correctly
- follow good hygiene practices throughout the propagation tasks
- show effective skills throughout the propagation tasks, making appropriate decisions where required.

For pass standard, learners will:

- carry out appropriate selection and preparation of materials for vegetative propagation, with minimal support and some awareness of their surroundings
- prepare materials as shown with some uniformity seen and appropriate use of the given container
- use seeds given for propagation and prepare suitable seed trays/containers. They will demonstrate basic sowing skills and cover correctly
- show awareness of good hygiene practices throughout the propagation tasks
- show developing skills throughout the propagation tasks.

Learning aim C

For distinction standard, learners will:

- work independently to carry out monitoring of propagated plants, meeting their needs effectively
- demonstrate robust skills when providing the effective aftercare required for propagated plants, showing full awareness of the requirements for plants to be successful
- clearly document tasks by keeping accurate records of activities, including timings, botanical plant names, growing media used, date, quantities and success rates.

For merit standard, learners will:

- show independence when carrying out monitoring of propagated plants to meet their needs appropriately
- demonstrate skills when providing the ongoing aftercare required for propagated plants, showing an awareness of the growing requirements of the plants
- keep detailed records of tasks, including timings, plant names, growing media used, date, quantities and success rates.

For pass standard, learners will:

- carry out basic monitoring of propagated plants and meet their needs with minimal support
- show developing skills when providing the basic aftercare for propagated plants, recalling the growing requirements needed
- keep basic records of tasks, including timings, plant names, growing media used, date, quantities and success rates.

Assessment activity

The summative assessment activity takes place after learners have completed their formative development. The activity should be practical, be set in a realistic scenario and draw on learning from the unit, including the transferable skills. You will need to give learners a set period of time and number of hours in which to complete the activity. *Section 6* gives information on setting assignments and there is further information on our website.

A suggested structure for summative assessment is shown in the *Unit summary* section, along with suitable forms of evidence. This is for illustrative purposes only and can therefore be adapted to meet local needs or to assess across units where suitable opportunities exist. The information in the *Links to other units* section will be helpful in identifying opportunities for assessment across units.

The following scenario could be used to produce the required evidence for this unit. Centres are free to use comparable scenarios or other forms of evidence provided that they meet the assessment requirements of the unit.

Suggested scenario

Your centre is having an open day and will be selling a range of plants. You have been asked to look through some seed catalogues given to you by your tutor and choose three different plants to grow from seed that will be ready to sell. You have also been asked to propagate plants via vegetative methods and grow them into saleable small plants for the day. You will need to plan and carry out all propagation tasks as well as provide aftercare and work safely. Your tutor would also like you to produce propagation factsheets that can be handed out on the day to customers or potential new students, which will encourage them to grow their own plants. While carrying out your propagation tasks you will be observed by your tutor who will be assessing your skills and knowledge.

If a retake is necessary, an alternative example must be used. The following is an example of a retake assessment activity.

Different plants will be selected to be grown from seed and cuttings.

Further information for tutors and assessors

Delivery guidance

The following are examples of practical activities and workshops that tutors could use when developing sector and transferable skills in the delivery of this unit. Wherever possible, practical activities should be used to help learners develop both personal and sector skills in preparation for the final assessment. These suggestions are not intended as a definitive guide to cover the full GLH of the unit.

Introduction to unit Tutors will introduce the topic of vegetative and seed propagation, directing learners to discuss, in small groups, their own knowledge of the subject and then sharing this with the class. Tutors will bring examples of vegetative material to demonstrate different techniques of propagating plants via various methods, and to discuss the tools and equipment required. Tutors will show videos of seed-sowing techniques for different plant types, including annual, biennial, herbaceous, perennial plants and vegetables, and discuss the tools and equipment required. Tutors will introduce propagation areas, and learners will assess how these areas meet the requirements of cuttings and germination. **Suggested time:** about 4 hours.
Activity: Vegetative propagation activity Tutors will bring examples of vegetative materials to demonstrate different techniques, including those listed in the unit content. Tutors will also bring in examples of plants that are of both suitable and non-suitable stock plant material, so that learners can compare and discuss the reasons why some are suitable and others are not. This could include flowering stock, diseased material, young healthy stock, mature healthy stock. Tutors will bring unlabelled examples of growing media, including pre-mixed compost, peat-free compost and own-mixed compost to enable learners to discuss the contents and merits of each before deciding which would be suitable for their own practical tasks and why. **Suggested time:** about 6 hours.
Activity: Seed propagation activity Tutors will bring in examples of different seed types, including untreated, pelleted, coated and treated seed, and a range of sizes from very large seed to very small. Tutors will introduce ways of buying seed, for example buying cheaply from a local shop or buying seed in bulk from seed suppliers. This could be linked to a class trip to a large seed supplier where experts could show their facilities and how seed ends up with the grower. Learners could also be encouraged to collect their own seed and investigate the preparation and storage requirements of their collected seed. Learners will research seed varieties and make selections for practical seed-sowing lessons. **Suggested time:** about 8 hours.
Activity: Practical vegetative propagation Tutors will demonstrate skills required before observing learners carrying out practical vegetative propagation, starting with assessing the risks of the task, selecting the correct tools and equipment, and preparing the growing area and growing media. Learners will be directed to select their own stock to suit the type of propagation being carried out before preparing the stock correctly and evenly. Learners will complete their tasks by correctly labelling propagated plants and providing the relevant aftercare, which could include watering, heat, light or protection. **Suggested time:** about 6 hours.

Activity: Practical seed propagation

Learners will use their own selected seed for this activity. Tutors will demonstrate the skills required before observing learners carrying out practical seed propagation, starting with assessing the risks of the task, selecting the correct tools and equipment, and preparing the growing area. Learners will be directed to prepare seed trays correctly and clear areas ready to sow with an even broadcast of seed. Learners will complete their tasks by correctly labelling seed and providing relevant aftercare, which could include watering, heat, light or protection.

Suggested time: about 6 hours.

Essential resources

For this unit, learners will need access to:

- a range of stock plants and seed
- propagation areas, which could be inside or outside
- tools, equipment and resources listed in the unit content.

Links to other units

This unit has strong links to:

- Unit 1: Introduction to Working in Land-based Industries
- Unit 2: Introduction to Plant and Soil Science.

Employer involvement

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

- guest speakers
- work experience
- visits to seed companies.

Unit 6: Establish and Maintain Plants and Seeds

Level: **2**

Unit type: **Optional**

Assessment type: **Internal**

Guided learning hours: **30**

Unit in brief

Learners will develop an understanding of correct planting times, planting requirements and initial maintenance and the skills to successfully establish and maintain plants and seeds.

Unit introduction

Being able to establish plants and seeds is key to their successful growth whether they are container-grown shrubs, bare-root trees, turf, seedlings or sown seeds. Understanding what is needed to establish plants and seeds will ensure that they have the best start possible.

In this unit, you will build on the knowledge developed in *Unit 2*: *Introduction to Plant and Soil Science* to explore plant requirements, including timings, environment, aspect, soil and the need for water and nutrients. You will learn how to plan initial maintenance requirements, which will include planting, pruning, support, weeding and inspection for basic health problems, including pests, diseases and disorders. You will then carry out practical establishment and maintenance tasks of plants, following your plan.

Whether you decide to move into work, progress to a Level 3 qualification or to an Apprenticeship as a gardener in the grounds of an estate, a landscape gardener or operative, a greenkeeper or groundsperson, understanding how to establish and maintain plants and seeds to ensure their success will be an advantage in your role.

Learning aims

In this unit you will:

A Explore the initial requirements of plants and seeds to ensure successful establishment

B Plan the maintenance of newly established plants and seeds

C Be able to establish new plants and seeds and carry out planned maintenance tasks.

Unit summary

Learning aim	Key teaching areas	Summary of suggested assessment evidence
A Explore the initial requirements of plants and seeds to ensure successful establishment	**A1** Plant and seed types **A2** Soil type	A presentation on plant requirements for successful establishment. A maintenance plan for newly established plants or seeds. A portfolio of evidence that includes evidence of: • establishment and maintenance tasks being carried out • following own maintenance plan.
B Plan the maintenance of newly established plants and seeds	**B1** Importance of planning and factors to consider **B2** General maintenance tasks	
C Be able to establish new plants and seeds and carry out planned maintenance tasks	**C1** Planting, initial aftercare and maintenance	

Key teaching areas in this unit include:

Sector skills	Knowledge	Transferable skills/behaviours
• Tools and equipment use • Presentation skills • Plant or seed establishment, initial aftercare and maintenance • Working safely	• Plant and seed types and their requirements for planting • Planning of maintenance for newly established plants or seeds • Inspections for basic health problems	• Preparing for work • Managing information

Unit content

Knowledge and sector skills

Learning aim A: Explore the initial requirements of plants and seeds to ensure successful establishment

A1 Plant and seed types

Learners will develop an understanding of a range of different types of plant and seed, and identify at least three from each category using common and Latin names. This understanding will include when to establish the plants and seeds to ensure successful growth.

- Plant and seed types, and their growing characteristics, to include:
  - shrubs – multi-stemmed plants with permanent structures
  - conifers – trees that have needle or scale-like leaves and which generally bear cones
  - trees – perennial plants that grow tall and have a single stem/trunk
  - hedging – plants that have dense growth and can withstand hard pruning
  - herbaceous perennials – plants with outer woody stems that die to the ground at the end of the growing season and return the following spring
  - annuals – plants that complete their life cycles in one growing season
  - biennials – plants that take two growing seasons to complete their life cycle; in the first they produce vegetative growth, then flower in the second
  - turf grass – short, narrow-leaved, close-knit plants, cultivated for lawn areas.
- When to establish plants and seeds:
  - time of year to establish different types of plant, during dormant months October to March for bare root and root-balled plants, most of the year for container-grown, avoiding height of summer due to watering requirements
  - when to sow seeds – from January with protection, March/April outside and depending on type of plant being sown, pricking out and transplanting seedlings outside after risk of frosts has gone in late May/June
  - environmental considerations, including climate of area, position for space and light, aspect including warmth of south facing or cool north facing.
- Initial requirements for plants, including:
  - protection – from cold weather or animal guards
  - support needs of plant, including stakes, canes, ties
  - irrigation – watering requirements after planting
  - nutrients – organic matter in soil, base dressing, top dressing.

A2 Soil type

Learners will develop an understanding of how to identify different soil types and link them to different types of plants and their requirements, in order to establish them successfully.

- Soil types and their characteristics:
  - sand – characteristics include free draining, large particles, feels gritty, warms quickly, no shrinkage, lighter in colour
  - silt – characteristics include fertile soil, feels soapy, medium particles, holds moderate amounts of water, sometimes hard to drain
  - clay – characteristics include heavy when wet, prone to waterlogging, forms clods, poor aeration, holds on to nutrients, feels sticky when wet, shrinks when dry
  - loam – characteristics include equal parts sand, silt and clay.

- Matching soil type and characteristics to plant requirements for establishment, including:
  - free-draining for plants that do not like to sit in water
  - holds water for plants that prefer wetter conditions
  - nutrient rich for short-lived flowering plants
  - ericaceous soil for lime haters.

Learning aim B: Plan the maintenance of newly established plants and seeds

B1 Importance of planning and factors to consider

Learners will develop an understanding of the importance of planning maintenance, methods that can be used and essential points that should be included in their plans.

- Why planning maintenance of plants or seeds is important, including:
  - health and vigour – regular health checks required to identify problems early, including pests, diseases, disorders
  - aesthetics – making sure area looks good and is free of litter, waste, fallen leaves, twigs/branches, weeds
  - staff – allocation of jobs so it is known who is completing which task so that the task does not get repeated, planning when someone is away from work so that jobs are still completed
  - timing – information on when and how often tasks take place.
- Planning methods, including: using wall planner, online or paper diary, calendar, chart, spreadsheets.
- Planning for maintenance, tasks on the plan to include:
  - tasks to be completed, using those listed in B2
  - weekly timings and frequency of tasks
  - seasonal impacts, including frequent pruning/deadheading, intensive mowing, watering during summer, feeding during growing seasons
  - contingencies, including poor weather, staff absence.
- Risk assessment of the tasks being carried out.

B2 General maintenance tasks

Understanding the regular maintenance tasks required to keep plants healthy, the appropriate application methods and adding relevant tasks to the maintenance plan.

- Watering, including watering can, hose and lance, sprinklers.
- Feeding, including base dressing, top dressing, slow release, liquid feed.
- Pruning, trimming, thinning.
- Support: using stakes, canes, frame, ties, guards.
- Removal of weeds by hand, hand tools.
- Inspection for basic health problems and identification, including:
  - pests, including aphids, moles, slugs
  - diseases, including mould, rust, fungi
  - disorders, including nutrient deficiency, machinery damage, waterlogging, drought, looking for damage to area and plants, including man-made damage.

Learning aim C: Be able to establish new plants and seeds and carry out planned maintenance tasks

C1 Planting, initial aftercare and maintenance

Plant and seed requirements of those being established from planting to initial aftercare, and following planned maintenance tasks related to the time of year to ensure successful establishment.

- Tools and equipment required for planting and maintenance tasks, including:
  - trowel, spade, rake, hoe, fork, secateurs, wheelbarrow.
- Planting or seed-sowing requirements, including:
  - planting positions of given plants or seeds, required depth, space to grow, suitable backfill or covering medium to suit plant or seed.
- Providing initial aftercare for plants being established, including:
  - water, nutrients, support
  - providing protection from weather, damage or predators.
- Following own maintenance plan designed for regular and continued maintenance of the plants or seeds established.

Transferable skills

Preparing for work

- Demonstrate appropriate planning for establishment and maintenance of new plants.
- Apply knowledge and understanding when designing a planning document.
- Be able to show awareness of health and safety hazards, and risks.
- Be able to exhibit qualities and attributes required while working practically.

