

Unit 33: Understanding and Working with Groundcare Equipment

Unit code:	T/601/4264
QCF Level 3:	BTEC National
Credit value:	10
Guided learning hours:	60

● Aim and purpose

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

● Unit introduction

The need for efficient and effective equipment to establish and maintain and cut grass for outdoor sport and leisure activities has become increasingly important. Organisations and people are demanding higher quality outdoor playing surfaces. As a result the groundcare industry has developed a range of equipment to meet this need.

This equipment has similar operating principles to that used in agricultural grass management, but has a considerably different range of tasks to perform. Service engineers need to acquire specialist knowledge and skills to maintain and repair this equipment.

In this unit learners will develop the knowledge and skills needed to understand the purpose and operation of groundcare machinery. Health and safety issues encountered when carrying out service and repair activities will be emphasised through continual risk assessment.

● Learning outcomes

On completion of this unit a learner should:

- 1 Understand the purpose and operation of groundcare equipment
- 2 Be able to operate groundcare equipment
- 3 Be able to maintain and repair equipment to establish and maintain grass surfaces
- 4 Be able to maintain and repair equipment used to cut grass.

Unit content

1 Understand the purpose and operation of groundcare equipment

Grass surface establishment equipment: principles of operation eg ploughs, subsoilers, tined cultivators non-power driven, power driven cultivators, pedestrian and tractor powered, grass seed drills

Grass maintenance equipment: principles of operation eg spikers, slitters, aerators, turf drainers, brushes, drag mats, top dressers, overseeders, white line markers

Grass cutting equipment: principles of operation eg cylinder mowers, rotary mowers, flail mowers, pedestrian controlled, ride-on, tractor mounted, trailed

2 Be able to operate groundcare equipment

Operation: pre-start procedure; safe operation; operator adjustments; lubrication; post-use cleaning and storage; effects of incorrectly operated machinery (short- and long-term damage to turf or grass, commercial impacts)

Health and safety: risk assessment; COSHH; disposal of waste

3 Be able to maintain and repair equipment to establish and maintain grass surfaces

Grass surface establishment machinery: tine replacement; power units; transmission units; safety guarding; lubrication; calibration; manufacturers' recommended testing procedures; faulty components; maintenance; repair; faults and component failure eg poor maintenance, operator error, component fatigue, excessive use, ground conditions

Grass maintenance machinery: tine replacement; power units; transmission units; safety guarding; lubrication; calibration; manufacturers' recommended testing procedures; faulty components; maintenance; repair; faults and component failure eg poor maintenance, operator error, component fatigue, excessive use, ground conditions

4 Be able to maintain and repair equipment used to cut grass

Domestic grass cutting equipment: power units; transmission units; cutting mechanisms; safety guarding; manufacturers' recommended testing procedures; faulty components; maintenance; repair; faults and component failure eg poor maintenance, operator error, component fatigue, excessive use, ground conditions

Professional grass cutting equipment: power units; transmission units; cutting mechanisms; safety guarding; on highway requirements; manufacturers' recommended testing procedures; faulty components; maintenance; repair

Assessment and grading criteria

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

Assessment and grading criteria		
To achieve a pass grade the evidence must show that the learner is able to:	To achieve a merit grade the evidence must show that, in addition to the pass criteria, the learner is able to:	To achieve a distinction grade the evidence must show that, in addition to the pass and merit criteria, the learner is able to:
P1 explain the principles of operation of given grass surface establishment and maintenance equipment [IE, CT, SM, RL]	M1 discuss the effective use and limitations of grass surface establishment, maintenance and grass cutting equipment	D1 evaluate grass surface establishment, maintenance and grass cutting equipment in the contexts of 'user friendliness' and fitness for purpose
P2 explain the principles of operation of given grass cutting equipment [IE, CT, SM, RL]		
P3 safely operate given grass surface establishment and maintenance equipment [IE, CT, RL, SM]		
P4 safely operate given grass cutting equipment [IE, CT, RL, SM]	M2 explain methods of adjusting mechanisms of grass surface establishment, maintenance and grass cutting equipment	
P5 safely carry out (using manufacturers' service data) routine maintenance of equipment to given objectives [EP, TW, SM, IE]		
P6 safely repair equipment to given objectives [EP, TW, SM, IE]	M3 carry out manufacturers' recommended testing procedures to determine faulty components in selected turf establishment and turf maintenance machinery	D2 explain causes of, and solutions to, faults or component failure in grass surface establishment, maintenance and grass cutting equipment.
P7 safely carry out (using manufacturers' service data) routine maintenance of equipment used to cut grass [EP, TW, SM, IE]	M4 carry out manufacturers' recommended testing procedures to determine faulty components in selected grass cutting machinery.	
P8 safely repair equipment used to establish and maintain grass surfaces. [EP, TW, SM, IE]		

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 industrial experience placements.

