City & Guilds Level 2 Certificate, Extended Certificate and Diploma in Agriculture (0073-02)

www.cityandguilds.com
February 2022
Version 3.1

Qualification handbook for centres
500/8584/0
500/8590/6
500/8575/X

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Version and date	Change detail	Section
3.0 August 2013	Added units 218 and 219 and certification modules 922-924	Introduction to the qualifications, Units and Registration and certification
3.1 February 2022	TQT and GLH clarified and highlighted	Introduction to the qualifications

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Contents

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1 Introduction to the qualifications

This document contains the information that centres need to offer the following qualifications:

Qualification title and level	City & Guilds qualification number	Qualification accreditation number
Level 2 Certificate in Agriculture	0073-02	500/8584/0
Level 2 Extended Certificate in Agriculture	0073-02	500/8590/6
Level 2 Diploma in Agriculture	0073-02	500/8575/X

Qualification summary

Qualification title and level	Credits	Guided Learning Hours (GLH)	Total Qualification Time (TQT)
Level 2 Certificate in Agriculture	15	90	150
Level 2 Extended Certificate in Agriculture	30	180	300
Level 2 Diploma in Agriculture	60	360	600

These qualifications meet the needs of learners in a centre-based environment who may wish to work within the agricultural industry or progress to further learning and/or training. These qualifications allow learners to develop underpinning knowledge whilst practising skills that could be used within employment in the agriculture industry. These qualifications replace the Level 2 National Certificate in Agriculture (0340-02) which expired on 31 December 2010 (QAN 100/1506/1).

These qualifications were developed in association with Lantra SSC, Landex and the industry.

Specialist Learning (SL)

Specialist Learning (SL) offers young people the opportunity to study a particular topic in more depth or broaden their studies through complementary learning. The Level 2 Certificate and Extended Certificate in Agriculture have been approved as SL by the Environmental and Land-based Diploma DDP and Ofqual for the Higher Diploma in Environmental and Land-based Studies. They have been designed to:

- complement principal learning within the Higher Diploma in Environmental and Land-based Studies
- provide a broad background understanding of the Environmental and Land-based sector and an introduction to the practical skills and knowledge required
- provide an awareness of the range of jobs and work settings in the agricultural sector
- enable learners to make an informed assessment of their own aptitude for work in this sector and to make informed decisions about careers
- encourage learners to reach a level of knowledge and skills that will facilitate progress into further vocational learning or to potential employment in the sector
- introduce learners to the discipline of the working environment and to encourage mature attitudes to the community in general
- encourage learners to value continued learning and remain in the learning process
- allow learners to learn, develop and practise selected skills required for progression in the sector
- provide opportunities for progression to the Higher Diploma in Environmental and Land-based and other related qualifications in the sector.

1.1 Qualification structure

Level 2 Certificate

To achieve the **Level 2 Certificate in Agriculture**, learners are required to achieve a total of 15 credits from any combination of Optional units in the table below.

Unit accreditation number	City & Guilds unit number	Unit title	Credit value	Excluded combination of units (if any)
Optional Units				
F6009097	Unit 204	Introduction to Farm Animal Production	10	
K6009594	Unit 206	Introduction to the Principles of Land-based Machinery	5	
K6009403	Unit 207	Introduction to Animal and Plant Husbandry	10	
D6009835	Unit 208	Tractor Driving	5	
R6009377	Unit 209	Assist with Agricultural Crop Production	10	
Y6009364	Unit 216	Participate in Providing Estate Maintenance	10	
Y5050194	Unit 218	Introduction to Dairy and Beef Cattle Husbandry	10	
L5050192	Unit 219	Introduction to Sheep Husbandry	5	

Level 2 Extended Certificate

To achieve the **Level 2 Extended Certificate in Agriculture**, learners are required to achieve a total of 30 Credits from any combination of Optional units in the table below.

Unit accreditation number	City & Guilds unit number	Unit title	Credit value	Excluded combination of units (if any)
Optional Units				
D6009382	Unit 203	Introduction to Crop Establishment	10	
F6009097	Unit 204	Introduction to Farm Animal Production	10	
T6009596	Unit 205	Introduction to Land-based Machinery Operations	10	
K6009594	Unit 206	Introduction to the Principles of Land-based Machinery	5	
K6009403	Unit 207	Introduction to Animal and Plant Husbandry	10	
D6009835	Unit 208	Tractor Driving	5	
R6009377	Unit 209	Assist with Agricultural Crop Production	10	
D6009107	Unit 210	Introduction to Grass and Forage Crop Production	10	
R6009783	Unit 211	Introduction to Animal and Plant Biology	10	
F6009794	Unit 212	Introduction to Land-based Workshop Practice	10	
K6009823	Unit 213	Assist with Agriculture Habitat Management	10	

Y6009364	Unit 216	Participate in Providing Estate Maintenance	10	
R6009380	Unit 217	Conservation and Improvement of British Habitats	10	
Y5050194	Unit 218	Introduction to Dairy and Beef Cattle Husbandry	10	
L5050192	Unit 219	Introduction to Sheep Husbandry	5	

Level 2 Diploma

To achieve the **Level 2 Diploma in Agriculture**, learners are required to achieve 20 credits from Mandatory group 1, 10 credits from Mandatory group 2 and a further 30 credits from the Optional group. A total of 60 credits are required to achieve the qualification.

Please note that learners need to take either 203 or 204 as part of the mandatory requirements, but can take the remaining one as an option if they wish to.

Unit accreditation number	City & Guilds unit number	Unit title	Credit value	Excluded combination of units (if any)
Mandatory Group 1				
H6009335	Unit 201	Undertake Work Related Experience in the Land-based Industries	10	
F6009357	Unit 202	Environmental and Land-based Business	10	
Mandatory Group 2				
D6009382	Unit 203	Introduction to Crop Establishment	10	
F6009097	Unit 204	Introduction to Farm Animal Production	10	
Optional Group				
D6009382	Unit 203	Introduction to Crop Establishment	10	
F6009097	Unit 204	Introduction to Farm Animal Production	10	
T6009596	Unit 205	Introduction to Land-based Machinery Operations	10	
K6009594	Unit 206	Introduction to the Principles of Land-based Machinery	5	
K6009403	Unit 207	Introduction to Animal and Plant Husbandry	10	

D6009835	Unit 208	Tractor Driving	5	
R6009377	Unit 209	Assist with Agricultural Crop Production	10	
D6009107	Unit 210	Introduction to Grass and Forage Crop Production	10	
R6009783	Unit 211	Introduction to Animal and Plant Biology	10	
F6009794	Unit 212	Introduction to Land-based Workshop Practice	10	
K6009823	Unit 213	Assist with Agriculture Habitat Management	10	
L6009779	Unit 214	Environmental Protection and Improvement	10	
F6009360	Unit 215	Understand British Wildlife Species, Habitats and Rehabilitation	10	
Y6009364	Unit 216	Participate in Providing Estate Maintenance	10	
R6009380	Unit 217	Conservation and Improvement of British Habitats	10	
Y5050194	Unit 218	Introduction to Dairy and Beef Cattle Husbandry	10	
L5050192	Unit 219	Introduction to Sheep Husbandry	5	

1.2 Opportunities for progression

On completion of these qualifications, learners may progress into employment or to the following City & Guilds qualifications:

- Level 3 Certificate, Subsidiary Diploma, Diploma and Extended Diploma in Agriculture
- Level 2 or 3 qualifications in Work-based Agriculture
- Other related qualifications

1.3 Qualification support materials

City & Guilds also provides the following publications and resources specifically for these qualifications:

Description	How to access
Assignment guide	www.cityandguilds.com
Marking guide	information@cityandguilds.com
Information Sheets	www.cityandguilds.com
Fast track approval forms/generic fast track approval form	www.cityandguilds.com

2 Centre requirements

This section outlines the approval processes for Centres to offer these qualifications and any resources that Centres will need in place to offer the qualifications including qualification-specific requirements for Centre staff.