Managing information

- Organise information in maintenance planning document.
- Present information on plant and seed requirements for establishment and maintenance in an organised way.
- Follow maintenance plan when working practically.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Explore the initial requirements of plants and seeds to ensure successful establishment		
A.P1 Identify the growing characteristics of specific plant and seed types.	**A.M1** Describe the growing requirements for specific plants and seeds, with reference to appropriate soil type and maintenance needs.	**A.D1** Describe the growing requirements for specific plants and seeds, comparing and contrasting soil types and maintenance needs.
A.P2 Identify the characteristics of soil types when establishing plants and seeds.		
Learning aim B: Plan the maintenance of newly established plants and seeds		
B.P3 Produce a basic plan for the maintenance of newly established plants and seeds.	**B.M2** Produce a detailed plan for the maintenance of newly established plants and seeds.	**B.D2** Produce a detailed plan for the maintenance of newly established plants and seeds, evaluating the effectiveness of the plan and making changes where appropriate.
Learning aim C: Be able to establish new plants and seeds and carry out planned maintenance tasks		
C.P4 Carry out basic planting, initial aftercare and maintenance of newly established plants and seeds.	**C.M3** Competently carry out planting, initial aftercare and planned maintenance of newly established plants and seeds.	**C.D3** Confidently and competently carry out planting, effective initial aftercare and planned maintenance of newly established plants and seeds.

Essential information for assessment decisions

Learning aim A

For distinction standard, learners will:

- accurately describe the growing requirements of plants and seeds to ensure successful establishment
- demonstrate the various characteristics of soil that may affect successful establishment of plants and seeds
- prepare complex information on plant and soil requirements for successful establishment, selecting appropriate IT formats that show creativity and skill
- demonstrate confident and robust links to learning, using botanical plant names and technical terms throughout their work with a full understanding of their meaning
- compare and contrast soil types and maintenance requirements of plants and seeds.

For merit standard, learners will:

- describe the growing requirements of plants and seeds for successful establishment
- demonstrate understanding of the key characteristics of soil for successful establishment of plants and seeds
- prepare their information, using appropriate IT formats
- evidence the use of botanical names and technical terms
- compare some soil types to the growing requirements of plants and seeds.

For pass standard, learners will:

- describe some of the growing requirements of plants and seeds for successful establishment
- show basic knowledge of soil characteristics for establishing plants and seeds
- prepare their work using an appropriate format, with accurate plant names and some basic evidence of using botanical names and terminology
- be able to make basic recommendations for improvements in future work.

Learning aim B

For distinction standard, learners will:

- show a depth of knowledge when designing a monthly maintenance plan for newly established plants and seeds
- present a maintenance plan, using an appropriate format, showing the ability to consider others who may need to share or change the plan
- include detailed information on all aspects of maintenance required, resources requirements and tasks, which will be accurate for the time of year
- evaluate the effectiveness of maintenance tasks and change plans accordingly.

For merit standard, learners will:

- show knowledge and understanding when producing a detailed plan for the maintenance of newly established plants
- demonstrate that they have fully considered the format of the plan and have included all maintenance tasks accurately
- demonstrate understanding of plant requirements for maintenance
- review maintenance tasks and recommend future improvements.

For pass standard, learners will:

- produce a basic maintenance plan for newly established plants, presented in an easy-to-follow, logical format
- include a range of basic tasks and accurately show the months in which they are to be completed
- show developing skills in assessing own tasks.

Learning aim C

For distinction standard, learners will:

- apply robust knowledge and understanding when following their maintenance plan for newly established plants and seeds
- work independently to select correct tools and equipment for their task
- work competently and safely, and show initiative and flexibility if problems arise
- demonstrate skills confidently while working and fully consider the environment around them.

For merit standard, learners will:

- apply knowledge and understanding when following their maintenance plan for newly established plants and seeds
- work independently in the main, showing knowledge of correct tools and equipment linked to tasks
- work safely and show the ability to adapt if plans change
- show developing skills and be aware of the environment around them.

For pass standard, learners will:

- be able to recall information and follow their maintenance plan for newly established plants and seeds
- demonstrate some independence where they can recall the correct tools and equipment required for the tasks they are directed to complete
- follow health and safety advice and change task if plans change
- demonstrate basic skills in practical tasks and have some awareness of the environment around them while they work.

Assessment activity

The summative assessment activity takes place after learners have completed their formative development. The activity should be practical, be set in a realistic scenario and draw on learning from the unit, including the transferable skills. You will need to give learners a set period of time and number of hours in which to complete the activity. *Section 6* gives information on setting assignments and there is further information on our website.

A suggested structure for summative assessment is shown in the *Unit summary* section, along with suitable forms of evidence. This is for illustrative purposes only and can therefore be adapted to meet local needs or to assess across units where suitable opportunities exist. The information in the *Links to other units* section will be helpful in identifying opportunities for assessment across units.

The following scenario could be used to produce the required evidence for this unit. Centres are free to use comparable scenarios or other forms of evidence provided that they meet the assessment requirements of the unit.

Suggested scenario

You have been asked to supervise a group of work-experience students who are coming to spend two weeks working in the estate gardens where you are a gardener. You have been given a project of renovating an area of ground, which will include establishing new plants and carrying out maintenance. You have also been asked to prepare a maintenance plan for the students to follow during their time with you.

If a retake is necessary, an alternative example must be used. The following is an example of a retake assessment activity.

Establishing new plants and carrying out maintenance in a different area of the grounds.

Further information for tutors and assessors

Delivery guidance

The following are examples of practical activities and workshops that tutors could use when developing sector and transferable skills in the delivery of this unit. Wherever possible, practical activities should be used to help learners develop both personal and sector skills in preparation for the final assessment. These suggestions are not intended as a definitive guide to cover the full GLH of the unit.

Introduction to unit Tutors will introduce a range of different plant types, with named examples that include shrubs, conifers, trees, hedging, herbaceous, annuals, biennials and grass, and ensure that learners know the types of plants they will be working with. Learners will then look at plants to establish and carry out investigations, which will include times of the year for successful establishment and the environmental requirements of plants chosen. **Suggested time:** about 6 hours.
Activity: Investigating soil types Tutors will discuss soil types and bring examples of these into the classroom for learners to carry out hand-texturing activities. Tutors will identify areas where learners will carry out practical activities so that they can investigate their own soil and be able to determine the soil type in their own planting areas. Learners will then investigate plants already chosen to ensure they are suited to the area given. **Suggested time:** about 6 hours.
Activity: Planning maintenance tasks Tutors will show examples of planning documents, including written and electronic versions. Tutors will then discuss the importance of planning and the types of maintenance required, which will include: watering, feeding, pruning, providing support, removal of weeds and basic health inspections. Learners will create a maintenance plan for their given area, which shows tasks, timings, frequency, seasonal requirements and contingencies. **Suggested time:** about 6 hours.
Activity: Practical establishment and initial maintenance tasks Tutors will demonstrate establishment and maintenance tasks, introducing the tools and equipment required and demonstrating their correct use. Learners will demonstrate safe working practices, carry out planting to correct depths and spacing to establish new plants, and carry out initial maintenance, which could include watering, feeding and protection. Tutors will observe learners working practically. **Suggested time:** about 8 hours.
Activity: Practical maintenance tasks Learners will follow their maintenance plan for newly established plants, completing tasks safely and relevant to the time of year detailed on their plans. Tasks could include watering, feeding, pruning, providing support, removal of weeds and basic health inspections. Tutors will observe learners working practically. **Suggested time:** about 4 hours.

Essential resources

For this unit, learners will need access to:

- areas to establish new plants and carry out maintenance
- tools and equipment for establishment and maintenance tasks.

Links to other units

This unit has strong links to:

- Unit 1 Introduction to Working in Land-based Industries
- Unit 2: Introduction to Plant and Soil Science.

Employer involvement

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

- guest speakers
- visits to parks and gardens
- support from local business staff as mentors.

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

Unit 7: Nursery Stock Production

Level: **2**

Unit type: **Optional**

Assessment type: **Internal**

Guided learning hours: **30**

Unit in brief

Learners will develop the practical skills in, and understanding of, the production and preparation of hardy ornamental nursery stock for its ultimate sale.

Unit introduction

Working in horticulture gives you the opportunity to help improve our environment. Imagine living in a world without flowers, shrubs and trees. These are all provided by the many nursery-stock producers across the country.

In this unit, you will learn about the different types of plants grown and the way they are produced to meet the needs of the customer, including garden owners, local authorities and landowners. You will learn how to spot when plants require attention so that you can give them what they need. This will include shaping and spacing plants so that they are of a high quality. You will also be involved at the end of the process, selecting and preparing plants for their final sale to the customer. This is a very important stage and has a great impact on the reputation of the nursery.

This unit will draw on many of the principles learned in other units in this qualification, and you will be able to apply them to real-life situations to help prepare you for the exciting world of work in plant production.

Learning aims

In this unit you will:

A Understand plant specifications and their suitability to meet customer needs

B Maintain the growth of nursery stock

C Collect and prepare plants for despatch.

Unit summary

Learning aim	Key teaching areas	Summary of suggested assessment evidence
A Understand plant specifications and their suitability to meet customer needs	**A1** Types of nursery stock **A2** Plant specifications supplied to the customer **A3** Customer requirements	An identification test and scenarios to match requirements to production types.
B Maintain the growth of nursery stock	**B1** Maintain plant health **B2** Apply materials to support plant growth **B3** Manage plant development	A portfolio of practical evidence, demonstrating the practical skills required for managing nursery stock and its preparation for sale. Completed despatch documentation.
C Collect and prepare plants for despatch	**C1** Collect and transfer plants to despatch point **C2** Quality control of plants **C3** Ensure despatch documentation is completed	

Key teaching areas in this unit include:

Sector skills	Knowledge	Transferable skills/behaviours
• Identification of plant types • Identification of production formats • Plant maintenance and shaping • Plant handling • Quality control • Safe working methods	• Common plant specifications • Customer requirements • Requirements for plant growth • Fertiliser formulation • Safe transportation methods	• Communication • Working with others • Thinking skills/adaptability • Problem solving • Managing information • Self-management and development

Unit content

Knowledge and sector skills

Learning aim A: Understand plant specifications and their suitability to meet customer needs

A1 Types of nursery stock

- Understand the range of common types of nursery stock, including:
  - herbaceous perennials
  - ornamental grasses
  - alpines
  - ferns
  - shrubs
  - trees
  - climbing plants.

A2 Plant specifications supplied to the customer

- Understand the common specification formats available, including:
  - young plants, e.g. liners, plugs
  - container grown, e.g. P7, P9, 1 litre, 3 litre, 5 litre, 10 litre
  - open ground, e.g. bare root, root balled, containerised
  - tree size, e.g. seedling, transplant, whip, feathered, half standard, standard, heavy/extra-heavy standard, semi-mature.

A3 Customer requirements

- Recognise and be able to describe the different needs and priorities of customers:
  - planting all year round versus dormant-season planting: willingness to pay a price premium for the convenience of container-grown stock
  - size versus cost: comparison of different plant sizes and the costs of production, size of customer's budget
  - creating instant impact: willingness to pay a price premium for a more instant impact with semi-mature plants.

Learning aim B: Maintain the growth of nursery stock

B1 Maintain plant health

- Maintenance of growing conditions to ensure good health in plants, including:
  - hygiene
  - sufficient moisture for plant species
  - nutrient levels for plant species.
- Monitor pest, disease and environmental damage.

B2 Apply materials to support plant growth

- Materials supplied to meet the needs of the crop:
  - supply irrigation
  - provide nutrients.
- Liquid and solid fertilisers:
  - provide plant protection against natural and environmental damage.
- Protective plant coverings, e.g. frost protection.
- Pest or disease control.

B3 Manage plant development

- Use a range of techniques to facilitate healthy plant growth, such as:
  - plant spacing
  - formative training
  - providing plant support
  - dealing with unwanted growth (pruning, trimming)
  - disposal of unwanted plant material.

Learning aim C: Collect and prepare plants for despatch

C1 Collect and transfer plants to despatch point

- Selection/lifting plants from growing area: selection according to specification and trueness to type, lifting plants minimising damage to roots and/or shoots.
- Transport efficiently to despatch area within an acceptable timescale.
- Minimise damage: provision of water and shade; protection from frost, intense sunlight and winds.

C2 Quality control of plants

- Apply appropriate processes while preparing plants for despatch, to include:
  - grade out poor quality
  - remove weeds/damaged leaves
  - clean pots
  - protect root ball (for non-container stock)
  - label.

C3 Ensure despatch documentation is completed

- Despatch documentation, to include:
  - correct numbers
  - name of plants
  - correct date
  - delivery address
  - other important instructions, such as number of pallets/trolleys used for exchange.

Transferable skills

Communication

- Verbal communication is appropriate in the practical situation, communication in writing is clear and accurate.

Working with others

- Collection of materials, lifting of heavier items, consideration of others while working.

Thinking skills/adaptability

- Adapting knowledge to meet the needs of the plant or the customer, ensuring end product is of a high quality.

Problem solving

- Using information obtained to meet plants' needs.

Managing information

- Selects and applies appropriate information, e.g. the picking list for a customer order.
- Documentation is completed accurately and processed appropriately.

Self-management and development

- Completes tasks on time, reviews performance.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Understand plant specifications and their suitability to meet customer needs		
A.P1 Correctly describe types of nursery stock presented.	**A.M1** Describe the types of nursery stock and plant specifications selected to meet customer requirements.	**A.D1** Compare and contrast types of nursery stock and plant specifications selected to meet different customer requirements, justifying how these needs have been met.
A.P2 Correctly describe specifications for nursery stock.		
A.P3 Identify customer requirements of nursery stock.		
Learning aim B: Maintain the growth of nursery stock		
B.P4 Identify maintenance needs for selected nursery-stock plants with some reference to plant requirements.	**B.M2** Competently carry out inspection, management and maintenance of selected nursery-stock plants, with reference to specific plant requirements.	**B.D2** Confidently and competently carry out appropriate inspection, management and maintenance of selected nursery-stock plants in a timely and cost-effective manner, to commercial standards.
B.P5 Carry out basic maintenance to support plant growth.		
Learning aim C: Collect and prepare plants for despatch		
C.P6 Carry out basic preparation and handling skills when transporting stock to the despatch area.	**C.M3** Carry out competent stock handling and effective processing of the selected nursery stock, fulfilling customer orders accurately and providing necessary documentation to support the completed consignment.	**C.D3** Confidently and competently carry out preparation and stock handling, presenting plants to industry standards, and independently completing despatch documentation to support consignment without errors.
C.P7 Grade and accurately present plants according to specification.		
C.P8 Complete documentation with basic information to accompany the consignment.		

Essential information for assessment decisions

Learning aim A

For distinction standard, learners will:

- show a comprehensive understanding of the different types of nursery stock, and the similarities and differences that exist between a minimum of five specification formats available for meeting customer needs, for example: time of year for planting, the relative cost, or the desire for instant impact.