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

Work placements should be monitored regularly 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 so that naturally occurring evidence can be collected at the time. For example, learners may have the opportunity to repair a piece of groundcare equipment and they should be encouraged to 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.

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

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

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

Learning outcome 1 is likely to be delivered through formal lectures, discussion, site visits and independent learner research.

Learning outcome 2 covers the methods and associated activities commonly used in the operation of groundcare equipment. Delivery is likely to be through formal lectures, supervised practical sessions, site visits and independent learner research. Visiting expert speakers could add to the relevance of the subject for learners. For example, greenkeepers or groundcare machinery demonstrators could talk about their work, the situations they face and the methods they use.

Learning outcomes 3 and 4 develop the skills needed to maintain and repair groundcare equipment. Delivery techniques should be varied and can be linked to the delivery of learning outcomes 1 and 2. It is expected that practical activities will form part of the delivery of this learning outcome. Visiting expert speakers could add to the relevance of the subject for learners. For example, land-based machinery technicians or workshop managers could talk about their work and the techniques they use with groundcare equipment.

Outline learning plan

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

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

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

Topic and suggested assignments/activities and/assessment

Introduction to the unit.

Assignment 1: Understand the Purpose and Operation of Groundcare Equipment (P1, P2, M1)

Introduction to the assignment and learner-centred research.

Discuss and evaluate the effective use and limitations of groundcare equipment.

Assignment 2: Operate Groundcare Equipment (P3, P4, M2 D1)

Introduction to the assignment and learner-centred research.

Explain methods of adjusting mechanisms of groundcare equipment.

Assignment 3: Maintain and Repair Equipment to Establish and Maintain Grass Surfaces (P5, P6, M3, D2)

Introduction to the assignment and learner-centred research.

Explain causes of, and solutions to, faults or component failure in groundcare equipment.

Assignment 4: Maintain and Repair Equipment Used to Cut Grass (P7, P8, M4)

Introduction to the assignment and learner-centred research.

Unit review.

Assessment

For P1 and P2, learners must explain the principles of operation for grass surface establishment, maintenance and cutting equipment. Tutors should identify the machinery or agree it through discussion with learners. Where possible, to ensure fairness of assessment the size and complexity of the tasks should be the same for all learners. It is expected that, as a minimum, learners will provide evidence covering one turf establishment, one turf maintenance and one grass cutting machine. Evidence could take the form of a pictorial presentation with notes (possibly using appropriate software or an overhead projector), or an annotated assignment. Alternatively, it could be assessed verbally using appropriate visual aids within a workshop environment.

P3 and P4 require learners to operate grass surface establishment, maintenance and cutting equipment. Tutors should identify the equipment or agree it through discussion with learners. Where possible, to ensure fairness of assessment the size and complexity of the tasks should be the same for all learners. It is expected that, as a minimum, learners will provide evidence covering one turf establishment, one turf maintenance and one grass cutting machine. This could be assessed through a written assignment or 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. If assessed during a work placement, witness statements should be provided by a suitable representative and verified by the tutor.

For P5 and P7, learners must maintain grass surface establishment, maintenance and cutting equipment to manufacturers' specifications. Tutors should identify the machinery or agree it through discussion with learners. Where possible, to ensure fairness of assessment the size and complexity of the tasks should be the same for all learners. It is expected that, as a minimum, learners will provide evidence covering one turf establishment, one turf maintenance and one grass cutting machine. Learners should ensure health and safety procedures are adhered to at all times. Evidence may be in a similar form to that suggested for P3 and P4.

For P6 and P8, learners must repair grass surface establishment, maintenance and cutting equipment. Tutors should identify the machinery or agree it through discussion with learners. Where possible, to ensure fairness of assessment the size and complexity of the tasks should be the same for all learners. It is expected that, as a minimum, learners will provide evidence covering one turf establishment, one turf maintenance and one grass cutting machine. Learners should ensure health and safety procedures are adhered to at all times. Evidence may be in a similar form to that suggested for P3 and P4.