Centres already offering the Level 2 National Certificate in Agriculture (0340-02)

Centres approved to offer the Level 2 National Certificate in Agriculture (0340-02) may apply for approval for the new Level 2 Certificate, Extended Certificate and Diploma in Agriculture (0073-02) using the **fast track approval form**, available from the City & Guilds website.

Centres may apply to offer the new qualifications using the fast track form

- providing there have been no changes to the way the qualifications are delivered, and
- if they meet all of the approval criteria specified in the fast track form guidance notes.

Fast track approval is available for 12 months from the launch of the qualification. After this time, the qualification is subject to the **standard** Qualification Approval Process. It is the centre's responsibility to check that fast track approval is still current at the time of application.

New centres must apply for centre and qualification approval. Further information on this process is available on the City & guilds website.

Existing City & Guilds centres that do not offer Level 2 National Certificate in Agriculture will need to get specific qualification approval to run these qualifications (contact your City & Guilds Local Office).

2.1 Resource requirements

Human resources

Staff delivering these qualifications must be able to demonstrate that they meet the following occupational expertise requirements. They should:

- be technically competent in the areas for which they are delivering training and/or have experience of providing training. This knowledge must be at least to the same level as the training being delivered
- have recent relevant experience in the specific area they will be assessing
- be occupationally knowledgeable in the area(s) of agriculture for which they are delivering training. This knowledge must be at least to the same level as the training being delivered
- have credible experience of providing training.

Centre staff may undertake more than one role, eg tutor and assessor or internal verifier, but must never internally verify their own assessments.

Assessors and internal verifiers

The centre must provide Assessor personnel who must be occupationally competent in the industry either qualified to at least level 2 and/or have current experience of working in the industry at this level.

The centre must provide Internal Quality Assurance personnel who must be occupationally competent in the land-based sector either qualified to at least level 2 and/or have current experience of working in the industry at this level.

Assessors/Internal Quality Assurance personnel may hold relevant qualifications such as D32/33/34 or A1/V1 or TAQA however they are not a mandatory requirement for this qualification. They should have had formal training in assessment/IQA, which may be the qualifications above, or other training that allows the assessor to demonstrate competence in the practice of assessment/IQA. This training may be carried out in-house or with an external agency.

TAQA qualifications are considered very appropriate as Continuing Professional Development (CPD) or as best practice standards for new centre staff to work towards.

Continuing professional development (CPD)

Centres are expected to support their staff in ensuring that their knowledge remains current of the occupational area and of best practice in delivery, mentoring, training, assessment and verification, and that it takes account of any national or legislative developments.

2.2 Learner entry requirements

There are no formal entry requirements for learners undertaking these qualifications. However, centres must ensure that learners have the potential and opportunity to gain the qualifications successfully.

As part of the assessment for the Level 2 Diploma qualification, learners must have access to a work setting/placement for the work experience unit.

2.3 Age restrictions

These qualifications have been approved and accredited for pre-16, 16-18, 18+ and 19+ learners. However, there are no age limits attached to learners undertaking the qualification unless this is a legal requirement of the process or the environment.

3 Course design and delivery

3.1 Initial assessment and induction

Centres will need to make an initial assessment of each learner prior to the start of their programme to ensure they are entered for an appropriate type and level of qualification.

The initial assessment should identify:

- any specific training needs the learner has, and the support and guidance they may require when working towards their qualifications. This is sometimes referred to as diagnostic testing
- any units the learner has already completed, or credit they have accumulated which is relevant to the qualifications they are about to begin.

City & Guilds recommends that centres provide an induction programme to ensure the learner fully understands the requirements of the qualifications they will work towards, their responsibilities as a learner, and the responsibilities of the centre. It may be helpful to record the information on a learning contract.

3.2 Recommended delivery strategies

Centre staff should familiarise themselves with the structure, content and assessment requirements of the qualifications before designing a course programme.

Centres may design course programmes of study in any way which:

- best meets the needs and capabilities of their learners
- satisfies the requirements of the qualifications.

When designing and delivering the course programme, centres might wish to incorporate other teaching and learning that is not assessed as part of the qualifications. This might include the following:

- Functional skills
- Personal learning and thinking skills (PLTS)

Where applicable, this could involve enabling the learner to access relevant qualifications covering these skills.

4 Assessment

4.1 Summary of assessment methods

For these qualifications, learners will be required to complete the following assessments:

- **one** assignment for **each** unit

City & Guilds provides the following assessments:

- Assignment guide containing assignments for each unit.

Time constraints

The following time constraints must be applied to the assessment of these qualifications:

- All assignments must be completed and assessed within the learner's period of registration. Centres should advise learners of any internal timescales for the completion and marking of individual assignments.

4.2 Assignments

The assignment guide for these qualifications is available to download from **www.cityandguilds.com**.

4.3 Recognition of prior learning (RPL)

Recognition of Prior Learning (RPL) recognises the contribution a person's previous experience could contribute to a qualification. RPL is allowed and is also sector specific.

4.4 Resubmission of Assignments

Centres are advised to adopt the following policy on the re-submission of work:

Learners who fail an assignment on the formal (summative) submission, or who would like the opportunity to improve their grade, may re-submit once only and may then achieve either a Pass, Merit or Distinction as appropriate. An appropriate time period between formal submission and re-submission should be set by the centre. Multiple re-submissions are not permitted. Learners who fail to hand in work on the formal submission date, where there is no legitimate reason, should be capped to a maximum of a Pass grade only at the re-submission stage. It is at the discretion of the centre to set informal (formative) submission dates, if appropriate, and a formal submission date.