For merit standard, learners will:

- describe the use of specific specification formats for at least five different types of nursery stock presented, and how these meet customer needs, for example: time of year for planting, the relative cost, or the desire for instant impact.

For pass standard, learners will:

- identify a minimum of 10 types of nursery-stock plant
- list the types of specification format used to meet customer needs, e.g. container grown, open ground etc. (If container grown, the size/format of the pot must be cited)
- state the advantages of each specification type presented for meeting customer needs.

The range must include at least five different 'types' as listed in teaching area A1 and at least five different 'specifications' as listed in teaching area A2. These may include different container sizes.

Learning aim B

For distinction standard, learners will:

- carry out a detailed inspection of the selected plant stock, providing a comprehensive report on the management and maintenance required, and justifying outcomes in terms of whether it is cost-effective and the required standards
- carry out appropriate maintenance, e.g. amounts of water, nutrients and (non-chemical) plant protection and management, to include spacing, plant support and waste removal based on report outcomes, justifying the selection with reference to specific plant requirements.

For merit standard, learners will:

- Inspect and report on the status of nursery plant stock, ensuring the report is tailored to the specific nature of the stock under production. The report will accurately identify pest, disease and environmental issues where present
- act on the outcomes of the report by ensuring the stock is maintained, for example: amounts of water, nutrients and (non-chemical) plant protection
- space plants within a crop in a time-efficient way and within expected timescales
- train and trim the crop, remove plant waste from the area and dispose of it appropriately.

For pass standard, learners will:

- inspect a range of nursery stock within a plant-production unit and report on the moisture and nutrient status of the crops
- identify crops with pest, disease and environmental issues
- apply irrigation in a safe and appropriate way
- space plants and train the crop to meet its immediate needs. Any waste is disposed of correctly.

Learning aim C

For distinction standard, learners will:

- carry out effective preparation and stock handling
- ensure poor-quality plants within the grading process are disposed of appropriately
- present plants in the specified manner, to include: labelling in the prescribed place, attached in the prescribed way, and legible to the customer
- demonstrate the proficient use of despatch documentation, completing documentation for five different customer orders
- justify why plants have been rejected as substandard and/or give an explanation of why correct documentation is important.

For merit standard, learners will:

- ensure that stock is selected and protected during handling and transportation
- grade plants, which will include the removal of damage, ensuring plants ready for despatch are uniform
- dispose of waste in an appropriate way
- present the correct number of plants to meet the customer order, meeting appropriate quality standards
- complete documentation accurately without errors.

For pass standard, learners will:

- collect plants according to a predefined collection list (a minimum of 50 plants across three different species/cultivars)
- transport plants to the despatch point in a safe way that is suitable to the method of production
- grade and process plants, including the removal of weeds. All plants will be labelled in a format suitable for their specification
- complete documentation with mostly relevant information.

Assessment activity

The summative assessment activity takes place after learners have completed their formative development. The activity should be practical, be set in a realistic scenario and draw on learning from the unit, including the transferable skills. You will need to give learners a set period of time and number of hours in which to complete the activity. *Section 6* gives information on setting assignments and there is further information on our website.

A suggested structure for summative assessment is shown in the *Unit summary* section, along with suitable forms of evidence. This is for illustrative purposes only and can therefore be adapted to meet local needs or to assess across units where suitable opportunities exist. The information in the *Links to other units* section will be helpful in identifying opportunities for assessment across units.

The following scenario could be used to produce the required evidence for this unit. Centres are free to use comparable scenarios or other forms of evidence provided that they meet the assessment requirements of the unit.

Suggested scenario

You are working in a production nursery that supplies high-quality nursery stock to a range of customers. Your manager wants to make a promotional video to place on social media to show the work that is carried out in the nursery. You have been asked to demonstrate the range of skills that are used to supply plants to your customers, ensuring that they get a high-quality product.

If a retake is necessary, an alternative example must be used. The following is an example of a retake assessment activity.

As above but using a different range of plants.

Further information for tutors and assessors

Delivery guidance

The following are examples of practical activities and workshops that tutors could use when developing sector and transferable skills in the delivery of this unit. Wherever possible, practical activities should be used to help learners develop both personal and sector skills in preparation for the final assessment. These suggestions are not intended as a definitive guide to cover the full GLH of the unit.

Introduction to unit A discussion to understand what is classed as 'nursery stock', how it is grown and why it is important. Some nurseries have short clips on YouTube™, which will help to give an idea of the scale of some of the larger production sites. Learners will research the annual value of the nursery-stock sector. **Suggested time:** about 2 hours.
Activity: Different plants for different people Building on previous knowledge from other units, learners will discuss the different types of plants that can be grown as 'nursery stock'. Learners will produce an identification key (with yes or no responses to questions) to check their understanding. Learners will handle/evaluate a range of different production systems (bare-root or root-balled plants are only available in the dormant season so may need to be shown by pictures). Learners will produce a quiz for each other to check they can identify different pot sizes/production sizes by sight. Copies of the National Plant Specification (downloadable) will assist in defining tree sizes. Learners will list the pros and cons of different production formats (i.e. cost, availability, size) and how this might impact on the needs of a customer. **Suggested time:** about 8 hours.
Activity: Care of nursery stock Linking their knowledge from other units that cover plant care, learners will apply their knowledge to a production unit with a range of plants. They should be directed to look at the impact of spacing on growth and development (photosynthesis), the availability of water, signs of nutrient deficiency, pest or disease damage, and ways of providing solutions. Learners will take a photo record and produce a poster to show their findings. **Suggested time:** about 8 hours.
Activity: Preparing for despatch Learners will review the expected standards of nursery-stock plants (images of good and poor examples might be useful). They will list all the different tasks and checks that should be carried out prior to plants leaving the nursery. Images/details of different specifications are available online. Using their checklist, learners will practise processing plants and getting them ready to meet specifications. They will review the quality of the finished products and identify where the process could be improved/sped up. **Suggested time:** about 8 hours.
Activity: Documentation Learners use a template form to complete the despatch details for a range of fictional customers. This will give them confidence in form filling. **Suggested time:** about 3 hours.

Essential resources

For this unit, learners will need access to:

- a sufficient range of different nursery stock within a production system to provide coverage of teaching areas A1 and A2, and in sufficient quantity to allow for learners to prepare items for despatch
- facilities to act as a despatch area for the processing of plants (although the sale itself may be simulated).

Links to other units

This unit draws on the knowledge and skills taught in:

- Unit 1: Introduction to Working in Land-based Industries
- Unit 2: Introduction to Plant and Soil Science.

This unit has strong links to:

- Unit 5: Propagation Techniques
- Unit 6: Establish and Maintain Plants and Seeds.

Employer involvement

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

- guest speakers
- design/ideas to contribute to unit assignment/case study/project materials
- work experience
- own business materials as exemplars
- support from local business staff as mentors or providers of sites to visit to see alternative production methods.

Unit 8: Maintain Sports and Amenity Turf

Level: **2**

Unit type: **Optional**

Assessment type: **Internal**

Guided learning hours: **30**

Unit in brief

Learners will develop an understanding of the requirements for maintaining sports and amenity turf. They will be able to carry out safe maintenance and keep accurate records of their tasks.

Unit introduction

Whether you are working on a golf course, in the grounds of a stately home or in a public park, ensuring turf maintenance is carried out properly and at the correct times of the year is important to its success.

In this unit, you will investigate maintenance for both sports and amenity turf and develop an understanding of different turf requirements. You will learn how to carry out regular inspections of turf, and develop the skills to identify general problems or maintenance requirements and know the importance of dealing with these promptly. You will also learn how to create and complete accurate records where you will detail the maintenance tasks completed.

Whether you decide to move to an Apprenticeship in sports turf as a greenkeeper or groundsman, or as a gardener in the grounds of a stately home or a public park, the ability to understand and carry out general turf maintenance will be a huge advantage to your role. Understanding turf requirements, planning maintenance and the ability to keep records will mean your turf will be successful to support play, recreation or look attractive for years to come.

Learning aims

In this unit you will:

A Explore the maintenance requirements for sports and amenity turf

B Plan maintenance tasks for sports or amenity turf

C Carry out maintenance on a sports or amenity turf area.

Unit summary

Learning aim	Key teaching areas	Summary of suggested assessment evidence
A Explore the maintenance requirements for sports and amenity turf	**A1** Characteristics of turf areas and grass types **A2** Maintenance requirements of sports and amenity turf	A report on the maintenance requirements of sports and amenity turf. A maintenance plan that shows the monthly maintenance for a given area of sports or amenity turf.
B Plan maintenance tasks for sports or amenity turf	**B1** Planning for the maintenance of sports or amenity turf	
C Carry out maintenance on a sports or amenity turf area	**C1** Tools and equipment used for the maintenance of sports or amenity turf **C2** Maintain turf and record tasks	A portfolio of evidence that includes: • evidence of maintenance tasks being carried out against the plan • record sheets produced and filled in after practical maintenance tasks.

Key teaching areas in this unit include:

Sector skills	Knowledge	Transferable skills/behaviours
• Machinery, tools and equipment use • Turf maintenance • Working safely	• Turf areas and types • Planning for maintenance of sports and amenity turf • Keeping records	• Managing information • Preparing for work

Unit content

Knowledge and sector skills

Learning aim A: Explore the maintenance requirements for sports and amenity turf

Learners will develop their understanding of the maintenance requirements for types of sports and amenity turf.

A1 Characteristics of turf areas and grass types

Learners will identify sports and amenity areas and the types of grass(es) related to these areas.

- Sports turf, to include: golf, football, rugby, bowls, cricket.
- Amenity turf, to include: public and private parks, residential gardens, estate gardens, recreational areas.
- Grass types suited to sports and amenity turf, including: Chewing's fescue, Browntop bent, annual meadow grass, perennial ryegrass, smooth-stalked meadow grass, slender creeping red fescue.
- Seed mixes suited for different areas, including: cutting height, ornamental/fine, shade tolerance, hard wearing.

A2 Maintenance requirements of sports and amenity turf

Learners will explore the range of maintenance tasks required to ensure turf areas remain healthy and fit for purpose.

- Regular turf maintenance tasks:
  - mowing
  - scarifying, verticutting, grooming
  - aeration
  - rolling
  - switching/brushing
  - edging
  - feeding
  - weed control
  - irrigation.

Learning aim B: Plan maintenance tasks for sports or amenity turf

B1 Planning for the maintenance of sports or amenity turf

Learners will develop the skills required to carry out an inspection of a sports or amenity turf, and the skills needed for maintenance planning.

- Inspection of turf areas: identification of regular maintenance tasks, including those to improve turf health.
- Seasonal maintenance planning to identify general weekly and monthly tasks from the list in teaching area A2 using planning documents, which could include spreadsheets, wall planners, an online or paper diary.
- Repair and renovation tasks, including:
  - patching/plugging
  - over-seeding
  - divotting
  - reseeding/returfing.

- Turf health checks and identification of common problems, including:
  - pests – moles, rabbits, chafers, leatherjackets
  - diseases – red thread, fairy rings, fusarium, anthracnose
  - disorders – machinery damage, drought, nutrient deficiency, waterlogging
  - weeds – daisies, buttercup, clover, dandelion
  - moss.

Learning aim C: Carry out maintenance on a sports or amenity turf area

C1 Tools and equipment used for the maintenance of sports or amenity turf

Learners will develop the knowledge of tools and equipment related to maintaining turf, and the skills to be able to carry out safe turf maintenance by selecting the appropriate tools and equipment for tasks.

- Pedestrian machinery, including:
  - mowers, for example rotary, cylinder, hover
  - scarifier
  - aerator.
- Ride-on machinery, including:
  - mowers
  - tractors and mounted attachments
  - gator.
- Hand tools, including:
  - rakes
  - half moon
  - spade
  - shovel
  - fork.
- Powered hand tools, including:
  - strimmer
  - handheld leaf blower.
- Working safely:
  - correct and safe use of machinery
  - identification of the hazards and risks in the work area (related to tools, equipment and people) and how risks can be minimised, including essential personal protective equipment (PPE).

C2 Maintain turf and record tasks

Learners will develop their skills in turf maintenance, following their own plans and keeping accurate records of the maintenance completed.

- Follow a maintenance plan and carry out tasks related to the area at the correct time of year:
  - work safely in the work area and minimise damage while working.
- Types of records to be kept after maintenance, including:
  - details of tasks completed
  - time of the month completed
  - machinery, tools and equipment used
  - details on health of turf maintained
  - evaluation of task and recommendations for future maintenance.

Transferable skills

Managing information

- Organise information in a maintenance planning document.
- Present information in different ways when designing, planning and creating documents.

Preparing for work

- Demonstrate appropriate planning for the maintenance of sports or amenity turf.
- Apply knowledge and understanding when designing record sheets.
- Be able to show awareness of health and safety hazards and risks.
- Be able to exhibit qualities and attributes required while working practically.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Explore the maintenance requirements for sports and amenity turf		
A.P1 Outline the characteristics of sports and amenity turf areas.	**A.M1** Describe the characteristics of sports and amenity turf areas and their maintenance requirements.	**A.D1** Analyse the characteristics of sports and amenity turf areas, comparing and contrasting the maintenance requirements needed to keep them fit for purpose.
A.P2 Outline the maintenance requirements for sports and amenity turf areas.		
Learning aim B: Plan maintenance tasks for sports or amenity turf		
B.P3 Produce a basic plan with basic reference to the maintenance requirements and timings for a specific area of a sports or amenity turf.	**B.M2** Produce a detailed monthly plan with appropriate reference to the maintenance requirements for a specific area of a sports or amenity turf.	**B.D2** Produce a well-organised monthly maintenance plan, justifying the timings and selection of tasks for a specific area of a sports or amenity turf.
Learning aim C: Carry out maintenance on a sports or amenity turf area		
C.P4 Carry out basic maintenance tasks for a specific area of sports or amenity turf.	**C.M3** Effectively carry out maintenance for a specific area of sports or amenity turf, accurately recording the tasks completed to support future maintenance.	**C.D3** Confidently carry out maintenance for a specific area of sports or amenity turf, effectively recording the tasks completed with recommendations for improvements to support future maintenance and practices.
C.P5 Record basic information on the maintenance carried out.		

Essential information for assessment decisions

Learning aim A

For distinction standard, learners will:

- demonstrate a comprehensive understanding of the types of sports and amenity turf, with reference to purpose, grass types, seed mixes and maintenance needs
- fully analyse the characteristics of sports and amenity turfs, outlining the similarities and differences between the maintenance requirements of selected examples
- demonstrate use of appropriate technical terms throughout their work.

