

Unit 7: Undertake Identification, Selection and Use of Ornamental Plants

Unit code:	H/600/9982
QCF Level 3:	BTEC National
Credit value:	10
Guided learning hours:	60

● Aim and purpose

This unit aims to provide learners with an understanding of how to undertake identification, selection and use of ornamental plants and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

● Unit introduction

The need to improve plant use and knowledge of plant protection has become more important as environmental awareness of, and the demand for, high quality landscapes have developed in the UK. People employed in plant and countryside industries often need knowledge and skills to undertake soft landscaping and design projects that are economically viable and environmentally beneficial in relation to landscape, production goals and/or conservation.

This unit allows learners to build a clear picture of how plants react and grow in different sites. Learners will be taught about individual plants, and the unit content will give them an in-depth knowledge and understanding of plants. This information is important in helping those involved in plant and countryside industries choose the correct plants for the different sites that are developed in the UK.

Learners will carry out surveys to facilitate plant identification using appropriate methods. They will also look at characteristics that aid identification and indicator species that identify abiotic characteristics of the site, along with methods for planning, designing and costing planting schemes. Learners will undertake practical tasks to protect and maintain vegetation in a variety of settings to achieve the objectives of the site. Relevant, current legal requirements will be covered in relation to health and safety and environmental protection.

● Learning outcomes

On completion of this unit a learner should:

- 1 Be able to identify plants
- 2 Understand the factors that affect the selection of plants
- 3 Be able to prepare ornamental planting designs
- 4 Understand the planting of trees and shrubs
- 5 Know the aftercare requirements of ornamental plants.

Unit content

1 Be able to identify plants

Botanical names: genus; species; variety/cultivar; correct use of scientific nomenclature protocols

Range of plants: appropriate sector-specific range eg acid soil tolerant plants, alkaline soil tolerant plants, hedging plants, deciduous trees, conifers, shrubs, ground cover, herbaceous, ephemeral, native, non-native, climbers, plants for full sun, shade; seasons interest, autumn foliage and fruiting, wildlife value, aquatic and marginal plants, sensory plants

2 Understand the factors that affect the selection of plants

Abiotic: requirements (soil texture, drainage); soil pH; soil depth; nutrient requirements; shade tolerance; hardiness; plant and abiotic interaction

Range of plants: appropriate sector-specific range eg acid soil tolerant plants, alkaline soil tolerant plants, hedging plants, deciduous trees, conifers, shrubs, ground cover, herbaceous, ephemeral, native, non-native, climbers, plants for full sun, shade; seasons interest, autumn foliage and fruiting, wildlife value, aquatic and marginal plants, sensory plants, plants as windbreaks or sound/security barriers

3 Be able to prepare ornamental planting designs

Given purpose: appropriate for a given sector, eg recreation sites, habitat value, amenity woodland, production woodland, multifunctional woodland, recreational fisheries, interpretation and education sites, traditional landscape vistas

Design: appropriate planting taking account of features, eg form, function, habit, texture, colour, scent, size of plants, maintenance requirements

Plan: Bill of Quantities; plant numbers; plant sizes; suitable suppliers; plant unit costs; scale

4 Understand the planting of trees and shrubs

Planted sites: practical tasks to be undertaken in eg recreation sites, habitat value, amenity woodland, production woodland, multifunctional woodland, recreational fisheries, interpretation and education sites, traditional landscape vistas; current relevant legislation and codes of practice eg Control of Pesticides Regulations 1986, The Wildlife and Countryside Act 1981, Countryside and Rights of Way Act 2000

5 Know the aftercare requirements of ornamental plants

Protection tasks: staking; weed control; pest identification and control; diseases (identification, control); frost protection; health and safety; risk assessment; personal protective equipment (PPE)

Maintenance tasks: cultivation; feeding; irrigation; weed control; pruning (coppicing, pollarding, crown lifting) mulching; dead-heading; health and safety; risk assessment; PPE