5 Units

Summary of units

City & Guilds unit number	Title	QCF unit number	Credits
201	Undertake Work Related Experience in the Land-based Industries	H6009335	10
202	Environmental and Land-based Business	F6009357	10
203	Introduction to Crop Establishment	D6009382	10
204	Introduction to Farm Animal Production	F6009097	10
205	Introduction to Land-based Machinery Operations	T6009596	10
206	Introduction to the Principles of Land-based Machinery	K6009594	5
207	Introduction to Animal and Plant Husbandry	K6009403	10
208	Tractor Driving	D6009835	5
209	Assist with Agricultural Crop Production	R6009377	10
210	Introduction to Grass and Forage Crop Production	D6009107	10
211	Introduction to Animal and Plant Biology	R6009783	10
212	Introduction to Land-based Workshop Practice	F6009794	10
213	Assist with Agriculture Habitat Management	K6009823	10
214	Environmental Protection and Improvement	L6009779	10
215	Understand British Wildlife Species, Habitats and Rehabilitation	F6009360	10
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217	Conservation and Improvement of British Habitats	R6009380	10
218	Introduction to Dairy and Beef Cattle Husbandry	Y5050194	10
219	Introduction to Sheep Husbandry	L5050192	5

Certification/grading modules

City & Guilds unit number	Title
901	Certification module for Level 2 Certificate in Agriculture - pass grade
902	Certification module for Level 2 Certificate in Agriculture - merit grade
903	Certification module for Level 2 Certificate in Agriculture - distinction grade
904	Certification module for Level 2 Extended Certificate in Agriculture - pass grade
905	Certification module for Level 2 Extended Certificate in Agriculture - merit grade
906	Certification module for Level 2 Extended Certificate in Agriculture - distinction grade
907	Certification module for Level 2 Diploma in Agriculture - pass grade
908	Certification module for Level 2 Diploma in Agriculture - merit grade
909	Certification module for Level 2 Diploma in Agriculture - distinction grade
922	Certification module for Level 2 Certificate in Agriculture – distinction* grade
923	Certification module for Level 2 Extended Certificate in Agriculture – distinction* grade

6 Registration and Certification

924	Certification module for Level 2 Diploma in Agriculture – distinction* grade

5 Units

The Level 2 Certificate, Extended Certificate and Diploma in Agriculture qualifications have been grouped into one programme for registration.

Tutors and Examination Officers should ensure that learners are registered onto 0073-02 and that all 0073-02 documentation for teaching and administration with City & Guilds is used.

When learners' results are submitted to City & Guilds, centres should also submit the relevant Certificate, Extended Certificate and Diploma component, according to which units the learner has achieved, so that the appropriate certificate is generated. The overall grade can be calculated using the formula in the assignment guide.

Please note: There are three certification/grading modules for each of the qualifications which differentiates the three grades – pass, merit and distinction. Once the overall grade for the assignments has been calculated, the correct certification/grading module needs to be indicated on the results entry.

For example, if a learner achieves the Level 2 Certificate in Agriculture at an overall merit grade, then the certification module 902 needs to be submitted. Please see the Rules of Combination below or the City & Guilds catalogue.

Level 2 Certificate in Agriculture QAN 500/8584/0	
Rules for achievement of qualification	15 credits from 204, (206 – 209), 216, 218, 219 Plus 901 for certification at pass grade

Level 2 Certificate in Agriculture QAN 500/8584/0	
Rules for achievement of qualification	15 credits from 204, (206 – 209), 216, 218, 219 Plus 902 for certification at merit grade

Level 2 Certificate in Agriculture QAN 500/8584/0	
Rules for achievement of qualification	15 credits from 204, (206 – 209), 216, 218, 219 Plus 903 for certification at distinction grade

Level 2 Certificate in Agriculture QAN 500/8584/0	
Rules for achievement of qualification	15 credits from 204, (206 – 209), 216, 218, 219 Plus 922 for certification at distinction* grade

Level 2 Extended Certificate in Agriculture **QAN 500/8590/6**	
Rules for achievement of qualification	30 credits from (203 – 213), (216-219) Plus 904 for certification at pass grade

Level 2 Extended Certificate in Agriculture **QAN 500/8590/6**	
Rules for achievement of qualification	30 credits from (203 – 213), (216-219) Plus 905 for certification at merit grade

Level 2 Extended Certificate in Agriculture **QAN 500/8590/6**	
Rules for achievement of qualification	30 credits from (203 – 213), (216-219) Plus 906 for certification at distinction grade

Level 2 Extended Certificate in Agriculture **QAN 500/8590/6**	
Rules for achievement of qualification	30 credits from (203 – 213), (216-219) Plus 923 for certification at distinction* grade

Level 2 Diploma in Agriculture **QAN 500/8575/X**	
Rules for achievement of qualification	20 credits from (201 – 202), 10 credits from (203 – 204) plus a minimum of 30 credits from (203 – 219) Plus 907 for certification at pass grade

Level 2 Diploma in Agriculture **QAN 500/8575/X**	
Rules for achievement of qualification	20 credits from (201 – 202), 10 credits from (203 – 204) plus a minimum of 30 credits from (203 – 219) Plus 908 for certification at merit grade

Level 2 Diploma in Agriculture **QAN 500/8575/X**	
Rules for achievement of qualification	20 credits from (201 – 202), 10 credits from (203 – 204) plus a minimum of 30 credits from (203 – 219) Plus 909 for certification at distinction grade

Level 2 Diploma in Agriculture **QAN 500/8575/X**	
Rules for achievement of qualification	20 credits from (201 – 202), 10 credits from (203 – 204) plus a minimum of 30 credits from (203 – 219) Plus 924 for certification at distinction* grade

- Learners must be registered at the beginning of their course. Centres should submit registrations using Walled Garden or Form S (Registration), under scheme/complex 0073-02.

- When assignments have been successfully completed results should be submitted on Walled Garden or Form S (Results submission). One of the certification/grading modules 901 to 909, 922 to 924 need to be submitted to generate the appropriate certificate and grade. Centres should note that results will not be processed by City & Guilds until verification records are complete

- Learners achieving one or more assessment components will receive a Certificate of Unit Credit listing the assessment components achieved. Learners achieving the number and combination of assessment components required to meet a defined Rule of Combination will, in addition, be issued with a certificate. Centres must submit a certification/grading component to allow this to happen.

Full details on the procedures for all City & Guilds qualifications registered and certificated through City & Guilds can be found on the City & Guilds on-line catalogue.