For merit standard, learners will:

- source, select and use accurate information to demonstrate their knowledge and understanding of sports and amenity turfs, grass types and seed mixes
- describe the characteristics of sports and amenity turf and their maintenance requirements, with reference to examples
- present well-organised work using mostly technical terms where appropriate.

For pass standard, learners will:

- identify examples of sports and amenity turfs with reference to their function/purpose, grass types and seed mixes
- report on the basic maintenance requirements of sports and amenity turf
- include some use of relevant terminology.

Learning aim B

For distinction standard, learners will:

- produce an effective, well-organised year plan that shows appropriate monthly maintenance tasks for a given area of turf
- use appropriate IT formats for their plan, showing creativity and skill
- fully justify tasks for their given area and explain the reasons for the timings of tasks with a depth of knowledge of the seasonal impacts on maintenance.

For merit standard, learners will:

- produce an appropriate year plan that shows detailed monthly maintenance tasks using an appropriate IT or paper-based format that shows clear planning skills
- describe the tasks required for their given area and have a sound knowledge of the timings selected for the tasks to be carried out.

For pass standard, learners will:

- produce a basic year plan that shows monthly maintenance tasks presented in a relevant format such as: diary, wall planner, word document or spreadsheet
- demonstrate some understanding of the reasons for the maintenance tasks selected and the timings for these.

Learning aim C

For distinction standard, learners will:

- select and use appropriate tools and equipment for the selected tasks
- show initiative while carrying out maintenance tasks, making realistic and appropriate decisions where required, demonstrating a flexible approach to working practically
- demonstrate a high standard of skill and a total awareness of the environment around them, and the ability to leave their areas well presented with all waste disposed of correctly
- work independently and show robust health and safety awareness throughout all practical tasks by being able to identify and minimise risks to self and others
- keep detailed records of their maintenance tasks using an appropriate format
- give clear and accurate details of the tasks completed, including accurate timings, details of machinery, tools and equipment used, information on the health of the turf, and a full evaluation of the tasks completed with recommendations for future maintenance.

For merit standard, learners will:

- work practically on maintenance tasks for a given area of sports or amenity turf, selecting and using the correct tools
- demonstrate some independence and decision making while working practically and completing all tasks with appropriate application of skills
- be aware of health and safety while working and be able to identify the majority of risks involved
- have a good understanding of how to minimise risks to self and others
- complete detailed records of their maintenance
- record appropriate details of the tasks completed, including timings, details of machinery, tools and equipment used, information on the health of the turf maintained, and an evaluation of tasks with some recommendations for future maintenance.

For pass standard, learners will:

- work practically on maintenance tasks for a given area of sports or amenity turf, using the correct tools and equipment with some support where required
- complete all basic maintenance tasks with appropriate skill and contribute to some decision making
- demonstrate awareness of health and safety and be able to identify some ways to minimise risk to themselves with minimal support
- complete a record of their maintenance tasks, including timings, machinery, tools and equipment used, and information on the health of the turf after maintenance.

Assessment activity

The summative assessment activity takes place after learners have completed their formative development. The activity should be practical, be set in a realistic scenario and draw on learning from the unit, including the transferable skills. You will need to give learners a set period of time and number of hours in which to complete the activity. *Section 6* gives information on setting assignments and there is further information on our website.

A suggested structure for summative assessment is shown in the *Unit summary* section, along with suitable forms of evidence. This is for illustrative purposes only and can therefore be adapted to meet local needs or to assess across units where suitable opportunities exist. The information in the *Links to other units* section will be helpful in identifying opportunities for assessment across units.

The following scenario could be used to produce the required evidence for this unit. Centres are free to use comparable scenarios or other forms of evidence provided that they meet the assessment requirements of the unit.

Suggested scenario

You are an apprentice greenkeeper on a nine-hole woodland golf course. You are six months into your apprenticeship when the head greenkeeper asks you to plan the monthly maintenance requirements and timings for the course. They have asked you to research the maintenance requirements and would like this presented in a chart or table and discussed with them on completion. You will then carry out maintenance tasks correctly and safely that correspond to the correct month, and keep records of the tasks completed, making suggestions for future improvements.

If a retake is necessary, an alternative example must be used. The following is an example of a retake assessment activity.

You will plan the maintenance and carry out practical tasks on a different area of turf.

Further information for tutors and assessors

Delivery guidance

The following are examples of practical activities and workshops that tutors could use when developing sector and transferable skills in the delivery of this unit. Wherever possible, practical activities should be used to help learners develop both personal and sector skills in preparation for the final assessment. These suggestions are not intended as a definitive guide to cover the full GLH of the unit.

Introduction to unit Learners will be introduced to the differences between sports and amenity turf, looking at golf, football, rugby, bowls, cricket, public and private parks, residential gardens, estate gardens and recreational areas. Tutors will discuss how often maintenance requirements need to be carried out. This could involve contributions from guest speakers such as greenkeepers, groundsmen or estate gardeners. Learners will be introduced to different grass species and learn the types suitable for different areas and applications, including different cutting heights, ornamental/fine turf, shade tolerance and hard wearing. **Suggested time:** about 6 hours.
Activity: Health of turf Tutors will introduce learners to common health problems in turf. They will set up regular identification tasks through the unit, which could include pictures, videos or examples either on site or in the classroom. Learners will be able to identify: pests – moles, rabbits, chafers, leatherjackets; diseases – red thread, fairy rings, fusarium, anthracnose; disorders – machinery damage, drought, nutrient deficiency, waterlogging; weeds – daisies, buttercup, clover, dandelion and moss; and they will link all of these with the types of maintenance required. **Suggested time:** about 6 hours.
Activity: Maintenance requirements of turf Tutors will introduce learners to an area of sports or amenity turf for them to investigate its maintenance requirements. They will carry out an inspection of the area, looking at its health and maintenance requirements. This will include mowing, scarifying/verticutting/grooming, aeration, rolling, switching/brushing, edging, feeding, weed control, irrigation, repair or renovation requirements, health checks and the timing and frequencies of these tasks. Learners will then produce a maintenance plan that matches the given area of turf. **Suggested time:** about 8 hours.
Activity: Practical maintenance of turf Tutor-guided sessions on the procedure and practices used to prepare tools and machinery for safe use during practical tasks, including pre-start checks, identification of hazards, safe working methods, correct cleaning and storage. Learners will be shown how to operate all machinery correctly and carry out checks that will form part of their observation. Following successful operation of machinery lessons, learners will carry out maintenance tasks on their given area of turf. They will complete risk assessments beforehand and select and use the correct tools, machinery and equipment relevant for the task. **Suggested time:** about 8 hours.

Activity: Record keeping

Tutors will discuss the types of records that need to be kept, showing examples of these and asking learners to evaluate them. Learners will then create their own record sheet when completing practical tasks, using the observation feedback from tutors to fill them in, and make recommendations for future maintenance tasks.

Suggested time: about 2 hours.

Essential resources

For this unit, learners will need access to:

- sports or amenity turf areas where learners can work practically
- a range of tools, equipment and machinery to complete maintenance tasks.

Links to other units

This unit has strong links to:

- Unit 1: Introduction to Working in Land-based Industries
- Unit 4: Land-based Machinery Operations.

Employer involvement

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

- guest speakers
- design/ideas to contribute to unit assignment/case study/project materials
- work experience
- own business materials as exemplars.

Unit 9: Establish and Maintain Soft Landscapes

Level: **2**

Unit type: **Optional**

Assessment type: **Internal**

Guided learning hours: **30**

Unit in brief

Learners will develop the practical skills needed to establish and maintain ornamental plants outdoors, and an understanding of how these skills can be utilised in an industrial environment.

Unit introduction

Soft landscaping is the science and art of growing ornamental plants. The UK horticulture industry is getting bigger and there are opportunities for people from all ages and backgrounds to make a difference in the quality of life of the whole community.

In this unit, you will be introduced to the practices of soft landscaping and the skills and knowledge needed by those entering the horticulture industry. You will develop the practical skills needed to clear and prepare the ground using different tools and equipment, and learn how to successfully establish a range of ornamental plants. You will also learn how to maintain plants on a seasonal basis, including the skills required for effective weed control, pruning, watering and feeding, and the identification and control of common plant pests and diseases.

This unit will allow you to acquire skills to an industry standard, enabling you to work as a gardener in domestic gardens or as an operative for larger landscape companies or parks departments.

Learning aims

In this unit you will:

A Prepare sites for planting ornamental plants

B Plant and establish ornamental plants

C Understand the methods used for the seasonal maintenance of ornamental plants, beds and borders.

Unit summary

Learning aim	Key teaching areas	Summary of suggested assessment evidence
A Prepare sites for planting ornamental plants	**A1** Site clearance **A2** Soil cultivation	Photographic or video evidence of learners carrying out practical activities. This will be supported by observation records/witness statements and work diaries. Knowledge and understanding of elements of plant and border maintenance may be evidenced by the production of an annual maintenance schedule for a specified planted area.
B Plant and establish ornamental plants	**B1** Laying out and planting to a given plan	
C Understand the methods used for the seasonal maintenance of ornamental plants, beds and borders	**C1** Understand the maintenance and management of plant growth and development **C2** Understand the management of threats to plant health	

Key teaching areas in this unit include:

Sector skills	Knowledge	Transferable skills/behaviours
• Safe use of tools and equipment • Site clearance and ground preparation • Planting and aftercare • Seasonal maintenance • Working to professional standards	• Selection of tools, equipment and materials • Appropriate methods of soil cultivation • Reasons for post-planting and seasonal maintenance operations • Seasonality of planting and maintenance operations • Identification of weeds, pests and diseases • Health and safety, and environmental protection	• Working with others • Developing practical and technical skills • Problem solving • Managing information • Self-management and development

Unit content

Knowledge and sector skills

Learning aim A: Prepare sites for planting ornamental plants

Learners will develop the practical skills needed to prepare and establish ornamental plants in response to a given plan.

A1 Site clearance

- Tools and equipment to prepare the site, such as:
  - digging spades and forks
  - pickaxes and mattocks
  - landscape rakes
  - wheelbarrows.
- Maintenance of tools and equipment before, during and after work.
- Safe and secure storage of tools and equipment following use.
- Clearance of weeds and debris.
- Minimise damage, unnecessary waste and unwanted impacts on the site, such as:
  - damage of plants to be retained
  - damage to underground services
  - damage to soil structure
  - loss of topsoil.
- Correct disposal of debris.

A2 Soil cultivation

- Cultivate ground using hand tools and mechanical cultivators.
- Prepare the ground in a way that is appropriate to the plants being established, the soil type and ground conditions, such as:
  - heavy, light and stony soils
  - wet soils, compacted soils and very dry soils.
- Identify and manage possible harmful impacts of cultivation activities, such as:
  - damage of plants to be retained
  - damage to underground services
  - inversion of soil profile.
- Apply and incorporate fertilisers and organic matter as appropriate.

Learning aim B: Plant and establish ornamental plants

Learners will develop the knowledge and skills needed to plant and establish ornamental plants using appropriate tools and equipment.

B1 Laying out and planting to a given plan

- Receive incoming plants:
  - handle and prepare plants in a way that maintains their health and condition
  - store plants in a way that maintains their health and condition.
- Plant material, to include:
  - trees
  - shrubs
  - herbaceous perennials or seasonal bedding plants.

- Position and plant material with reference to:
  - spacing
  - planting depth
  - firming in
  - planting instructions/plans.

Learning aim C: Understand the methods used for the seasonal maintenance of ornamental plants, beds and borders

C1 Understand the maintenance and management of plant growth and development

Learners will understand the range of activities required to maintain an established planting.

- Irrigation, such as:
  - timing of applications
  - amounts required at each application
  - types of irrigation equipment.
- The application of fertilisers, such as:
  - timing of applications
  - amounts required at each application.
- The use of organic mulches:
  - to suppress annual weeds
  - to retain soil moisture
  - to protect soil structure
  - for aesthetic effect.
- Regulatory and regenerative pruning:
  - appropriate to the species
  - appropriate to the plant's stage of development.
- Deadheading, such as:
  - herbaceous perennials
  - shrubs/roses
  - bedding plants.
- Training and support.
- Cutting down or removal of:
  - herbaceous perennials
  - bedding plants.

C2 Understand the management of threats to plant health

Learners will identify the common threats to plant health and understand how these may be managed or controlled.

- Annual and perennial weeds.
- Pests and diseases, such as:
  - aphids
  - caterpillars
  - capsid bug
  - slugs
  - snails
  - powdery mildew
  - rose black spot.

- Intentional and accidental physical damage, such as:
  - excavations for the installation of cables and services
  - trampling/damage from vehicles
  - vandalism
  - theft.
- Environmental threat:
  - drought
  - waterlogging
  - storm damage.

Transferable skills

Working with others

- Listening to other team members and respecting their contribution. Discussing with others how to overcome problems. Taking on additional work and responsibilities.

Developing practical and technical skills

- Demonstrating practical skills. Using tools, equipment and materials appropriately and safely.

Problem solving

- Identifying potential problems. Adapting to constraints imposed by soil and weather conditions.

Managing information

- Interpreting plans and verbal instructions. Complying with health and safety and environmental protection regulations.

Self-management and development

- Working in a professional manner. Reviewing own progress. Working to deadlines.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Prepare sites for planting ornamental plants		
A.P1 Carry out site clearance and disposal of waste.	**A.M1** Carry out appropriate site clearance and preparation, identifying potential unwanted impacts of clearance and cultivation activities.	**A.D1** Confidently carry out effective site clearance, preparation and cultivation, identifying opportunities for improvements to practices.
A.P2 Carry out basic soil cultivation.		
Learning aim B: Plant and establish ornamental plants		
B.P3 Carry out positioning and planting with reference to a specified plan.	**B.M2** Carry out positioning and planting with reference to a specified plan, using appropriate processes and aftercare techniques relevant to planting specifications.	**B.D2** Confidently carry out positioning and planting with reference to a specified plan, justifying the process and aftercare techniques used.
B.P4 Provide basic aftercare actions to meet the planting specification.		
Learning aim C: Understand the methods used for the seasonal maintenance of ornamental plants, beds and borders		
C.P5 Identify the methods used to maintain plant growth and development.	**C.M3** Describe the methods used to maintain plant growth and development.	**C.D3** Describe the methods used to effectively maintain ornamental plantings, and the importance of seasonality on maintenance operations.