For M1, learners must discuss the effective use and limitations of grass surface establishment, maintenance and grass cutting equipment. Learners should show an understanding the effect the machine will have when in use and its limitations. It is important that learners are aware of the safe use of machines. It is expected that, as a minimum, learners will provide evidence covering one turf establishment, one turf maintenance and one grass cutting machine. Evidence could be in the form of written reports or recorded during practical activities using observation records and/or witness statements. Evidence may be in a similar form to that suggested for P3 and P4.

For M2, learners must explain methods of adjusting mechanisms of grass surface establishment, maintenance and cutting equipment. Tutors should identify the machinery or agree it through discussion with learners. Where possible, to ensure fairness of assessment the size and complexity of the tasks should be the same for all learners. It is expected that, as a minimum, learners will provide evidence covering one turf establishment, one turf maintenance and one grass cutting machine. Evidence could be in a similar format to that suggested for P3 and P4.

M3 and M4 require learners to carry out manufacturers' recommended testing procedures to determine faulty components in grass surface establishment, maintenance and cutting equipment. Tutors should identify the machinery or agree it through discussion with learners. This could be the same machinery used for P5 and P7. Where possible, to ensure fairness of assessment the size and complexity of the tasks should be the same for all learners. Evidence may be in the same format as for P5 and P7.

For D1, they must evaluate grass surface establishment, maintenance and cutting equipment for user friendliness and fitness for purpose. Tutors should identify the machinery or agree it through discussion with learners. Where possible, to ensure fairness of assessment the size and complexity of the machinery should be the same for all learners. It is expected that, as a minimum, learners will provide evidence covering two turf establishment, two turf maintenance and two grass cutting machines. Evidence could be in the format of tabulated data, notes from discussions and written reports.

D2 requires learners to explain causes of, and solutions to, faults or component failure in grass surface establishment, maintenance and cutting equipment. These are likely to be as a result of poor maintenance, operator error, component fatigue, excessive number of hours worked or ground conditions.

Tutors should identify the machinery or agree it through discussion with learners. Where possible, to ensure fairness of assessment the size and complexity of the situation should be the same for all learners. Learners should be able to understand the cause and advise on the solution.

Programme of suggested assignments

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

Criteria covered	Assignment title	Scenario	Assessment method
P1, P2, M1, D1	Understand the Purpose and Operation of Groundcare Equipment	You are working for a turf maintenance dealership that specialises in the sale and repair of groundcare equipment. You need an understanding of the operating principles of the machinery in order to assist your work.	Assignment/report. Presentation.

Criteria covered	Assignment title	Scenario	Assessment method
P3, P4, M2	Operate Groundcare Equipment	You are working for a turf maintenance dealership that specialises in the sale and repair of groundcare equipment. You should be able to operate a range of groundcare equipment.	Practical. Report/job card/work logs.
P5, P7, M3, D2	Maintain and Repair Equipment to Establish and Maintain Grass Surfaces	You are working for a turf maintenance dealership that specialises in the sale and repair of groundcare equipment. You will need to carry out maintenance on groundcare equipment.	Practical. Report/job card/work logs.
P6, P8, M4	Maintain and Repair Equipment Used to Cut Grass	You are working for a turf maintenance dealership that specialises in the sale and repair of groundcare equipment. You will need to carry out testing and repairs to groundcare equipment.	Practical. Report/job card/work logs.

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
Service and Repair Land-based Cutting and Mowing Equipment	Service and Repair Land-based Cutting and Mowing Equipment
LEO4 Core Land-based Engineering Principles – Mechanical Principles	
LEO5 Core Land-based Engineering Principles – Tools and Equipment	
LEO8 Core Land-based Engineering Principles – Servicing and Maintenance	

Essential resources

Learners will need access to a range of groundcare equipment and simulation equipment to support practical investigation and sufficient test and repair equipment and materials to enable accurate evaluation of this equipment and its components.

Manufacturers' training videos, service manuals and test data will make a significant contribution to learner achievement.

Tutors delivering this unit should be familiar with groundcare equipment.

Employer engagement and vocational contexts

Learners could be introduced to a variety of professionals from different companies and organisations to broaden their knowledge and make the learning experience interesting and contextualised. This could be through guest lectures, work placements or off-site visits to different establishments.