Unit 201 Undertake Work Related Experience in the Land-based Industries

Level: 2

Credit value: 10

Unit aim

The aim of this unit is to give learners the skills needed to identify, participate in and review work experience in a land-based environment. The unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Know the range and scope of job roles within an environmental and land-based industry
2. Be able to use relevant documents and skills relating to work experience
3. Be able to plan and review self development during work experience
4. Be able to report on the work experience

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

n/a

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge

Unit 201 Undertake Work Related Experience in the Land-based Industries

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

Assessment Criteria

The learner can:

1. Describe different **types of jobs** within an environmental and land-based industry
2. Describe the **skills and qualifications** required for different types of jobs within an environmental and land-based industry

Unit content

Types of jobs

Types of jobs relevant to the industry: managerial, supervisory, team worker, trainee, volunteer, common job titles within the relevant industry, main duties and responsibilities

Skills needed to fulfil duties and responsibilities of appropriate jobs: job specific, vocational and personal

Skills and qualifications

Types of qualifications available to the industry, e.g. GCSE and A level, the Diploma(including Functional Skills), Apprenticeships (including Work-based Learning qualifications), Foundation Learning (Entry Level and Level 1), standalone/industry specific vocational, e.g. Centre-based (City & Guilds, Edexcel and others), practical competence based e.g. Certificates of Competence, other

Progression pathways from trainee or team worker positions to supervisory and management posts. Skills, qualifications and experience required to achieve career progression

Evaluate career and progression opportunities: advantages and disadvantages of identified pathways, suitability to personal interests, skills and qualifications, role of work experience in preparing for a selected career

Skills valued by employers: commitment and reliability, time management, people skills, confidentiality and discretion

Unit 201 Undertake Work Related Experience in the Land-based Industries

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

Assessment Criteria

The learner can:

1. Locate three advertisements for jobs from **different sources** available within the environmental and land-based industry
2. Produce an **application** for work experience in the environmental and land-based sector
3. **Prepare for an interview** for work experience
4. **Undertake an interview** for work experience

Unit content

Different sources

Locate three advertisements from for example trade magazines, websites, employer approaches to the centre, local paper, Countryside Jobs Service

Application

Suitable work experience position based on existing skills, experience, qualifications, development of skills and experience to achieve future employment goals
Personal details, education and training, professional membership, training, employment history, qualifications held, skills and general information, declarations

Prepare for an interview

Interview preparation: research the business and job role, suitable dress and personal presentation, information to find out and suitable questions to ask

Undertake an interview

Interview performance: attend punctually and dressed appropriately, answering questions, completion of other tests (e.g. practical, aptitude), and reflection on interview performance

Unit 201 Undertake Work Related Experience in the Land-based Industries

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

Assessment Criteria

The learner can:

1. **Review own skills and experience** against the requirements for a specific industry
2. Prepare a **self development plan** for work experience
3. **Review** self development plan during and after work experience

Unit content

Review own skills and experience

Current skills and experience compared with those required for the job, identify training and development needs

Self development plan

New skills, knowledge, understanding, experience, development of existing knowledge and skills, training needed

Review

Skills, knowledge, understanding and experience that have been developed during work experience, impact on technical ability to perform the job role, work as a member of a team, future employability, future employment ambitions, further training and development

Unit 201 Undertake Work Related Experience in the Land-based Industries

Outcome 4 Be able to report on the work experience

Assessment Criteria

The learner can:

1. **Gather and prepare evidence** during the work experience
2. **Present information** to others on work experience

Unit content

Gather and prepare evidence

Position within the organisation structure, job description of work role, working practices, health and safety, daily work routine, diary of work activities, report from work experience provider

Present information

Written or oral report on the work experience, name of work experience provider, nature of the organisation (type of business, products or services), job role, health and safety, skills and knowledge developed

Unit 201 Undertake Work Related Experience in the Land-based Industries

Notes for guidance

Learners on centre-based courses should have experience of the type of work that they hope to do and of the expectations of potential future employers. Some level 2 learners are likely to already have experience of working in the land-based and environmental industries, so this unit seeks to provide new experience opportunities for these learners.

This unit should be undertaken in a real business environment relevant to the subject interest of the learner but work experience may be gained by a number of routes, e.g. as part of an industrial placement whilst within the programme, whilst working on a planned daily or weekly basis on the centre's commercial and/or educational facilities, whilst undertaking voluntary work within the industry, or as a member of a group of learners invited to carry out practical work on a suitable business.

Any Act or legislation that is sector specific should be adhered to. This includes duty of care if working with animals.

Learners should complete the equivalent of 4 weeks (or 150 hours) work experience to achieve this unit. Centres should be mindful of their responsibilities for ensuring that work placements have appropriate supervision, insurance and health and safety policies in place and that learners have access to appropriate support whilst on placement.

In Outcome 1, learners will explore the different job roles, responsibilities and job titles commonly associated with them in their specialist sector. This background understanding is likely to require some classroom teaching but learners should be encouraged to explore the range of employment opportunities within their specialist sector. It would be appropriate for employers to be invited to outline to learners their expectations in the workplace. Learners will be required to consider the skills and qualifications that are required for appropriate jobs, and should be encouraged to think about the skills and qualifications that they may need to acquire to achieve their employment ambitions. This should also help them to identify a suitable work experience placement.

Outcome 2 involves learners undertaking the process of applying for work experience. They will need to locate suitable job adverts but can be supported by centres suggesting suitable placements. When applying for work experience learners should produce, as a minimum, a detailed curriculum vitae and letter of application using a computer. Learners may need to be given supported workshop time on computers to develop these documents. Before attending a work experience interview, it would be appropriate for learners to role play an interview and be given feedback on their interview technique. After attending an interview, they should reflect on their performance and how they could improve their effectiveness.

In Outcome 3, learners will review their existing skills, knowledge and experience against those required for a specific job role and how they will seek to develop these during the work experience. This development will be reviewed at a mid-point during the work experience and at the end, when they will reflect on how the work experience has helped to develop their future employability in line with their employment ambitions. Whilst learners are on work experience, and especially if this is an extended placement away from the centre, it is important that they have access to and support available from tutors.

Unit 201 Undertake Work Related Experience in the Land-based Industries

Outcome 4 requires learners to gather basic evidence on their work experience, including the organisation name, main products or services, organisation staffing structure and their role within

the organisation. The learner does not need to keep a diary of all duties undertaken each day but should produce a detailed description of the usual work routine and supplement this with a diary of any additional tasks, events, activities or items that represent learning opportunities. They should also note how health and safety of staff and, if relevant, customers is managed in the workplace. A feedback report from the work experience provider will form part of the evidence for this outcome. The final report on work experience could be presented in written form or as a presentation to tutors and other learners. As a minimum, it should include the range listed. It would be appropriate to include the final review and reflection on work experience from Outcome 3 in this report.

Unit 202 Environmental and Land-based Business

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of business within the environmental and land-based sector, and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or to further education and training.

The learner will investigate the structure of one industry within the land-based sector and the principal organisations within it. They will explore regulations and legislation relevant to that industry. The learner will develop the knowledge of common business operations and the simple administrative tasks.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Know an industry within the environmental and land-based sector
2. Know the relevant legislation and codes of practice within the environmental and land-based sector
3. Know common business operations
4. Know how to carry out simple administrative tasks

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

n/a

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge

Unit 202 Environmental and Land-based Business

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

Assessment Criteria

The learner can:

1. Describe the **structure** of one industry within the environmental and land-based sector covering:
    - size
    - employment
    - main activities
    - geographical influence
    - economic contribution
2. Identify the **principal organisations and trade associations** within an industry in the environmental and land-based sector.