Assessment and grading criteria

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

Assessment and grading criteria		
To achieve a pass grade the evidence must show that the learner is able to:	To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:	To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:
P1 identify 200 plants by botanical names as appropriate to industry setting	M1 describe how characteristic plant components, which aid identification, can help in deciding a plant's suitability for a particular use	D1 discuss the importance of plant taxonomy and classification
P2 explain the classification of plants, from kingdom to variety and cultivar, and including inter-specific and bi-generic hybrids	M2 independently produce a checklist that could be used to assess a plant's suitability for a specific use	D2 discuss the interaction of selected plants with their abiotic environment
P3 describe the use of botanical and morphological features and keys in the identification of plants		
P4 evaluate the suitability of plants in relation to the following: <ul style="list-style-type: none"> ◇ climate and microclimate ◇ soil and drainage ◇ infrastructure ◇ feasibility and cost effectiveness 		
P5 evaluate the aesthetic value of plants and plant combinations <ul style="list-style-type: none"> ◇ rural/urban ◇ underground and overground services ◇ paths, highways, right-of-way 		
P6 describe the plant factors that influence selection, size and shape, possible seasonal nuisance, aesthetic merit and maintenance requirements	M3 prepare a Bill of Quantities for a selected planting scheme	D3 evaluate a selected planting scheme and its costings and suggest recommendations for improvement.

Assessment and grading criteria		
To achieve a pass grade the evidence must show that the learner is able to:	To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:	To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:
P7 evaluate site conditions in preparation for planting designs		
P8 prepare planting designs which are appropriate for the site, including temporary and permanent displays		
P9 review the categories of planting stock		
P10 evaluate the equipment available for planting trees and the suitability of specific equipment for different situations		
P11 evaluate the use of conditioners and ameliorants in tree planting, including fertilisers, organic materials, mycorrhizae and water retention materials	M4 prepare a full year's maintenance schedule for a selected planted site.	
P12 describe methods of protecting and supporting trees, including shelters, fences, tree cages, and tree guards		
P13 describe the aftercare requirements of planted areas, including inspection, nutrition, watering, mulching, and adjustment/removal of supports.		

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

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

Essential guidance for tutors

Delivery

Delivery of this unit will involve practical assessments, written assessment, visits to suitable collections and will link to work experience placements.

Tutors delivering this unit have opportunities to use as wide a range of techniques as possible. Lectures, discussions, seminar presentations, visits to plant collections and other relevant sites, supervised identification, maintenance and protection practicals, internet and/or library-based research, and the use of personal and/or industrial experience would all be suitable. Delivery should stimulate, motivate and educate learners.

Work placements should be monitored regularly in order to ensure the quality of the learning experience. It would be beneficial if learners and supervisors were made aware of the requirements of this unit before any work-related activities are undertaken, so that naturally occurring evidence can be collected at the time. For example, learners may have the opportunity to carry out plant maintenance and they should ask for observation records and/or witness statements to be provided as evidence of this. Guidance on the use of observation records and witness statements is provided on the Edexcel website.

Visiting expert speakers could add to the relevance of the subject for learners. For example, a countryside ranger, a head gardener or a landscape architect could talk about their work, the situations they face and the methods they use to enhance the landscape and wildlife habitat, the habitat value of a site for game and how to maintain year round interest for visitors in their place of work.

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

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

Outline learning plan

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

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

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

Topic and suggested assignments/activities and/assessment
Introduction to and overview of the unit and its relevance to the industry.
Assignment 1: Plant Identification (P1, P2, P3, M1, D1) Tutor introduces the assignment brief.
Introduce methods and techniques used in plant identification; types of plants to be used; learners to develop required skills and techniques.
Assignment 2: Plant Use (P4, P5, M2, D2) Tutor introduces the assignment brief.

Topic and suggested assignments/activities and/assessment

Discuss what factors influence the choice of plants used on a site.

Theory session: introduce different types of habitat, their purpose and identify how this relates to the choice of plants for the site.

Practical session using local habitat to identify relevant features.

Discuss importance of correct choice of planting material

Learners to evaluate the habitat and suggest improvements.

Assignment 3: Designing a Planting Scheme (P6, P7, P8, P9, P10, M3, D3)

Tutor introduces the assignment brief.

Theory session: the application of plant knowledge in the planning and design of a planted site.

Learners may be able to use data they have collected themselves while carrying out identification surveys, or they may use case study materials. Delivery techniques should be varied and can be linked to Assignment 2. It is expected that formal lectures, discussions, and site visits to a range of different vocationally relevant sites will form part of the delivery of this assignment. Discuss the importance of health and safety and plant health regulations.

Assignment 4: Planting and Aftercare (P11, P12, P13, M4)

Tutor introduces the assignment brief.