Essential information for assessment decisions

In this unit, learners will fulfil clients' requirements for the clearance and cultivation of sites for the establishment of ornamental plants, including trees, shrubs, herbaceous perennials and seasonal bedding plants. They will also carry out seasonal maintenance tasks to maintain plant vigour and manage plant growth and development. Requirements and plans will be specified and not produced by learners.

In providing evidence for this unit, learners will frequently be required to work as part of a team. It is essential that all learners carry out all tasks and rotate roles where necessary. Evidence should be sufficiently detailed to enable tutors to make a judgement about the quality and sufficiency of the performance of individual learners.

The practical activities required by this unit may be evidenced using observation records or witness statements. These should be supported by clear photographic or video evidence of individual learners carrying out the activities and by learners' work diaries in which they record the tasks they have carried out.

For learning aim C, learners will need to be able to identify and describe the range of seasonal maintenance tasks required to maintain a specified area of mixed planting, which will include both woody and herbaceous plants.

Learning aim A

For distinction standard, learners will:

- carry out tasks in a confident and professional manner
- evaluate the working practices that they have used, and report on modifications made to tasks carried out to ensure that working practices are suitable for the plants, soil type, ground conditions, type of site, and weather conditions.

For merit standard, learners will:

- carry out tasks to meet specifications effectively and efficiently. They will describe the unwanted impacts that may occur to a site when preparing ground and how these may be avoided or minimised.

For pass standard, learners will:

- use tools and equipment in a safe and efficient manner. They will ensure that tools and equipment are properly maintained before, during and after work
- clear sites of weeds and debris, disposing of these in the correct manner
- cultivate the ground using hand tools and powered equipment in a way that is appropriate to the plants being established, the soil type and the ground conditions, incorporating bulky organic matter and pre-planting fertiliser as appropriate.

Learning aim B

For distinction standard, learners will:

- confidently carry out positioning and planting with reference to a specified plan, justifying the process and aftercare techniques used
- carry out tasks in a confident and professional manner. They will explain and justify the techniques they have employed to establish the plants, with reference to the types of plants used, soil type, the type of site and the prevailing ground and weather conditions.

For merit standard, learners will:

- carry out planting and aftercare tasks to meet specifications effectively and efficiently, and in a professional manner. Learners will complete tasks competently and at a rate that is professionally acceptable given the prevailing ground and weather conditions.

For pass standard, learners will:

- select plant material as required and transport, handle and prepare the plants in a way that maintains their health and condition according to the prevailing conditions
- set the plants in the correct positions with appropriate spacing. They will plant at the proper depth, backfill and firm-in as appropriate to the soil type and condition
- provide appropriate aftercare, including watering in and support, protection from vermin or physical damage, and mulching as required.

Learning aim C

For distinction standard, learners will:

- describe the methods used to maintain ornamental plants, beds and borders effectively and efficiently to maintain and enhance their decorative display
- describe the importance of timing on maintenance operations, showing an understanding of the seasonality of maintenance tasks and, for a specified site, identifying other tasks appropriate to other times of the year.

For merit standard, learners will:

- describe the methods used to maintain plant growth and development for a specified planted area
- describe ways in which to manage the threats to plant health they would expect to encounter.

For pass standard, learners will:

- state the methods used to maintain plant growth and development for a specified planted area
- identify the threats to plant health they would expect to encounter.

Assessment activity

The summative assessment activity takes place after learners have completed their formative development. The activity should be practical, be set in a realistic scenario and draw on learning from the unit, including the transferable skills. You will need to give learners a set period of time and number of hours in which to complete the activity. *Section 6* gives information on setting assignments and there is further information on our website.

A suggested structure for summative assessment is shown in the *Unit summary* section, along with suitable forms of evidence. This is for illustrative purposes only and can therefore be adapted to meet local needs or to assess across units where suitable opportunities exist. The information in the *Links to other units* section will be helpful in identifying opportunities for assessment across units.

The following scenario could be used to produce the required evidence for this unit. Centres are free to use comparable scenarios or other forms of evidence provided that they meet the assessment requirements of the unit.

Suggested scenario

You have been asked to establish a new mixed border in the grounds of a local primary school. The border is to contain shrubs, herbaceous perennials and an ornamental tree. You will need to prepare the site for planting, plant up the border and carry out all the necessary aftercare tasks to help the plants become established. In addition, the school has asked you to give advice on how the border is to be maintained in the years following establishment.

You will work as an effective member of the team, working in a professional manner to accurately fulfil the specifications while also complying with health and safety and environmental protection regulations.

If a retake is necessary, an alternative example must be used. The following is an example of a retake assessment activity.

A local community centre has asked you to plant up a display of seasonal bedding to commemorate the anniversary of its founder. The display will comprise decorative shrubs and seasonal bedding plants, including tall standards that will require supporting. The bed is required to last from late spring until the following late autumn. You will need to prepare the site for planting, plant up the display and carry out all the necessary aftercare tasks to help the plants become established. The centre has also asked you to provide them with a maintenance schedule, which will enable them to maintain a decorative display until the plants are removed.

You will work as an effective member of the team, working in a professional manner to accurately fulfil the specifications while also complying with health and safety and environmental protection regulations.

Further information for tutors and assessors

Delivery guidance

The following are examples of practical activities and workshops that tutors could use when developing sector and transferable skills in the delivery of this unit. Wherever possible, practical activities should be used to help learners develop both personal and sector skills in preparation for the final assessment. These suggestions are not intended as a definitive guide to cover the full GLH of the unit.

Introduction to unit Theory session: introduction to health and safety on site, including the possible hazards and risks involved in practical activities. Correct disposal of organic and inorganic waste. **Suggested time:** about 2 hours.
Activity: Site preparation Practical demonstrations, and learners will practise on-site preparation and soil cultivation, including the use of hand tools and a pedestrian-operated cultivator. **Suggested time:** about 6 hours.
Activity: Planting and aftercare Theory session: care of plants before planting, planting theory, aftercare. Practical demonstrations, and learners will practise planting a range of plants and carrying out aftercare. **Suggested time:** about 6 hours.
Activity: Threats to plant health Theory session: identifying risks to plant health, promoting healthy growth in plants, recognising and managing problems. Classroom activity: identification of pests, diseases and weeds. **Suggested time:** about 3 hours.
Activity: Seasonal maintenance tasks Theory session: maintaining and controlling plant growth and development. Site visits to a range of established ornamental planted areas to assess seasonal maintenance requirements and threats to plant health. **Suggested time:** about 6 hours.

Essential resources

For this unit, learners will need access to a sufficiently large, clear, secure and reasonably level area to practise soil preparation and planting. There should be piped water available on site for watering the plants. Learners will need sufficient hand tools for site preparation and planting (for example digging spades and forks, landscape rakes and wheelbarrows), as well as access to a powered cultivator. All learners will need appropriate personal protective equipment (PPE) (steel toe-cap work boots, overalls and gloves). There will need to be sufficient consumable and reusable materials in order to practise all practical tasks (for example plants, tree stakes and ties, tree guards and organic matter for soil improvement and mulching).

Links to other units

This unit has strong links to:

- Unit 1: Introduction to Working in Land-based Industries
- Unit 2: Introduction to Plant and Soil Science
- Unit 3: Horticulture Work Placement
- Unit 4: Land-based Machinery Operations
- Unit 7: Nursery Stock Production.

Employer involvement

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

Unit 10: Construction and Maintenance of Hard Landscapes

Level: **2**

Unit type: **Optional**

Assessment type: **Internal**

Guided learning hours: **30**

Unit in brief

Learners will develop the skills needed to set out and construct landscape foundations, surfaces and structures in a safe and efficient manner.

Unit introduction

Hard landscaping is a vital part of the domestic and commercial horticulture industry. Features such as patios, paths, fences and pergolas form important components of many parks, gardens and landscapes. Landscape companies and their clients would expect the landscaper to be multi-skilled, and to carry out any task required on a garden build in a skilled and professional manner.

In this unit, you will learn the practical skills needed to set out and prepare a site for a range of hard surfaces and structures. You will also develop the skills and understanding necessary for the installation and maintenance of hard surfaces and vertical features.

This unit will enable you to develop and practise the skills and knowledge required to meet industry standards in a variety of sectors. These include design and construction, specialist hard landscaping and general garden and landscape maintenance companies.

Learning aims

In this unit you will:

A Set out and prepare sites for hard landscaping

B Install horizontal and vertical hard landscape features

C Maintain horizontal and vertical hard landscape features.

Unit summary

Learning aim	Key teaching areas	Summary of suggested assessment evidence
A Set out and prepare sites for hard landscaping	**A1** Setting out the site for the installation of horizontal and vertical hard landscapes **A2** Clearance and preparation **A3** Hazards and limitations imposed by surface and underground obstructions	Photographic or video evidence of learners carrying out practical activities. This will be supported by observation records/witness statements and work diaries. Cognitive and reflective elements may be evidenced by learners' answers to relevant verbal and short written questions or by short written and verbal reports.
B Install horizontal and vertical hard landscape features	**B1** Excavation and installation of foundations and sub-bases for subsequent works **B2** Installation of surfaces **B3** Locating and fixing of posts for fences and vertical structures **B4** Placing and fixing components of fences and vertical structures	
C Maintain horizontal and vertical hard landscape features	**C1** Maintenance of hard landscape surfaces **C2** Maintenance and repair of fences and vertical structures	

Key teaching areas in this unit include:

Sector skills	Knowledge	Transferable skills/behaviours
• Measuring and setting out • Use of tools and equipment • Preparation and handling of materials • Construction operations	• Properties of materials • Selection of tools and equipment • Managing obstacles and hazards • Maintenance requirements of structures and surfaces • Health and safety	• Working with others • Managing information • Self-management and development

Unit content

Knowledge and sector skills

Learning aim A: Set out and prepare sites for hard landscaping

Learners will develop the skills required to set out and prepare a site for the installation of horizontal and vertical hard landscape features.

A1 Setting out the site for the installation of horizontal and vertical hard landscapes

- Straight lines.
- Right angles.
- Curves and irregular shapes.

A2 Clearance and preparation

- Removal of:
  - weeds
  - surface debris
  - buried debris.
- Disposal of:
  - organic waste
  - inorganic waste.

A3 Hazards and limitations imposed by surface and underground obstructions

- Location of underground services.
- Management of above-ground and underground obstructions.
- Minimising damage to plants and features to be retained.

Learning aim B: Install horizontal and vertical hard landscape features

Learners will develop the skills for the installation of horizontal and vertical landscape features with reference to a provided plan.

B1 Excavation and installation of foundations and sub-bases for subsequent works

- Excavate to specified levels and falls in a single direction.
- Mix concrete for foundations by hand and by using a concrete mixer.
- Install granular and concrete foundations and sub-bases appropriate to final use.

B2 Installation of surfaces

- Kerbs, edge restraints and surface drainage channels for hard landscape surfaces, such as:
  - precast concrete kerbs
  - small unit edgings
  - surface drainage channels.
- Rigid and flexible surfaces, such as:
  - natural and precast concrete paving
  - brick or concrete paviours
  - small units, such as setts and cobbles
  - pointing of completed surfaces.

B3 Locating and fixing of posts for fences and vertical structures

- Wooden or concrete posts.
- Concrete dollies.
- Metal post supports.

B4 Placing and fixing components of fences and vertical structures

- Wooden gravel boards.
- Fence panels.
- Close board fencing.

Learning aim C: Maintain horizontal and vertical hard landscape features

C1 Maintenance of hard landscape surfaces

- Cleaning options, including using cleaning agents and pressure washing.
- Re-pointing.
- Replacement of damaged paving units and other surface components.

C2 Maintenance and repair of fences and vertical structures

- Selection and application of timber preservative.
- Repair of fence posts and other components of vertical structures.

Transferable skills

Working with others

- Listening to other team members and respecting their contribution. Discussing with others how to overcome problems. Taking on additional work and responsibilities.

Managing information

- Interpreting plans and verbal instructions. Complying with health and safety and environmental protection regulations.

Self-management and development

- Working in a professional manner.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Set out and prepare sites for hard landscaping		
A.P1 Undertake the setting out of horizontal and vertical landscape features.	**A.M1** Carry out appropriate setting out and site preparation for horizontal and vertical landscape features, identifying hazards, limitations and their impact on working practices.	**A.D1** Carry out confident and effective setting out and site preparation, adapting to obstructions and other constraints imposed by site conditions.
A.P2 Carry out site clearance and basic preparation.		
Learning aim B: Install horizontal and vertical hard landscape features		
B.P3 Carry out basic installation of horizontal surfaces.	**B.M2** Carry out installation of horizontal and vertical landscape features with reference to a hard landscape detail plan, using appropriate materials and techniques.	**B.D2** Confidently carry out installation of horizontal and vertical landscape features, justifying the selection and use of materials and techniques when responding to the plan.
B.P4 Carry out basic installation of posts and vertical features.		
Learning aim C: Maintain horizontal and vertical hard landscape features		
C.P5 Identify the operations required to maintain horizontal and vertical hard landscape features.	**C.M3** Describe the available options for maintaining horizontal and vertical landscape features effectively.	**C.D3** Assess different options for cleaning and maintaining horizontal and vertical landscape features.

Essential information for assessment decisions

In this unit, learners will carry out the installation of hard landscape surfaces and structures and show an understanding of how these are to be maintained to preserve their function and appearance. Requirements and plans will be specified and not produced by learners.

In providing evidence for this unit, learners will frequently be required to work as part of a team. It is essential that all learners carry out all tasks and rotate roles where necessary. Evidence should be sufficiently detailed to enable tutors to make a judgement about the quality and sufficiency of the performance of individual learners.

The practical activities required by this unit may be evidenced using observation records and/or witness statements. These should be supported by clear photographic or video evidence of individual learners carrying out the activities, and by learners' work diaries in which they record the tasks they have carried out.

The assessment of the knowledge elements in this unit may be evidenced by learners' responses to short verbal or written questions or by short written and verbal reports.

Learning aim A

For distinction standard, learners will:

- set out landscape features accurately from a pre-existing plan, including straight lines and rectilinear features
- work confidently, reliably and responsibly to clear and prepare a site with due regard to health and safety, taking necessary measures to protect plants and features to be retained
- show flexibility in adapting working practices to accommodate, and avoid damage to, above-ground and underground obstacles such as underground services and inspection covers.