Unit content

Structure

Features and characteristics of the industry, different types of businesses and organisations and the type of goods and services they provide, size of these businesses/organisations e.g. numbers employed, regional differences, allied industries (what they are, the goods and services they supply and the role they play), trends and issues currently affecting the industry

Principal organisations and trade associations

Roles and aims of key selected organisations in the industry e.g. statutory, Department for Environment, Food and Rural Affairs ((Defra) England), Welsh Assembly Government (Wales), Scottish Executive Environment and Rural Affairs Department (SEERAD), or Department of Agriculture and Rural Affairs (DARD (Northern Ireland), Health and Safety Executive, Department of Trade and Industry (DTI), Environment Agency, Food Standards Agency, non-governmental, major land-owning or representative e.g. The Royal Society for the Prevention of Cruelty to Animals (RSPCA), British Veterinary Association (BVA), Royal Horticultural Society (RHS), Institute of Groundsmanship (IOG), Lantra Sector Skills Council, British Horse Society (BHS), National Farmers Union (NFU), National Trust, Natural England

Unit 202 Environmental and Land-based Business

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

Assessment Criteria

The learner can:

1. Identify the main United Kingdom or European **legislation and codes of practice** relating to one industry within the environmental and land-based sector
2. Identify key requirements of current **employment law** on the environmental and land-based sector

Unit content

Legislation and codes of practice

United Kingdom legislation: consideration of the main relevant current legislation relating to an industry in the land and environment sector for example Agriculture Tenancies Act (1995), Animal Health Act (2002), Welfare of Animal (Transport) Order 2006, Animal Welfare Act 2006, Environment Protection Act 1990 (as amended 1995), Control of Pesticides Regulations 1986 (COPR), Riding Establishments Act 1970, Horse Passports (England) Regulations 2004, Control of Dogs Order 1992, Dangerous Dogs Act 1991(as amended 1997), codes of practice e.g. welfare of farm or companion animals

European legislation: relevant European directives e.g. relating to employment, the environment and the specific industry in the land and environment sector

Employment law

The main relevant current legislation relating to employment e.g. Health and Safety at Work etc Act 1974, Control of Substances Hazardous to Health Regulations (2002) (COSHH), Working Time Regulations 1998 (as amended 2002), Disability Discrimination Acts 1995 (as amended 2005), Employment Act 2002, National Minimum Wage Act 1998, Race Relations Act 1976 (as amended 2003), Sex Discrimination Act 1975

Unit 202 Environmental and Land-based Business

Outcome 3 Know common business operations

Assessment Criteria

The learner can:

1. Describe how **common IT software** can be used in everyday business operations
2. State the purpose and operation of **common business tasks**
    - financial and banking
    - marketing
    - administrative tasks

Unit content

Common IT software

Examples of business uses of: word processor (e.g. letters, notices), spreadsheets (e.g. records, timesheets), database (e.g. records), graphics (e.g. advertisements, posters), e-mails

Common business tasks

Financial and banking: taking payments by cash, cheque, debit card and credit card, ordering procedure for supplies, invoices, types of bank account (current, savings), loans, overdraft, methods of payment (debit card, cheques, bank giro credit, standing order, direct debit)
Marketing: ways to promote a business (advertisements, promotional events, referral / word of mouth, importance of customer care), preparation of promotional materials
Administrative tasks: file documents, complete simple records (e.g. production, customers), check stock levels and complete stock control records, communicate using written and electronic media, importance of security and confidentiality of business records

Unit 202 Environmental and Land-based Business

Outcome 4 Know how to carry out simple administrative tasks

Assessment Criteria

The learner can:

1. Use appropriate methods to **prepare, present, sort and retrieve information**
2. Carry out simple **accounting and administrative tasks** appropriate to the business

Unit content

Prepare, present, sort and retrieve information

Use of IT and paper filing systems, completion of simple business records, preparation of business documents (e.g. letters, advertisements)

Accounting and administrative tasks

Completion of orders, invoices, cheques, conduct stock check and complete stock records

Unit 202 Environmental and Land-based Business

Notes for guidance

This unit can be applied to any of the industries in the environmental and land-based sector, and delivery should be specifically tailored to the vocational interests of learners and the qualification being studied. They will learn about the industry and legal context in which businesses in the chosen sector takes place, and important operations necessary to manage a business.

In Outcome 1, learners will study the structure of their industry. They may be encouraged to represent graphically the range of businesses and their products/services, and also the ancillary businesses on which the primary businesses depend. They could relate these ideas to a specific business, whilst also investigating the range of businesses found locally and nationally. Learners will also find out about the principal organisations and trade associations concerned with their industry, and will investigate the roles and impact of selected organisations. They will investigate some of the key trends and issues facing their industry and how it is responding. Delivery of this outcome would be enriched by speakers from selected organisations.

Outcome 2 examines the UK and European legal framework affecting businesses in the particular land-based industry. Learners are not expected to become legal experts, but to develop an awareness of the main pieces of legislation and how they impact on business in their industry. Delivery of this outcome could be enhanced by guest speakers with experience of running a business or becoming self employed for the first time.

In Outcome 3, learners will identify how common IT software can be used to perform a range of everyday business operations. Some of these are common to all businesses (e.g. writing letters), but tutors should ensure that examples are vocationally relevant to the subject area of the learners. It would be helpful for learners to have the opportunity to practice some of the IT skills to carry out simulated business tasks. Learners should find out about day-to-day business activities involving finance and banking, but will not be expected to learn about accounts. It would help learners to have the opportunity to study a range of records (financial and non-financial) that are kept in a specific business, and how these are maintained and used.

Outcome 4 links closely with Outcome 3 and gives learners the opportunity to understand and engage in operations and tasks identified previously. This should include preparing a range of business outputs using the IT applications listed. These could relate to other items in the content, e.g. advertisements, posters, specific records appropriate to businesses in their industry. They will also complete examples of paper based records and ensure that both IT and paper records are filed appropriately.

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www.dardni.gov.uk	Department of Agriculture and Rural Affairs (Northern Ireland) www.bized.ac.uk Business Education Websites
www.hse.gov.uk	*Health and Safety Executive*
www.dti.gov.uk	*Department for Trade and Industry*
www.environment-agency.gov.uk	*Environment Agency*
www.food.gov.uk	*Food Standards Agency*
www.rspca.org.uk	*Royal Society for the Prevention of Cruelty to Animals*
www.bva.co.uk	*British Veterinary Association*
www.rhs.org.uk	*Royal Horticultural Society*
www.iog.org.uk	*Institute of Groundsmanship*
www.lantra.co.uk	*Lantra Sector Skills Council*
www.bhs.org.uk	*British Horse Society*
www.nfuonline.com	*National Farmers Union*
www.nationaltrust.org.uk	*The National Trust*
www.naturalengland.org.uk	*Natural England*

Unit 203 Introduction to Crop Establishment

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of crop establishment 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.

The learner will develop their knowledge of crop physiology, ground conditions and preparation, crop planting and feeding. They will carry out practical soil investigation, cultivation and crop establishment.