Learners to assess the methods commonly used to protect and maintain planted sites. Delivery techniques should be varied. It is expected that supervised vegetation protection and maintenance practicals and site visits would form a major part of this assignment. Formal lectures and demonstrations may also be used.

Learners to identify relevant health and safety issues as they apply to this assignment.

Unit review.

Assessment

For P1, P2 and P3, learners must provide information on plants from given habitats. Tutors should identify the habitats or agree them through discussion with learners. It is expected that, as a minimum, learners will provide evidence covering at least 200 plants. Learners are not required to identify plants from all the plant ranges listed in the unit content. Evidence for this could be a pictorial presentation with notes (possibly using appropriate software or an overhead projector), an annotated poster or a project. Alternatively, it could be linked to assessment for M2.

P4 and P5 require learners to evaluate selected plants. Tutors could identify the plants, which are likely to be determined by the requirements of learners' vocational specialisms. Learners do not need to cover plants from all of the plant ranges listed in the unit content. Assessment could be carried out directly by the tutor during practical activities. If this format is used then suitable evidence from guided activities would be observation records completed by learners and the tutor.

For P6, P7, P8, P9, P10 and P11, learners could draw up a scale plan and planting scheme for a selected site. Learners should use the knowledge gained in P1-P5 to inform their plans. Evidence for this will take the form of a planting map on a scale plan of the selected site.

For P12, learners must describe methods of protecting and maintaining sites and the types of equipment needed. Evidence for this could take the form of a pictorial presentation with notes (possibly using appropriate software or an overhead projector) or an annotated poster.

For P13, learners should provide a description of appropriate protection and maintenance tasks for selected planted sites. Tutors should identify the planted sites which are relevant to the learners' vocational specialisms. This assessment could be carried out directly by the tutor during practical activities.

For M1, learners must describe how characteristic plant components, which aid identification, can help in deciding a plant's suitability for a particular use. Learners may contextualise within their vocational specialism, for example woodland management or game management, or they may provide evidence that is general in nature. Evidence presented must be broad ranging, realistic and useful in aiding decision making. Evidence for this could take the form of a pictorial presentation with notes (possibly using appropriate software or an overhead projector), an annotated poster or through discussion with the tutor.

For M2, learners complete a checklist, from information obtained in M1, that will allow a quick selection of plants that would be suitable for a given site. Evidence would be in the form of the completed checklist.

For M3, learners must prepare a Bill of Quantities for a selected planting scheme. Tutors should identify the planting scheme or agree it through discussion with learners. The planting scheme could be the same as the one identified for P8. Evidence is likely to be in the form of a written proposal.

For M4, learners must prepare a full year's maintenance schedule for a selected planted site. Tutors should identify the planted site or agree it through discussion with learners (the site could be the one used for P8 and M3). The situation may be the same as that used to provide evidence for other Assessment and grading criteria. Evidence may be in the same format as for M3 or as a timetable or calendar.

For D1, learners must discuss the importance of plant taxonomy and plant classification. Learners could contextualise their evidence as described for M1. Evidence may be in the same format as for M1.

For D2, learners must discuss the interaction of selected plants with their abiotic environment. Tutors should identify the plants or agree them through discussion with learners. Learner evidence should be broad ranging, with examples of the type of interactions that occur in natural ecosystems. Learners could contextualise this within their chosen site for P8/M3. Evidence may be in the same format as for M1.

For D3, learners must evaluate a selected planting scheme and its costings and suggest recommendations for improvement. Tutors could identify the planting scheme or agree this through discussion with learners. This could be the planting scheme produced for P8 and an evaluation of the costings produced for M3. Evidence may be in the form of a summary report.

Programme of suggested assignments

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

Criteria covered	Assignment title	Scenario	Assessment method
P1, P2, P3, M1, D1	Plant Identification	Research the relevant skills and techniques used in plant identification.	Pictorial presentation with notes (possibly using appropriate software or an overhead projector). Annotated poster. Project.
P4, P5, M2, D2	Plant Use	Using information collected produce a checklist that will aid decision making.	Observation records completed by learners and the tutor. Written report.
P6, P7, P8, P9, P10, M3, D3	Designing a Planting Scheme	Draw up a scale plan and planting scheme for a selected site using knowledge of abiotic preferences and plant identification to inform plans.	Production of a planting map, written proposal and summary report.