For merit standard, learners will:

- read a pre-existing plan to set out vertical and horizontal landscape features accurately, including simple rectilinear features
- clear sites effectively and efficiently, disposing of waste in the correct and environmentally responsible manner
- identify options for locating and managing above-ground and underground obstacles such as underground services and inspection covers.

For pass standard, learners will:

- follow verbal instructions to accurately locate and set out hard landscape features. These must include straight lines and rectilinear features
- use the correct tools and equipment to clear the site of weeds and debris in a safe and efficient manner, disposing of waste as directed to do so.

Learning aim B

For distinction standard, learners will:

- confidently and competently carry out the installation of horizontal and vertical landscape features, working from plans to establish correct levels and falls
- explain how the choice of materials, techniques and depth of foundations support the requirement set out in the plan.

For merit standard, learners will:

- carry out the installation of horizontal and vertical hard landscape features according to specifications of a hard landscape detail plan, working to established levels and falls

- select the correct components and materials, and place and fix the components according to specifications. They will identify ways to overcome constraints such as changes in ground level, plants and features that are to be retained, and runs that do not conform to the standard dimensions of components.

For pass standard, learners will:

- excavate sites to install foundations and sub-bases to pre-established levels using the appropriate tools
- mix the concrete for the foundations by hand and by using a concrete mixer to a specified mix
- install edge restraints, paved surfaces and surface drainage as specified
- locate and fix posts according to specifications. They will install components for vertical structures as specified in the unit content
- work safely at all times.

Learning aim C

For distinction standard, learners will:

- compare and contrast the available options available for cleaning and maintaining specified horizontal and vertical features in an effective and efficient manner
- justify the options they have chosen for the specified features.

For merit standard, learners will:

- describe the range of available options for cleaning and maintaining hard surfaces, such as the use of cleaning agents and pressure washers, methods for replacing damaged surface units and repairing or replacing pointing
- describe the available options for the maintenance and repair of vertical structures.

For pass standard, learners will:

- identify the range of tasks required to clean, maintain and repair horizontal and vertical features in a safe and effective manner.

Assessment activity

The summative assessment activity takes place after learners have completed their formative development. The activity should be practical, be set in a realistic scenario and draw on learning from the unit, including the transferable skills. You will need to give learners a set period of time and number of hours in which to complete the activity. *Section 6* gives information on setting assignments and there is further information on our website.

A suggested structure for summative assessment is shown in the *Unit summary* section, along with suitable forms of evidence. This is for illustrative purposes only and can therefore be adapted to meet local needs or to assess across units where suitable opportunities exist. The information in the *Links to other units* section will be helpful in identifying opportunities for assessment across units.

The following scenario could be used to produce the required evidence for this unit. Centres are free to use comparable scenarios or other forms of evidence provided that they meet the assessment requirements of the unit.

Suggested scenario

You are part of a small team installing a paved area edged with a kerb made up from small units. The paved area is bounded on one side by a panelled fence.

In order to shed surface water, the paved area requires a fall of 1 in 100 away from the fence line with an interception drain to take away the water.

You will set out and install the specified features according to a given plan. You will be observed demonstrating your skills, including your selection of the correct tools, equipment, materials and working practices to fulfil the specifications, and you will demonstrate your understanding of how to overcome any constraints imposed by the site on your activities. After the work has been completed, you will comment on the future maintenance requirements of the surface and fence.

You will work as an effective member of the team, working in a professional manner to accurately fulfil the specifications while also complying with health and safety and environmental protection regulations.

If a retake is necessary, an alternative example must be used. The following is an example of a retake assessment activity.

You are working in a domestic garden installing a flagstone path with precast concrete edging strips, terminating in a small paved area to hold the households recycling bins. This paved area is backed with a run of close board fencing.

In order to shed surface water, the paved area requires a fall of 1 in 100 parallel to the fence line with an interception drain to take away the water.

You will set out and install the specified features according to a given plan. You will be observed demonstrating your skills, including your selection of the correct tools, equipment, materials and working practices to fulfil the specifications, and you will demonstrate your understanding of how to overcome any constraints imposed by the site on your activities. After the work has been completed, you will comment on the future maintenance requirements of the surface and fence.

You will work as an effective member of the team, working in a professional manner to accurately fulfil the specifications while also complying with health and safety and environmental protection regulations.

Further information for tutors and assessors

Delivery guidance

The following are examples of practical activities and workshops that tutors could use when developing sector and transferable skills in the delivery of this unit. Wherever possible, practical activities should be used to help learners develop both personal and sector skills in preparation for the final assessment. These suggestions are not intended as a definitive guide to cover the full GLH of the unit.

Introduction to unit Theory session: introduction to health and safety on site, including the possible hazards and risks involved in practical activities. Correct disposal of organic and inorganic waste. **Suggested time:** about 2 hours.
Activity: Setting out from a plan Demonstration, and learners will practise setting out straight lines and right angles. Setting levels and falls. **Suggested time:** about 3 hours.
Activity: Installing foundations and sub-bases Demonstration and supervised practice. Excavating and preparing the site for foundations and sub-bases. Mixing concrete by hand and mechanical mixer. Laying foundations and sub-bases for hard surfaces. **Suggested time:** about 5 hours.
Activity: Installing kerbs and drainage channels Demonstration, and learners will be supervised as they practise installing Portland Pozzolana Cement (PPC) and small unit kerbs and surface drainage channels. **Suggested time:** about 5 hours.
Activity: Laying paving for paths or patios Demonstration, and learners will be supervised as they practise laying paving on a sand bed. **Suggested time:** about 5 hours.
Activity: Installing a fence Demonstration, and learners will be supervised as they practise erecting fence posts and installing panels and close board fencing. **Suggested time:** about 5 hours.
Activity: How to maintain hard landscape features Lecture and learner discussion. **Suggested time:** about 3 hours.

Essential resources

For this unit, learners will need access to a sufficiently large, clear, secure and reasonably level area for marking out and to carry out excavations and installation. Covered areas would be particularly useful to allow work to carry on in bad weather, but uncovered areas are essential if work is carried out in hot or sunny conditions. There should be piped water available on site for mixing concrete. Learners will need access to the appropriate equipment such as measuring and setting-out equipment (for example tapes, pins, lines, builders' set squares); levelling equipment (for example pegs, spirit levels, levelling beams); hand tools for site preparation, mixing and laying concrete and paving, erecting fences; powered tools for mixing and laying concrete and paving (for example mixers, vibrating plates); and appropriate personal protective equipment (PPE) (steel toe-cap work boots, overalls, gloves and eye protection). There will need to be sufficient consumable and reusable materials in order to practise all practical tasks.

Links to other units

This unit has strong links to:

- Unit 1: Introduction to Working in Land-based Industries
- Unit 3: Horticulture Work Placement
- Unit 4: Land-based Machinery Operations.

Employer involvement

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

Unit 11: Estate Maintenance in Horticulture

Level: **2**

Unit type: **Mandatory**

Assessment type: **Internal Synoptic**

Guided learning hours: **60**

Unit in brief

Learners will study how to carry out the repair, maintenance and installation of boundaries, surfaces, structures and services found in the horticulture sector.

Unit introduction

Working in horticulture often involves basic tasks, including repairing fences, installing gates and providing water for plants. These are tasks requiring estate skills, and they are common to many land-based industries.

In this unit, you will learn how to carry out inspections, and to select, use and maintain tools, equipment and materials to carry out estate tasks safely and efficiently. You will learn how to work to a standard expected in industry and you will be able to review your work, identifying improvements. This unit is synoptic, which means you will use the skills and knowledge developed in other units. The tasks that you carry out will link to the work you have completed elsewhere in this qualification.

This unit is essential for those wanting to work in horticulture. The skills and knowledge are equally important if you want to work in forestry, agriculture or countryside management. This unit also offers a valuable insight into the skills necessary to keep the countryside working and in good order.

Learning aims

In this unit you will:

A Carry out inspections to plan maintenance, repair and installation tasks

B Select and prepare materials, tools and equipment for maintenance, repair and installation tasks

C Undertake maintenance, repair and installation tasks.

Unit summary

<table>
<tr><th>Learning aim</th><th>Key teaching areas</th><th>Summary of suggested assessment evidence</th></tr>
<tr><td>A Carry out inspections to plan maintenance, repair and installation tasks</td><td>A1 Inspecting for repair, maintenance and installation needs
A2 Plan for repair, maintenance and installation needs</td><td rowspan="3">Evidence could include:
• logbooks/blogs
• witness/observation records
• specifications
• reports
• maps/plans/sketches/ diagrams.</td></tr>
<tr><td>B Select and prepare materials, tools and equipment for maintenance, repair and installation tasks</td><td>B1 Selecting and preparing tools, equipment and materials
B2 Health and safety</td></tr>
<tr><td>C Undertake maintenance, repair and installation tasks</td><td>C1 Carry out maintenance, repair and installation tasks
C2 Review maintenance, repair and installation tasks</td></tr>
<tr><td colspan="3">Key teaching areas in this unit include:</td></tr>
<tr><th>Sector skills</th><th>Knowledge</th><th>Transferable skills/behaviours</th></tr>
<tr><td>• Estate inspection to identify tasks
• Tools, materials and equipment selection and use for estate tasks
• Drawing up and/or working to habitat maintenance specifications</td><td>• Boundaries, surfaces, structures and services
• Tools, equipment and materials used for estate tasks
• Safe working practice</td><td>• Communication
• Working with others
• Thinking skills/adaptability
• Problem solving</td></tr>
</table>

Unit content

Knowledge and sector skills

Learning aim A: Carry out inspections to plan maintenance, repair and installation tasks

Learners will apply the knowledge and skills that they have developed in the qualification to assess and record the repair and maintenance needs of a selected area.

A1 Inspecting for repair, maintenance and installation needs

- Conducting surveys/inspections of:
  - horticulture boundaries, e.g. post and rail, electric, stock fencing, rabbit fencing, hedgerows, sports turf
  - surfaces, e.g. woodchip, concrete, paving stones, block weave, grass, aggregate (type 1)
  - structures, e.g. gazebos, pergolas, gates, signs, greenhouses, polytunnels, raised beds
  - services, e.g. mains or temporary gas, water and electric.
- Identifying the causes of damage, wear or poor condition.
- Identifying maintenance, repair and installation needs.
- Identifying the consequences if maintenance, repair or installation tasks are not carried out.
- Recording findings using the appropriate method and format, e.g. field notes/maps/sketches/photos.

A2 Plan for repair, maintenance and installation needs

- Identifying tasks, including:
  - complex tasks needing multiple operations and a variety of tools, equipment and materials, e.g. making a potting bench, maintaining boundaries
  - simple tasks needing few operations and a limited range of tools, equipment and materials, e.g. checking fuel oil levels, connecting a hose to a tap, replacing rails on a post and rail fence.
- Drawing up specifications, to include:
  - location, e.g. on maps, plans, use of GPS
  - timescale, e.g. duration, appropriateness of season
  - description of task, including standard required and working tolerances, if appropriate
  - tools, materials, equipment needed
  - identified risks
  - identification of skill set (e.g. particular skills needed for the tasks identified)
  - oversight, e.g. person in charge of task/supervision.

Learning aim B: Select and prepare materials, tools and equipment for maintenance, repair and installation tasks

Learners will apply the knowledge and skills that they have developed in the qualification to select and prepare appropriate materials, tools and equipment for specific tasks identified in the inspection report.

B1 Selecting and preparing tools, equipment and materials

- Factors influencing selection, e.g. cost, availability.
- Consequences of correct/incorrect selection, e.g. poor-quality work, unsafe practice through use of inappropriate tools.
- Factors influencing the preparation of tools, equipment and materials, e.g. condition, availability.
- Tools, e.g. saws, hammers, billhooks, rakes, spades/shovels, drills.
- Equipment, e.g. non-contact electrical test equipment, strimmers/brush cutters, wheelbarrows.
- Materials, e.g. nails, cement/concrete, woodchip, aggregates.
- Identifying the skill set for tool, equipment and materials' use.

B2 Health and safety

- Learners will need to prepare a risk assessment for each listed maintenance task. They will apply their knowledge and understanding of correct health and safety practices, which they have developed throughout this qualification.
- Use and preparation of risk assessments, to include the identification and assessment of hazards and risks, and mitigating action in the following areas:
  - health and safety, e.g. safe use of tools, equipment and materials
  - animal welfare, e.g. reducing animal stress/disturbance
  - environmental protection, e.g. protection of habitats
  - waste disposal, e.g. plastics, discarded materials
  - safe manual handing, e.g. when lifting or using tools, equipment or materials
  - selection of personal protective equipment (PPE), both prior to and during work.
- Use of standard or generic risk assessments, e.g. when using chainsaws, wood preserver.
- In-work risk assessing, e.g. monitoring safe working practices, dealing with unexpected hazards.

Learning aim C: Undertake maintenance, repair and installation tasks

Carrying out estate maintenance, repair and installation; reviewing the process of task completion and task outcomes.

C1 Carry out maintenance, repair and installation tasks

- Transporting tools, equipment and materials:
  - use of carry bags, toolboxes
  - transporting in vehicles, carrying tools and equipment safely
  - consequences of correct/incorrect transport.
- Establishing a safe working area, e.g. clearing scrub, isolating water, removing obstructions.

- Maintenance, repair or installation, such as:
  - boundaries, including:
    - boundary fencing, e.g. straining, replacing posts or mesh
    - pest-prevention fencing, e.g. rabbit/deer fencing, electric fencing
    - post and rail fencing, e.g. use of wood preservers, replacement of worn or damaged parts
    - hedgerows, e.g. pruning, pollarding, hedge laying
  - surfaces, e.g. paths, tracks, hard standings, polytunnel/greenhouse standings/floorings, grass, decorative stone
  - structures, including:
    - polytunnels, e.g. erection, coverings, ventilation, fixtures and fittings
    - greenhouses, e.g. erection, glazing, ventilation, fixtures and fittings
    - storage buildings, signage, gates, stiles, decorative structures, gazebos and pergolas
  - mains or temporary services (gas/oil, electric, water/sewerage), including:
    - identification of services
    - electrical, e.g. basic circuit testing; provision of outdoor mains or temporary power using generators, extensions, waterproof/resistant fittings, isolation of electrical supply
    - water, e.g. mains, bowser or hose supply to beds; hydroponic systems; field sprinklers; waste water removal/drainage; isolation of water supply
    - gas/oil, e.g. use of mains, butane or propane, and fuel oil for permanent or temporary heating, isolation of gas/oil supply.
- Working to a standard, including:
  - working to time
  - achieving quality standards
  - working to a specification.
- Monitoring progress, risk assessing, problem solving.
- Minimising environmental impacts and maintaining animal welfare.
- Correct waste disposal.
- Maintaining tools, equipment and materials:
  - assessing needs and carrying out the maintenance of tools, equipment and materials
  - use of aids for maintenance, e.g. sharpening files/stones/guides, oils, tools required for disassembly/assembly
  - replacing parts, e.g. air filters, drill bits, bow saw blades
  - consequences of correct/incorrect maintenance.
- Storage of tools, equipment and materials:
  - storage for safety and security
  - storing to maintain condition
  - regulations governing storage, e.g. flammable liquids
  - consequences of correct/incorrect storage.