Learning outcomes

There are **five** learning outcomes to this unit. The learner will:

1. Know the physiology of crops
2. Be able to investigate soil
3. Be able to prepare and cultivate land for planting
4. Understand the importance of crop nutrients
5. Be able to establish crops

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

AgC4 Prepare and Cultivate Sites for Planting Extensive Crops

AgC5 Prepare for Planting and Plant Extensive Crops

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge

Unit 203 Introduction to Crop Establishment

Outcome 1 Know the physiology of crops

Assessment Criteria

The learner can:

1. Describe the **structure** of monocotyledons and dicotyledons
2. Describe the process of **plant growth** to maturity including:
    - photosynthesis
    - respiration
    - nutrient and water take up
    - translocation
    - transpiration

Unit content

Structure

Stems, roots, buds, nodes, leaves, flowers- examples of both monocotyledons and dicotyledons

Plant growth

Photosynthesis: outline process, required factors, chlorophyll, water, light, carbon dioxide

Respiration: outline process of aerobic respiration, nutrients, oxygen, ATP

Translocation and transpiration: outline processes

Process and stages of germination, stages of growth, growth of roots and shoots

Unit 203 Introduction to Crop Establishment

Outcome 2 Be able to investigate soil

Assessment Criteria

The learner can:

1. Collect and classify **soil samples**
2. State the importance of **types of soil** for a range of production crops
3. Explain how the **conditions (weather, soil)** affect planting

Unit content

Soil samples

Properties to cover soil structure, soil water, air space, soil organic matter, pH

Types of soil

Sand, clays, loams and silts

Conditions (weather, soil)

Rainfall, runoff, drainage, soil moisture content, soil temperature, damage to soil, effects on crop establishment

Unit 203 Introduction to Crop Establishment

Outcome 3 Be able to prepare and cultivate land for planting

Assessment Criteria

The learner can:

1. **Prepare for and cultivate** the land for planting
2. State the **types of problems** which may occur during planting and who these should be reported to
3. Describe the importance of checking the **quantity and quality of plant material** required for planting

Unit content

Prepare for and cultivate

Cultivation equipment: ploughs, harrows, cultivators to include powered and un-powered equipment

Sequencing of cultivator use to establish tilth required, suitable depth for material being planted

Infield driving techniques, turns and use of headlands

Types of problems

Equipment breakdown and failure, incorrect set up for plant material, inappropriate soil and/or weather conditions

Quantity and quality of plant material

Quantity: relating to quantity required. Area estimation and seed/plant density and/or rates per hectare

Quality: seed/plant treatments, seed viability, seed/plant condition

Unit 203 Introduction to Crop Establishment

Outcome 4 Understand the importance of crop nutrients

Assessment Criteria

The learner can:

1. Discuss the use of **major and minor plant foods** in plant growth
2. Explain methods of **maintaining nutrients** in crops

Unit content

Major and minor plant foods

Major: nitrogen, potassium, phosphates and their influences on plant growth

Minor: to include copper, manganese, iron

Maintaining nutrients

Application: precision and broadcast, pre and post planting, timing of application, use of organic or inorganic fertiliser

Unit 203 Introduction to Crop Establishment

Outcome 5 Be able to establish crops

Assessment Criteria

The learner can:

1. **Plant Crops** in accordance with Instructions
2. **Select, prepare, maintain** and store **equipment** in a safe and effective working condition

Range

Equipment

combine drills, pneumatic drills, precision drills, broadcasters

Unit content

Plant crops

Using seed, setting and calibration of equipment, in field driving techniques (safety, speed)

Reasons for selection

Soil type, soil fertility, cropping area, timing, available tractor power

Prepare

Pre use checks and set up using manufacturer's instructions

Maintain equipment

Cleaning, greasing, rust prevention

Unit 203 Introduction to Crop Establishment

Notes for guidance

This unit is designed to provide the learner with sound knowledge and skills required to establish crops including soil preparation, planting and nutrient application. Throughout the unit the emphasis is on safe working practice. The unit enables the learner to link successful plant growth with the external factors that influence plant behaviour including soil conditions, good establishment, nutrient availability, weather and location.

Outcome 1 enables the learner to understand seed structure and the requirements for plant growth. Much of this will be classroom based delivery including scientific principles. It is important that this is related to practical field requirements for successful crop establishment. The learner to be able should recognise plant growth problems and be able to prevent future problems from arising.

Outcome 2 covers soil types and condition. Much of this delivery can be practical based, taking and examining soil samples for classification. The use of soil profile pits is advised. Classroom sessions should examine topological features and weather effects and this can be enhanced with site visits.

Outcome 3 enables the learner to select and use a range of cultivation equipment to prepare soil for planting. The emphasis here should be on practical in field use of equipment. Techniques to prepare land for cultivation are reviewed. These include removing vegetation including previous crop, weeds and debris. The learner needs to be able to relate the requirements of the crop to be established with the tilth and depth of cultivation required. Equipment selection should also be related to soil type.

Outcome 4 gives the learner knowledge and an understanding of the nutrient, both major and minor, needed for successful plant growth. The learner should understand the interaction of these nutrients and what each major nutrient supports in terms of plant growth. The effect of minor nutrients on major nutrient take up should be referred to. The learner should be able to identify symptoms of nutrient deficiency. The learner should be able to describe methods of applying nutrients in both liquid and solid form.

Outcome 5 allows the learner to use suitable equipment to plant crops in accordance with instructions. Equipment should be prepared, maintained and stored in accordance with the manufacturer's instructions. It is important that delivery is practical based and as much experience as possible gained in a field situation. This provides an opportunity to apply and embed knowledge gained in outcomes 1 to 4. It is particularly important that safe working practices and the use of PPE are emphasised in the delivery of this outcome.

Centres should take every opportunity to deliver this in an applied manner, using real working environments and linking classroom based sessions with outdoor exercises, including investigations demonstrations and practicals. Health and safety and the use of manufacturer's manuals should be emphasised throughout.

References

Books

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www.dardni.gov.uk	Department of Agriculture and Rural Affairs (Northern Ireland)
www.hse.gov.uk	Health and Safety Executive
www.saps.plantsci.cam.ac.uk	The Science and Plants for Schools Website

Unit 204 Introduction to Farm Animal Production

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of farm animal production 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.