Criteria covered	Assignment title	Scenario	Assessment method
PI1, PI2, PI3, M4	Planting and Aftercare	Carry out appropriate planting and maintenance tasks for selected planted sites.	A pictorial presentation. Annotated poster. Direct observation by the tutor during practical activities. Written proposal/timetable.

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

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

Level 2	Level 3
Participate in Protected Horticultural Plant Production	PH14 Identify and classify plants accurately using their botanical names
Participate in Horticultural Crop Production Outdoors	Establish and Manage Exterior Plant Displays
	Establish and Manage Interior Plant Displays
	Undertake Horticultural Production Techniques-Outdoor
	Undertake Horticultural Production Techniques-Protected
	Understand the Principles of Plant Health and Protection

Essential resources

Learners will need access to a range of different habitat types and sites. A full range of keys and identification guides should be made available and a range of trees, shrubs and herbaceous plants must be available for use in plant identification. Sites suitable for planning proposals should be accessible. There is also a need for areas which allow learners to gain practical experience of plant protection and vegetation maintenance. Relevant tools, equipment, materials and PPE are also essential requirements.

Tutors delivering this module should be competent and experienced in plant use and protection.

Employer engagement and vocational contexts

This unit focuses on practical aspects of plant identification, selection and use and will give learners background knowledge relating to a variety of skills and techniques. Centres are encouraged to create and develop links with local head gardeners, landscape architects and organisations such as the Forestry Commission. This could lead to visits from specialist lecturers or visits to managed woodland. When learning about the skills and techniques involved, learners could be encouraged to gain work experience with a local landscaping company.

Indicative reading for learners

Textbooks

Adams C R and Early M P- *Principles of Horticulture* (Butterworth-Heinemann, 2004) ISBN 978-0750660884

Hessayon D G - *The Tree and Shrub Expert* (Expert Books, 1993) ISBN 978-0903505177

Hubbard C — *Grasses: A Guide to Their Structure, Identification, Uses and Distribution in the British Isles* (Penguin Books, 1992) ISBN 978-0140132279

Rose F and O'Reilly C — *The Wild Flower Key: How to Identify Wild Plants, Trees and Shrubs in Britain and Ireland* (Penguin Books, 2006) ISBN 978-0713672398.

Starr C — *Woodland Management: A Practical Guide* (The Crowood Press, 2005) ISBN 978-1861267894

Websites

www.english-nature.org.uk English Nature

www.field-studies-council.org The Field Studies Council

www.saps.plantsci.cam.ac.uk Science and Plants for Schools

Functional Skills – Level 2

Skill	When learners are ...
ICT – Use ICT systems	
Select, interact with and use ICT systems independently for a complex task to meet a variety of needs	using the internet to research appropriate techniques for identifying plants using the internet to research information on plant/environment relationships
Use ICT to effectively plan work and evaluate the effectiveness of the ICT system they have used	
Manage information storage to enable efficient retrieval	
Follow and understand the need for safety and security practices	
Troubleshoot	
ICT – Find and select information	
Select and use a variety of sources of information independently for a complex task	
Access, search for, select and use ICT-based information and evaluate its fitness for purpose	
ICT – Develop, present and communicate information	
Enter, develop and format information independently to suit its meaning and purpose including: <ul style="list-style-type: none"> • text and tables • images • numbers • records 	producing written assessments using ICT programmes
Bring together information to suit content and purpose	
Present information in ways that are fit for purpose and audience	
Evaluate the selection and use of ICT tools and facilities used to present information	
Select and use ICT to communicate and exchange information safely, responsibly and effectively including storage of messages and contact lists	

Skill	When learners are ...
Mathematics	
Understand routine and non-routine problems in a wide range of familiar and unfamiliar contexts and situations	
Identify the situation or problem and the mathematical methods needed to tackle it	producing a scale plan of the site
Select and apply a range of skills to find solutions	producing a Bill of Quantities from the plan
Use appropriate checking procedures and evaluate their effectiveness at each stage	
Interpret and communicate solutions to practical problems in familiar and unfamiliar routine contexts and situations	
Draw conclusions and provide mathematical justifications	
English	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	presenting their reports on the methods and techniques used in plant identification, selection and use
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	presenting their reports on the methods and techniques used in plant identification, selection and use.