Indicative reading for learners

Textbooks

Bell B – *Farm Machinery (Resource Management), 5th Edition* (Old Pond Publishing, 2005) ISBN 1903366682

Hillier V, Coombes P and Rogers D – *Hillier's Fundamentals of Motor Vehicle Technology: Powertrain Electronics, 5th Edition* (Nelson Thornes, 2006) ISBN 0748780998

Whipp J and Brooks R – *Transmission, Chassis and Related Systems (Vehicle Maintenance & Repair Series: Level 3), 3rd Edition* (Thomson Learning, 2001) ISBN 186152806X

Journal

Horticulture Weekly

Websites

www.bagma.com

British Agricultural and Garden Machinery Association

www.defra.gov.uk

Department for Environment, Food and Rural Affairs

www.howstuffworks.com

HowStuffWorks

www.hse.gov.uk

Health and Safety Executive

www.lantra.co.uk

Lantra Sector Skills Council

Delivery of personal, learning and thinking skills (PLTS)

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

Skill	When learners are ...
Independent enquirers	explaining the function of groundcare equipment explaining principles of operation
Creative thinkers	explaining the function of groundcare equipment assessing risk explaining principles of operation discussing the correct selection of components
Reflective learners	discussing the correct selection of components describing methods of fault diagnosis
Team workers	carrying out maintenance and repair work diagnosing faults using a variety of sources
Self-managers	carrying out maintenance and repair work diagnosing faults using a variety of sources
Effective participators	diagnosing faults using a variety of sources.

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

Skill	When learners are ...
Independent enquirers	planning and carrying out research activities related to the unit evaluating and carrying out extended thinking
Creative thinkers	asking questions to extend their thinking during lectures and practical sessions adapting ideas as circumstances change eg repairs on a variety of machinery
Reflective learners	identifying opportunities for their own achievements setting goals for themselves eg time management reviewing progress in practical tasks and coursework
Team workers	working with others to carry out repair and maintenance tasks reaching clear agreements regarding who is carrying out which tasks during practical activities working together when diagnosing faults
Self-managers	dealing with pressures in an emergency situation managing time and resources during practical activities
Effective participators	discussing issues of concern relating to time management and resources during practical activities identifying improvements that could be implemented during practical tasks.

● 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	completing their course work using ICT facilities using interactive materials for teaching and learning researching subjects on the internet
Use ICT to effectively plan work and evaluate the effectiveness of the ICT system they have used	
Manage information storage to enable efficient retrieval	
Follow and understand the need for safety and security practices	
Troubleshoot	
ICT – Find and select information	
Select and use a variety of sources of information independently for a complex task	
Access, search for, select and use ICT-based information and evaluate its fitness for purpose	
ICT – Develop, present and communicate information	
Enter, develop and format information independently to suit its meaning and purpose including: <ul style="list-style-type: none"> ● text and tables ● images ● numbers ● records 	
Bring together information to suit content and purpose	
Present information in ways that are fit for purpose and audience	
Evaluate the selection and use of ICT tools and facilities used to present information	
Select and use ICT to communicate and exchange information safely, responsibly and effectively including storage of messages and contact lists	

Skill	When learners are ...
Mathematics	
Understand routine and non-routine problems in a wide range of familiar and unfamiliar contexts and situations	planning an activity and getting relevant information from relevant sources
Identify the situation or problem and the mathematical methods needed to tackle it	using this information to carry out multi-stage calculations to do with, amounts or sizes, scales or proportion and using formulae
Select and apply a range of skills to find solutions	interpreting the results of calculations, presenting findings and justifying methods.
Use appropriate checking procedures and evaluate their effectiveness at each stage	
Interpret and communicate solutions to practical problems in familiar and unfamiliar routine contexts and situations	
Draw conclusions and provide mathematical justifications	
English	
Speaking and listening – make a range of contributions to discussions and make effective presentations in a wide range of contexts	reading material on the subject from a variety of sources for their assignment work
Reading – compare, select, read and understand texts and use them to gather information, ideas, arguments and opinions	reading around subjects and producing clear and concise documents using correct engineering terminology
Writing – write documents, including extended writing pieces, communicating information, ideas and opinions, effectively and persuasively	presenting information to a group of people ideally in a classroom situation with their peers.