This unit examines common livestock production systems and gives learners an opportunity to develop the skills and knowledge needed to work with specified farm livestock

Learning outcomes

There are **three** learning outcomes to this unit. The learner will:

1. Know the common production systems used in livestock farming
2. Know the principles of livestock enterprise management
3. Be able to carry out routine husbandry and animal health duties on common farm livestock

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

This unit is linked to parts of a number of the NOS in Livestock Production

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge

Unit 204 Introduction to Farm Animal Production

Outcome 1 Know the common production systems used in livestock farming

Assessment Criteria

The learner can:

1. Describe the **production cycles for common livestock enterprises**
2. State the **products of commonly farmed livestock**

Unit content

Production cycles for common livestock enterprises

Dairy Production: calf rearing, rearing of replacement heifers, lactation cycle

Beef Production: suckler cows, intensive and extensive beef systems

Sheep Production: early, spring and late lambing, the shepherd's year

Pig Production: indoor and outdoor production, timings of production cycle

Poultry Production: production cycle for commercial egg laying birds, broilers, ducks, geese and turkey, slaughter weights and ages

Products of commonly farmed livestock

Types of product: live animals at various stages in the life cycle, eggs, meat, milk, fleece

Unit 204 Introduction to Farm Animal Production

Outcome 2 Know the principles of livestock enterprise management

Assessment Criteria

The learner can:

1. Describe the **breeding and reproduction of common farm livestock**
2. Describe the **husbandry and management of common farm livestock**

Range

Common farm livestock: two from cattle (dairy, beef), pigs, sheep, poultry

Unit content

Breeding and reproduction of common farm livestock

Selection of breeding stock, signs of oestrus, service management, length of gestation, care of animal after mating and during gestation, parturition, care of new offspring and female after birth

Husbandry and management of common farm livestock

Feeding principles and practices, housing requirements, routine health treatments and stock tasks

Unit 204 Introduction to Farm Animal Production

Outcome 3 Be able to carry out routine husbandry and animal health duties on common farm livestock

Assessment Criteria

The learner can:

1. Carry out **routine husbandry duties** on common farm livestock
2. Carry out **health checks** on common farm livestock
3. Carry out **routine treatments to maintain health and wellbeing** of common farm livestock

Range

Common farm livestock: two from cattle (dairy, beef), pigs, sheep, poultry

Unit content

Routine husbandry duties

Feeding, cleaning, moving and monitoring animals, counting, record keeping

Health checks

Assess physical condition and behaviour of livestock, signs of health and ill health in different farm livestock (temperature and respiration, alertness, posture, movement, coat/feather condition, feeding, faeces condition)

Routine treatments to maintain health and wellbeing

Routine stock tasks, for example handling, haltering, disbudding, castration, dosing, injecting, temperature taking, feet trimming, ear marking, weighing, selection for slaughter

Unit 204 Introduction to Farm Animal Production

Notes for guidance

This unit investigates the husbandry and livestock production techniques involved in modern farming systems, and enables learners to develop some practical husbandry skills. Learners will concentrate on the livestock species traditionally farmed in the UK.

As learners will be engaged in visits and practical activity there should be an emphasis on safe working practices, including the use of appropriate personal protective equipment (PPE), and appropriate risk assessments should be undertaken.

For Outcome 1, learners will need to gain an overview of the production cycle for the major types of farm animal. For animals kept for breeding this cycle will need to include the stages from one parturition to the next. For animals kept for meat or other products this should include the stages from birth to slaughter/sale**.** This outcome also covers knowledge of the products of those livestock species commonly farmed in the UK. It is anticipated that any classroom delivery will be supplemented by trips and visits to enable learners to see animals at different stages of their production cycle. Guest speaker input, for example from a livestock producer, would also help learners to put each stage of the production cycle in context.

The focus of Outcome 2 is the breeding, reproduction, management and husbandry of livestock, where learners need to gain an understanding of techniques and good practice. It is anticipated that learners will gain an overview of husbandry themes common to all livestock, and explore the requirements of two categories of farm livestock in more detail. It will be helpful for learners to visit a range of livestock units and take part in a range of care and husbandry tasks, which could be linked to delivery of outcome 3.

It is anticipated that delivery of Outcome 3 will be largely though the development of practical husbandry skills. It is essential that learners have access to farm animals so that they can learn and practice their stock skills, and take part in routine care through farm duties. Farm practical's should be designed in group sizes that allow demonstration and consolidation by practice to allow skill development. Sufficient animals need to be available so that stock tasks can be practised until a working level of confidence is reached, and to minimise stress on livestock.

It is important that teachers stress the requirements for health and safety, animal welfare, and the importance of timeliness and hygiene. This outcome could also be developed in conjunction with learners' work experience at an appropriate placement.

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www.scotland.gov.uk	Scottish Executive Environment and Rural Affairs Department
www.dardni.gov.uk	Department of Agriculture and Rural Affairs (Northern Ireland)
www.eblex.org.uk	English Beef and Lamb Executive
www.fawc.org.uk	Farm Animal Welfare Council
www.hse.gov.uk	Health and Safety Executive
www.bpex.org.uk	British Pig Executive
www.npa.org.uk	National Pig Association

Unit 205 Introduction to Land-Based Machinery Operations

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of land-based machinery operations 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.

The learner will be able to develop the skills and knowledge to select, prepare, operate, and maintain a range of land- based equipment and machines appropriate to their area of study. The learner will also cover the health and safety requirements associated with the use and maintenance of machines.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Understand safe working principles when using equipment and machinery
2. Be able to prepare land-based equipment and machinery for use
3. Be able to operate land-based equipment and machinery
4. Be able to maintain land-based equipment and machinery

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

CU27 Maintain equipment and machines

L27 Use and maintain non-powered and hand held powered tools and equipment.

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge

Unit 205 Introduction to Land-based Machinery Operations

Outcome 1 Understand safe working principles when using equipment and machinery

Assessment Criteria

The learner can:

1. Select **appropriate equipment** for land-based tasks
2. Explain why **manufacturers' instructions** should be followed when working with land-based equipment and machines
3. Explain the **legal and environmental requirements** associated with specific machines
4. Identify the **controls/devices/instruments** and other health and safety requirements for machinery and equipment

Range

Agriculture

As appropriate from:
Types: powered and powered machines, tractor mounted, trailed or self propelled, seeding/ planting equipment
Purposes: seedbed preparation, crop harvesting, materials application, liquids, solids, granules, powders

Horticulture/Landscape

As appropriate from:
Types: non powered tools and equipment, hand held power tools, pedestrian controlled machines, ride on machines
Purposes: ground preparation, grass cutting and collection, materials application, liquids, granules, powders, pelleting, chipping, shredding

Unit content

Appropriate equipment

As outlined above, selection, fit for purpose, ground conditions, suitability for scale of work, training/certification requirements

Manufacturers' instruction

Dealer installation process, operator instruction manuals, manufacturer web sites

Legal and environmental requirements

Health and Safety at Work etc Act 1974 (HASWA), Provision and Use of Work Equipment Regulations 1998 (PUWER), Lifting Operations and Lifting Equipment Regulations 1998 (LOLER Control of Substances Hazardous to Health Regulations (2002) (COSHH),
Control of Pesticides Regulations 1986 (COPR), Environmental contamination, Personal Protective equipment (PPE)

Controls/devices/instruments

Operator controls, power unit controls, manual, hydraulic, electronic, machine adjustment/performance settings - safe start devices, clutches, performance/load limiters, seat

Unit 205 Introduction to Land-Based Machinery Operations

occupation switches, guards – warning lights, analogue/digital information

Unit 205 Introduction to Land-Based Machinery Operations

Outcome 2 Be able to prepare land-based equipment and machinery for use

Assessment Criteria

The learner can:

1. Carry out **adjustments** on land-based equipment and machines to meet specific requirements prior to use
2. Explain the **benefits** of correct adjustment of equipment and machines
3. Carry out **pre-start checks,** including **fuelling**