C2 Review maintenance, repair and installation tasks

- Assessing a product against the specification, e.g. with reference to the time taken and the quality of the product.
- Reviewing process, e.g. how confidently and efficiently was the task completed?
- Identifying improvements to both product and process, e.g. the use of different tools, improving skills, different sequence of operations.

Transferable skills

Communication

- Writing up risk assessments and specifications.

Working with others

- Completing tasks requiring more than one person.

Thinking skills/adaptability

- Carrying out inspections to determine needs.
- Formulating tasks based on maintenance, repair and installation needs.

Problem solving

- Overcoming obstacles when carrying out tasks.
- In-work risk assessing.

Assessment criteria

Pass	Merit	Distinction
Learning aim A: Carry out inspections to plan maintenance, repair and installation tasks		
A.P1 Carry out site inspections, recording appropriate maintenance, repair and installation needs.	**A.M1** Carry out accurate site inspections and findings to plan complex maintenance, repair and installation tasks, producing specifications to an agreed standard.	**A.D1** Carry out effective site inspections, recording detailed needs and producing fully justified specifications for complex maintenance, repair and installation tasks.
A.P2 Plan appropriate maintenance, repair and installation tasks.		
Learning aim B: Select and prepare materials, tools and equipment for maintenance, repair and installation tasks		
B.P3 Select tools, equipment and materials for specific maintenance, repair and installation tasks.	**B.M2** Confidently select the correct tools, equipment and materials, and produce detailed and accurate risk assessments for specified and complex maintenance, repair and installation tasks.	**B.D2** Fully justify the selected tools, equipment, materials, and risk assessments for specific and complex maintenance, repair and installation tasks, identifying improvements and explaining the consequences of choices made.
B.P4 Carry out risk assessments for specific, maintenance, repair and installation tasks.		
Learning aim C: Undertake maintenance, repair and installation tasks		
C.P5 Carry out appropriate maintenance, repair and installation tasks.	**C.M3** Carry out complex maintenance, repair and installation tasks competently to industry standards, reviewing processes and outcomes with reference to the specification.	**C.D3** Confidently and efficiently carry out complex maintenance, repair and installation tasks, reviewing processes and outcomes with reference to the specification, and recommending improvements to inform future practice.
C.P6 Carry out a review of completed maintenance, repair and installation tasks.		

Essential information for assessment decisions

Learning aim A

For distinction standard, learners will:

- confidently carry out effective inspections and detailed recording of complex estate maintenance, repair and installation needs. Effective inspections will include the correct identification of needs and the causes of, for example, poor condition, wear or breakage. Findings will be clear and unambiguous
- use inspection findings and their own observations and research to plan four specified estate maintenance, repair or installation tasks, producing specifications that are fully justified with valid reasons for their decisions.

For merit standard, learners will:

- carry out inspections and recording of complex estate maintenance, repair and installation needs. Learners will confidently assess the needs and produce accurate findings
- use inspection findings, own observations and research to plan four specified estate maintenance, repair or installation tasks that will include a boundary, a surface and a structure. Planning will include the production of specifications or other instruction sets, agreed with the tutor and detailing the tasks and standards to be met
- follow the standards that are defined in the specification, including the expected quality of the finished product and the time taken to produce it. The tasks required will be complex, requiring multiple operations and a variety of tools, equipment or materials.

For pass standard, learners will:

- carry out inspections to identify and record simple maintenance, repair and installation needs
- plan appropriate, maintenance, repair and installation tasks requiring few operations and a limited range of tools, equipment or materials, including a boundary, a surface and a structure.

Learning aim B

For distinction standard, learners will:

- produce detailed risk assessments and confidently select the correct tools, equipment and materials for four specific, complex estate maintenance, repair or installation tasks. Learners will fully justify their selections, giving valid reasons and identifying appropriate improvements. They will be able to explain how correct and incorrect risk assessments and the selection of tools, equipment and materials can affect the progress and outcome of tasks.

For merit standard, learners will:

- produce detailed, accurate risk assessments and confidently select the correct tools, equipment and materials for four specified, complex estate maintenance, repair or installation tasks, including a boundary, a surface and a structure.

For pass standard, learners will:

- select tools, materials and equipment for four simple maintenance, repair and installation tasks, including a boundary, a surface and a structure
- produce risk assessments for four simple maintenance, repair and installation tasks. Learners will identify the critical hazards and correctly risk assess them.

Learning aim C

For distinction standard, learners will:

- carry out four complex estate maintenance, repair or installation tasks to an agreed specification, working confidently and efficiently to industry standards
- review the task progress and outcomes of estate maintenance, repair or installation tasks they have carried out, giving well-reasoned explanations. Learners will identify improvements to both the process of task completion and task outcomes, and explain how the identified improvements could affect future practice.

For merit standard, learners will:

- carry out complex maintenance, repair or installation tasks, including a boundary, a surface and a structure. Learners will demonstrate their ability to work competently to an agreed specification and industry standard
- assess the progress and product of four complex maintenance, repair or installation tasks in relation to the agreed specification.

For pass standard, learners will:

- carry out appropriate maintenance, repair or installation tasks, including a boundary, a surface and a structure. Learners will require little support in the execution of tasks
- review the process and product of maintenance, repair or installation tasks, describing the quality of work produced and the methodology used.

Assessment activity

The summative assessment activity takes place after learners have completed their formative development. The activity should be practical, be set in a realistic scenario and draw on learning from the unit, including the transferable skills. You will need to give learners a set period of time and number of hours in which to complete the activity. *Section 6* gives information on setting assignments and there is further information on our website.

A suggested structure for summative assessment is shown in the *Unit summary* section, along with suitable forms of evidence. This is for illustrative purposes only and can therefore be adapted to meet local needs or to assess across units where suitable opportunities exist. The information in the *Links to other units* section will be helpful in identifying opportunities for assessment across units.

The following scenario could be used to produce the required evidence for this unit. Centres are free to use comparable scenarios or other forms of evidence provided that they meet the assessment requirements of the unit.

Suggested scenario

You are a trainee at a large garden centre that sells plants, shrubs and trees to the public and a range of extensive nurseries. This includes the sale of glasshouses, fields and polytunnels to supply their smaller outlets.

Your task is to carry out inspections and report any maintenance, repair or installation requirements. You will need to plan and carry out tasks to ensure the boundaries, surfaces, structures and basic services function properly.

If a retake is necessary, an alternative example must be used. The following is an example of a retake assessment activity.

Learners will carry out alternative inspections and undertake different tasks.

Further information for tutors and assessors

Delivery guidance

The following are examples of practical activities and workshops that tutors could use when developing sector and transferable skills in the delivery of this unit. Wherever possible, practical activities should be used to help learners develop both personal and sector skills in preparation for the final assessment. These suggestions are not intended as a definitive guide to cover the full GLH of the unit.

Introduction to unit

Learners are introduced to the unit through practical activities that require them to investigate boundaries, surfaces, structures and basic services. This will broaden their experience and, if combined with simple tasks, develop their practical skills.

They should look at a variety of situations where they gain an understanding of the differences between:

- maintain – keep something in good working order, for example lubricate moving parts on a gate, re-strain top wire on a fence
- repair – replace worn or broken parts, for example fill in potholes on a track, replace a gate pintle
- install – move or place something in a new location, for example place a water butt to collect rainwater from a roof.

The introduction is probably best carried out through tutor-led practical demonstrations.

As this is a synoptic unit, the knowledge and skills from other units in the qualification will be essential.

Suggested time: about 6 hours.

Activity: Carrying out inspections, recording findings and task analysis

Learners should understand, through their initial investigations, the difference between 'needs' and 'tasks'. For example:

- A gate drags on the ground when opened – it 'needs' to hang properly.
  Task: adjust the pintles to ensure it clears the ground when opened.
- A member of the public has tripped over a broken, uneven paving stone – the path 'needs' to be safe.
  Task: replace the broken paving stone with a new one, ensuring it is laid flat and level with the surrounding stones.

During these investigations, learners need to develop their analytical and recording skills using a standard format that might include:

- field investigations of boundaries, surfaces, structures and services
- field discussions and recordings of needs, using photographs, sketches, maps and notebooks
- identification of the causes of the needs and the consequences of ignoring them
- a classroom discussion of the resulting tasks, identifying the tools, materials and equipment required
- identifying the processes/steps to task completion, sequencing the task
- individual research/homework on the construction methods, tools, equipment and materials.

Suggested time: about 10 hours.

Activity: Planning, specifications and risk assessments

Learners need to understand the use of specifications and risk assessments as part of planning maintenance, repair and installation tasks.

- A specification should be regarded as an essential working document that would allow someone to carry out a task to a required standard, within a given timescale, and with enough information to ensure smooth and orderly task completion.
- Learners should appreciate the need to anticipate hazards through the use of written risk assessments and in-work risk assessing.

This understanding should take place through a combination of the following.

- Practical investigations:
  - these will help learners understand the need for specifications, identify hazards, discuss risk assessment and mitigation or control measures that could be taken.
- Classroom-based knowledge:
  - this should add breadth and depth to learners' practical investigations. Concepts that are not easily explained in the field should be explored. Learners should practise drawing up specifications for given tasks. They should be encouraged to develop a risk-assessment culture. Learners would benefit from an exploration of generic risk assessments, which are available online
  - classroom sessions should also underpin the practical aspects of risk assessing, taking into consideration the legislation that controls many practical activities. This could be done through scenario-based presentations and case studies.
- Individual research related to specific maintenance, repair and installation tasks:
  - individual research should focus on good-quality sources that relate to risk assessment, and for further practise in developing specifications.

Suggested time: about 8 hours.

Activity: Selection of tools, equipment and materials

The most useful experience learners can gain is through practical maintenance, repair and installation tasks. This should be supported by classroom activities in which they discuss the factors that influence selection of tasks. Care must be taken to ensure learners gain a variety of experiences, that should include:

- hand tools and power tools
- equipment, for example portable generators, concrete mixers
- materials, for example cement, woodchip, polypropylene water pipe (MDPE)
- storage, transport and maintenance of tools, equipment and materials.

Suggested time: about 10 hours.

Activity: Carrying out habitat maintenance

Learners should gain practical experience in carrying out maintenance, repair and installation tasks. This experience should include:

- interpreting specifications and risk assessments in order to plan tasks
- selection and transport of tools, equipment and materials
- preparing the work area
- experience in handling and using a variety of tools, equipment and materials
- safe working practices, including lone working and working near water
- in-work risk assessing and problem solving
- minimising environmental impacts
- clearing the work area and the disposal of waste
- maintenance and storage of tools, equipment and materials.

The practical tasks should include:

- boundaries, surfaces, structures and mains or temporary services
- tasks that are simple – requiring few operations and limited tools, equipment and machinery
- tasks that are complex – requiring multiple operations and a variety of tools, equipment and machinery.

Ideally, the same task should provide both simple and complex experiences. For example, providing water to a glasshouse:

- the simple task might be to divert a downspout into a tank to collect water
- the complex task might be to run an MDPE pipe from an existing water supply and install a tap with hose attachment.

Learners should also experience a range of tasks, including maintenance, repair and installation.

Learners should develop the habit of keeping a logbook, blog or other record of the tasks they carry out, and these can be used for formative assessment.

Learners will need to practise reviewing the progress of the work carried out, relating outcomes to intended aims as expressed through the specification for the task. Important concepts include:

- working to a standard; comparison with industry roles could be made, for example trainee, competent employee, professional in the field
- working to quality; this can be measured against instructions or tolerances in the specification, for example:
  - nails driven through must be bent over/filed flat
  - vertical alignments must be + or - 5 degrees
  - posts must be cut to identical lengths above the rail
  - two coats of preserver with no visible variation in application or brush marks.

In reviewing their tasks, learners also need to examine the methodology, including the use of tools, in-work risk assessing, making good or clearance of the site to find ways of improving the process.

A peer review or the involvement of professionals working in the field would be a good way to evaluate the progress of tasks and outcomes.

Suggested time: about 26 hours (including the time allocated for practical assessments).

Essential resources

For this unit, learners will need access to:

- a variety of practical estate maintenance, repair and installation situations
- suitable tools, equipment and materials.

Links to other units

This unit has strong links to:

- Unit 1: Introduction to Working in Land-based Industries
- Unit 2: Introduction to Plant and Soil Science
- Unit 3: Horticulture Work Placement
- Unit 4: Land-based Machinery Operations
- Unit 5: Propagation Techniques
- Unit 6: Establish and Maintain Plants and Seeds
- Unit 7: Nursery Stock Production
- Unit 8: Maintain Sports and Amenity Turf
- Unit 9: Establish and Maintain Soft Landscapes
- Unit 10: Construction and Maintenance of Hard Landscapes.

Employer involvement

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

- guest speakers and practitioners
- work experience, in particular placements with maintenance teams on large estates/farms/garden centres.

4 Planning your programme

Is there a learner entry requirement?

As a centre, it is your responsibility to ensure that recruited learners 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 1.

Learners are most likely to succeed if they have:

- three or four GCSEs at intermediate grades and/or
- BTEC qualification(s) achieved at least at Level 1
- at least Level 1 equivalent 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 this qualification – so that you are ready to assess learners and so that we can provide the support needed. Further information is given in *Section 7 Administrative arrangements*.

What level of sector knowledge is needed to deliver this qualification?

We do not set any requirements for tutors but expect centres to assess the overall skills and knowledge of the teaching team to ensure that they are relevant and up to date with current industry practice. This will give learners a rich programme to prepare them for progression.

What resources are required to deliver this qualification?

As part of your centre approval, you will need to show that the necessary material resources and workspaces are available to deliver the qualification. For some units, specific resources are required.

What makes good vocational teaching?

The approach to vocational teaching must be led by what is right for the particular sector. Therefore, each unit includes delivery guidance and suggested assessment tasks. Using the delivery guidance and suggested assessment tasks and our additional free delivery guidance and assignment briefs, you can build a course that contextualises learning in real-life and/or employment scenarios. This will naturally draw in the kind of broader attributes valued in the sector, for example correct handling of plants and general maintenance requirements as well as the more general skills needed in work, such as teamwork, and independent learning, that fit well with project-based learning.

What are the requirements for meaningful employer involvement?

This qualification has been designed as a Technical Diploma qualification and as an approved centre you are required to ensure that during their study, every learner has access to meaningful activity involving employers. See *Section 2 Structure* and *Section 8 Quality assurance* for the requirements for employer involvement.

Support for employer involvement

It is important that you give learners opportunities which are of high quality and that are directly relevant to their study. We will support you in this through our guidance materials and by giving you examples of best practice. See *Section 10 Resources and support* for details of the support available, including the Work Experience Toolkit.

What support is available for delivery and assessment?

We provide a wealth of support materials, including schemes of learning, delivery plans, assignment briefs and examples of marked learner work.

To support you with planning your assessments, you will be allocated a Standards Verifier early in the planning stage. There will be extensive training programmes and support from our Subject Advisor team.

For further details see *Section 10 Resources and support*.

How will my learners become more employable through this qualification?

Learners will be acquiring the key technical and sector knowledge, and practical and technical skills that employers need. Employability skills, such as team working and communication, and completing realistic tasks, have been built into the design of the learning aims and content. This gives tutors 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

The Pearson BTEC Level 2 Technical Diploma in Agriculture is assessed using *internal assessments* which are set and marked by tutors.

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

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.

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* available on our website. All members of the assessment team need to refer to this document.

For this qualification, 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. You 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

Our approach to internal assessment for this qualification 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 Units*, and the requirements for delivering assessment given in *Section 7 Administrative arrangements*.

Operating internal assessment

The assessment team

It is important that there is an effective team for internal assessment so that all assessment is planned and verified. For this qualification, it is likely that the team will be small but it is still necessary to ensure that the assessment process is followed. Full information is given in the Pearson *Quality Assurance Handbook*.

The key roles are:

- the Lead Internal Verifier (Lead IV) for the qualification has responsibility for the planning, record keeping and standard setting for the qualification. The Lead IV registers with Pearson annually and organises training using our support materials
- Internal Verifiers (IVs) check that assignments and assessment decisions are valid and that they meet our requirements. In a small team, all people will normally be assessors and IVs. No one can verify their own actions as an assessor
- assessors set or use assignments to assess learners against national standards.

Planning and record keeping

The Lead IV should make sure that there is a plan for assessment of the internally-assessed units and 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*.

Effective organisation

Internal assessment needs to be well organised so that learners' progress 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 Resources and support* 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 qualification. 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 they 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.

You are encouraged to employ a range of formative assessment approaches before putting learners through the assignments to formally assess the units. Formative assessment supports teaching and learning, and should be ongoing throughout the learning process. It enables tutors to enhance learning by giving learners constructive feedback so that they can identify their strengths and weaknesses, and to put measures in place to target areas that need work. Formative assessment approaches that incorporate reflective learning and regular skills assessment are important in encouraging self-development and reflective practice, to ensure that learners progress.

Setting assignments

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. This assignment will be separate from the practice and exploration activities that have been used during the learning period, and learners must understand that the assignment is being used to judge the learning aims. 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.

When setting your assignments, you need to work with the information given in the *Essential information for assessment decisions* and the *Assessment activity* sections of the units. You can choose to use the suggested scenarios or to adapt them to take account of local circumstances, provided that assignments are verified.

In designing your own assignment briefs you should bear in mind the following points.

- A learning aim must always be assessed as a whole and must not be spilt into two or more tasks.
- 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.
- Learners should be given clear tasks, activities and structures for evidence; the criteria should not be given as tasks.
- You must ensure that assignments for synoptic assessment are designed to enable learners to draw on the specific units identified and demonstrate that they can identify and use an appropriate selection of skills, techniques, concepts, theories and knowledge effectively in an integrated way. Assignments for the synoptic unit will be monitored at programme level as part of the standards verification process to ensure that they encourage learners to select and apply their learning from across the qualification in an integrated way.
- Where there is a requirement for assessment to be conducted in the real work environment (mandatory work placement), assignments must be designed to facilitate this. Where there is no mandatory requirement for workplace assessment but learners will be in work placement or work experience settings as a part of the programme, then it would be worthwhile if these assignments were also designed for completion in the real work environment. You must ensure that the work placement or work experience setting gives learners the opportunity to achieve at all grade levels.

As assignments provide a final assessment, they will draw on the specified range of teaching content for the learning objective. The specified teaching 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 a practical performance, they must address all the relevant range of content that applies in that instance.

An assignment brief should have:

- a vocational scenario or context that motivates the learner to apply their learning through the assignment
- an audience or purpose for which the evidence is being provided
- clear instructions to the learner about what they are required to do, normally set out through a series of tasks.

Forms of evidence

The units allow for a variety of forms of evidence to be used, provided that they are suited to the type of learning aim and the learner being assessed. For most units, the practical demonstration of skills is necessary. The units give you information on suitable forms of evidence that would give learners the opportunity to apply a range of transferable and sector skills. Centres may choose to use different suitable forms for evidence to those proposed. Overall, learners should be assessed using varied forms of evidence.

The main forms of evidence include:

- observation and recordings of practical tasks or performance in the workplace with supporting evidence
- projects
- recordings of role play, interviews and other types of simulated activity
- oral or written presentations with assessor questioning
- work logbooks and reflective journals.

It is important to note that an observation record is a source of evidence and does not confer an assessment decision. It must be sufficiently detailed to enable others to make a judgement about the quality and sufficiency of the performance and must document clearly the rationale for the assessment decision. Observation records should be accompanied by supporting evidence, which may take the form of videos, audio recordings, photographs, preparation notes, learner logs and other similar types of record.

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
- the learner to produce evidence that is their own independent work
- a verifier to independently reassess the learner to check the assessor's decisions.

Centres need to take particular care in ensuring that learners produce independent work.

Making valid assessment decisions

Assessment decisions through applying unit-based criteria

Assessment decisions for this qualification are based on the specific criteria given in each unit and set at each grade level. The way in which individual units are written provides a balance of assessment of sector-specific knowledge, technical and practical skills, and transferable skills appropriate to the purpose of the qualification.

Pass, Merit and Distinction criteria all relate to individual learning aims. The assessment criteria for a unit are hierarchical and holistic where, in satisfying the Merit criteria, a learner would also have satisfied the Pass criteria. The unit assessment grid shows the relationships of the criteria so that assessors can apply all the criteria to the learner's evidence at the same time.

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 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 all 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 all 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 2 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.

Making assessment decisions using criteria

As an assessor, you review authenticated learner work and make judgements on standards using the assessment criteria and the supporting information provided in units and training materials. 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.

Assessors should use the following information and support in reaching assessment decisions:

- the *Essential information for assessment decisions* section in each unit
- your Lead IV and assessment team's collective experience, supported by the standardisation materials we provide.

Once the team has agreed the outcome, a formal assessment decision is recorded and reported to learners. The information given:

- must show the formal decision and indicate where criteria have been met
- may show where attainment against criteria has not been demonstrated
- must avoid giving direct, specific instructions on how the learner can improve the evidence to achieve a higher grade.

Authenticity of learner 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.

Once an assessment has begun, learners must not be given feedback that relates specifically to their evidence and how it can be improved, learners must work independently.

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 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 Administrative arrangements*.

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 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 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.

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 did not complete assignments by your planned deadline or an authorised extension deadline, if one was given for specific circumstances, may not have the opportunity to subsequently resubmit. Similarly, learners who submit work that is not their own should not be given an opportunity to resubmit.

The outcome of any resubmission of the assignment by the learner is then recorded as the final decision.

A learner who has not achieved their expected level of performance in the relevant learning aims **after resubmission** of an assignment may be offered a single retake opportunity using a new assignment. The highest grade that may be awarded is a Pass.

The Lead IV must authorise a retake with a new assignment only in exceptional circumstances and where 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 Internal Assessment* available on our website. We provide information on writing assignments for retakes on our website (please go to www.btec.co.uk/keydocuments).

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 assessment. You need to refer to our *Information Manual* for information on making registrations for the qualification.

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

Internal assessments need to be administered carefully to ensure that all learners are treated fairly and that results and certificates are issued on time to allow learners to progress to chosen progression opportunities.

Our Equality Policy requires that all learners 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 (as defined by the Equality Act 2010) are not, when they are undertaking one of our qualifications, disadvantaged in comparison to learners who do not share that characteristic
- all learners achieve the recognition they deserve for undertaking a qualification and 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 our *Information Manual.* Records must be maintained as specified as we may ask to audit them.

Reasonable adjustments to assessment

To ensure that learners have fair access to demonstrate the requirements of the assessments, a reasonable adjustment is one that is made before a learner takes an assessment. 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 only 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 being conducted unfairly. 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*.

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 our *Centre guide for dealing with malpractice and maladministration in vocational qualifications*, available on our website.

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. Our *Centre guide for dealing with malpractice and maladministration in vocational qualifications* 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.

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:

- 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 or 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 units for a qualification, 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

Qualification results will be issued once a learner has completed all components of the qualification and you have claimed certification. 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.

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 and claiming certificates.
- 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 robust assessment, internal verification and planning of appropriate employer involvement.

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 Technical Certificate and Diploma qualifications include:

- making sure that all centres complete appropriate declarations at the time of approval
- undertaking centre approval visits
- 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.

Centres that do not fully address and maintain rigorous approaches to delivering, assessing and quality assurance cannot seek certification for individual programmes or for the BTEC Technical Certificate and Diploma qualifications. 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 providing an overall qualification grade for each learner. The final grade awarded for a qualification represents a holistic performance across all of 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 will be balanced by a lower outcome in others.

Eligibility for an award

In order to be awarded the qualification, a learner must complete all units and achieve a Pass or above in all units. See *Section 2 Structure* for full details.

To achieve the qualification grade, learners must:

- achieve and **report a grade** (D, M or P) for all units within a valid combination
- achieve the **minimum number of points** at a grade threshold.

Where there are optional units in a qualification, it is the responsibility of the centre to ensure that a correct unit combination is adhered to. Learners who do not pass all the required units shown in the structure will not achieve the qualification. For example, learners who have not taken enough mandatory or optional units will not achieve that qualification even if they have enough points.

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 (where available), 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.

The qualification is awarded at the grade ranges shown in the table below.

Qualification	Available grade range
Diploma	PP to DD

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. Our *Information Manual* gives full details.

Points available for internally-assessed units

The table below shows the number of **points** available for internally-assessed units. For each internally-assessed unit, points are allocated depending on the grade awarded.

	Unit size	
	30 GLH	**60 GLH**
U	0	0
Pass	8	16
Merit	12	24
Distinction	16	32

Claiming the qualification grade

Subject to eligibility, we will automatically calculate the qualification grade for your learners when the internally-assessed 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 table

Diploma	
Grade	**Points threshold**
PP	96
MP	112
MM	128
DM	152
DD	176

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 2018

Example 1: Achievement of a Diploma with a PP grade

Unit	GLH	Type	Grade	Points
1	60	Internal	Merit	24
2	60	Internal	Pass	16
3	60	Internal	Pass	16
4	30	Internal	Pass	8
6	30	Internal	Pass	8
7	30	Internal	Pass	8
9	30	Internal	Pass	8
11	60	Internal	Pass	16
	360		**PP**	**104**

The learner has achieved a Pass or above in all units.

The learner has sufficient points for a PP grade.

Example 2: Achievement of a Diploma with a DD grade

Unit	GLH	Type	Grade	Points
1	60	Internal	Merit	24
2	60	Internal	Merit	24
3	60	Internal	Distinction	32
4	30	Internal	Distinction	16
6	30	Internal	Distinction	16
7	30	Internal	Distinction	16
9	30	Internal	Distinction	16
11	60	Internal	Distinction	32
	360		**DD**	**176**

The learner has sufficient points for a DD grade.

Example 3: Achievement of a Diploma with an Unclassified result

Unit	GLH	Type	Grade	Points
1	60	Internal	Merit	24
2	60	Internal	Merit	24
3	60	Internal	Unclassified	0
4	30	Internal	Pass	8
6	30	Internal	Pass	8
7	30	Internal	Pass	8
9	30	Internal	Pass	8
11	60	Internal	Distinction	32
	360		**U**	**112**

The learner has a U in Unit 3.

The learner has sufficient points for a P/MP but has not met the requirement for a Pass, or above, in all units.

10 Resources and support

Our aim is to give you support to enable you to deliver Pearson BTEC Level 2 Technicals with confidence. You will find resources to support teaching and learning, assessing, and professional development on our website.

Support for setting up your course and preparing to teach

Schemes of Learning

Our free Schemes of Learning give you suggestions and ideas for how to deliver the units in the qualifications, including opportunities to develop employability skills, tips on embedding mathematics and English, and how to link units through holistic assessments.

Delivery planner

High-level models showing how the course can be delivered over different timescales, for example six months, one year, two years.

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 BTEC qualifications 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 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.

Support for teaching and learning

Work Experience Toolkit

Our free Work Experience Toolkit gives guidance for tutors, assessors, work-based supervisors and learners on how to make the most of work placements and work experience.

Pearson Learning Services provides a range of engaging resources to support BTEC qualifications.

Teaching and learning resources may also be available from a number of other publishers. Details of Pearson's own resources and of all endorsed resources are on our website.

Support for assessment

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.

We provide assignment briefs approved by Pearson Standards Verifiers.

Sample marked learner work

To support you in understanding the expectation of the standard at each grade, examples of sample marked learner work will be made available on our website.

Training and support from Pearson

People to talk to

There are lots of people who can support you and give you advice and guidance on delivering your Pearson BTEC Level 2 Technicals. They include the following.

- Standards Verifiers – they can support you with preparing your assignments, ensuring that your assessment plan is set up correctly, in preparing learner work and providing quality assurance through sampling.
- 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.
- Curriculum Development Managers (CDMs) – they are regionally based and have a full overview of BTEC qualifications and of the support and resources that Pearson provides. CDMs often run network events.
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