Range

Agriculture
As appropriate from:
Types: powered and powered machines, tractor mounted, trailed or self propelled, seeding/ planting equipment
Purposes: seedbed preparation, crop harvesting, materials application, liquids, solids, granules, powders

Horticulture/Landscape
As appropriate from:
Types: non powered tools and equipment, hand held power tools, pedestrian controlled machines, ride on machines
Purposes: ground preparation, grass cutting and collection, materials application, liquids, granules, powders, pelleting, chipping, shredding

Unit content

Adjustments
Operator fit, working height/depth/speed/calibration/tilth/work rate

Benefits
Specific work rates/outputs achieved, power/fuel consumption, risk of premature wear/damage to equipment, operator fatigue

Pre-start checks
Lubricants, cooling, fuel level, wheel equipment, safety guards, road legal, machine/vehicle security, PPE

Fuelling
Fuel types, fuel contamination checks, correct storage, machine power isolation, ventilation, spillage, safe areas, fire hazards, PPE

Unit 205 Introduction to Land-Based Machinery Operations

Outcome 3 Be able to operate land-based equipment and machinery

Assessment Criteria

The learner can:

1. **Operate** equipment and machines safely and **efficiently** for different land-based activities
2. Carry out activities to achieve the **desired results** when operating land-based equipment and machines

Range

Agriculture
As appropriate from:
Types: powered and powered machines, tractor mounted, trailed or self propelled, seeding/ planting equipment
Purposes: seedbed preparation, crop harvesting, materials application, liquids, solids, granules, powders

Horticulture/Landscape
As appropriate from:
Types: non powered tools and equipment, hand held power tools, pedestrian controlled machines, ride on machines
Purposes: ground preparation, grass cutting and collection, materials application, liquids, granules, powders, pelleting, chipping, shredding

Unit content

Operate
Attachment to power unit, engagement of power, assess test runs and re-adjust, site assessment for hazards/risks, continuous monitoring of performance, over/under lapping

Efficiency
Acceptable work rates, back up power availability, economy of fuel, wearing component lifespan

Desired results
All area covered, correct application rates/tilth of seedbed, quality of cut, avoid undesirable results (compaction of soil, wheel marks in seedbed)

Unit 205 Introduction to Land-Based Machinery Operations

Outcome 4 Be able to maintain land-based equipment and machinery

Assessment Criteria

The learner can:

1. Identify **routine maintenance** for land-based equipment and machines using manufacturers' instructions
2. Identify **hazards** and comply with risk assessments **during maintenance activities**
3. Carry out different **routine maintenance activities** safely on a range of equipment and machines
4. **Record maintenance activities** in an **appropriate format**

Range

Agriculture

As appropriate from:

Types: powered and powered machines, tractor mounted, trailed or self propelled, seeding/ planting equipment

Purposes: seedbed preparation, crop harvesting, materials application, liquids, solids, granules, powders

Horticulture/Landscape

As appropriate from:

Types: non powered tools and equipment, hand held power tools, pedestrian controlled machines, ride on machines

Purposes: ground preparation, grass cutting and collection, materials application, liquids, granules, powders, pelleting, chipping, shredding

Unit content

Routine maintenance

Pre-work assessment of machine condition, routine/periodic maintenance, adjustments for wear, lubrication, replacement components, preparation for storage, cleaning, lubrication and protection

Hazards during maintenance activities

Identify hazards according to operations

Record maintenance activities

Complete maintenance record sheet/job cards, record service/maintenance interval/date/work done, record replacement of wearing components, working life

Appropriate format

Manufacturers documentation, service record book, service record charts, company procedures, electronic record storage, service interval label on machine

Unit 205 Introduction to Land-based Machinery Operations

Notes for guidance

This unit is designed for learners who will be given responsibility for field/groundwork using machines typical to their area of study. The unit will provide learners with knowledge and understanding, operational skills and service procedures to prepare, use, maintain and store machines and equipment. Throughout the unit the emphasis will be on acceptable health and safety procedures and safe working practices. It is expected that where tractor mounted machines are to be utilised, prior learning on tractor operations will have been assessed to ensure the learner has reached an acceptable level of skills and knowledge.

The range covered during delivery should include electric vehicles and machinery.

Health and safety - Centres and tutors aware of the need to safeguard learners, particularly in relation to pre-16 learners, when delivering and assessing units where the operation of machinery is involved. This unit requires the learner to undertake machinery operations under close supervision, and this is the same for any unit within the qualification that requires the learner to operate or use machinery. This is a largely practical-based unit which looks at the basic preparation, operation and maintenance of equipment and machinery. There is significant emphasis on safe practices throughout the unit and reference to risk assessment in learning outcome 4. Throughout the unit
the emphasis is on acceptable health and safety procedures and safe working practices. The guidance in this unit requires that Health and Safety must be strictly enforced and repeated throughout. The HSE guidance AS10 'Preventing Accidents to Children on Farms' provides practical guidance on how to reduce the risk of injury to children under 13 and older children below the minimum school leaving age (usually 16).

In Outcome 1 the learner will be able to select a suitable item of equipment to perform a range of land-based tasks to achieve given outcomes. The learner will be able to understand basic working principles of the equipment and any environmental and legal issues relating to the machines' use. Manufacturers' instructions are to be followed at all times to interpret operator controls and instrumentation information.

In Outcome 2 the learner is expected to demonstrate skills in the use of machines and equipment used in the area of their study. This may entail operator set up, connection to power source and initial setting prior to moving on site. Where tractor trailed, mounted or self propelled equipment is to be used an understanding of safe fuelling and transportation must be demonstrated. With ever-increasing costs on fuel, wearing components and operator time, an understanding of the benefits of correct operating procedures, setting linked to work rate targets must be understood.

In Outcome 3 the learner needs to be aware of a range of machine capabilities to achieve specified performance criteria. These may be work rate targets, quality of work, height/depth of work or delivery rates. Field/site procedures need to be correctly chosen where subsequent operations are to follow. Seeding requires a specific depth of seedbed, a fineness of tilth to suit seed type, minimum seedbed compaction with no wheel marks evident.

In Outcome 4 the learner must be able to identify from the manufacturers' instructions, and demonstrate maintenance requirements and procedures. Where power sources are used, maintenance of those sources will need to be identified. Risks of injury/damage to self, others, the

environment or equipment need to be identified by the learner and control measures put in place prior to commencement of any maintenance tasks. To enable evaluations and costings to be done

an accurate record of work, maintenance and replacement parts must be recorded. This may also be of benefit where warranty procedures are to be implemented to recoup costs of breakdowns.

References

Books

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Culpin C. 1992. *Farm Machinery, 12th edition.* Blackwell Scientific. ISBN: 0-632-03159-X.

Journals

Horticultural Weekly
Profi International
Manufacturers publications and manuals
Lubrication charts and data sheets

Websites

www.bagma.com	British Agricultural and Garden Machinery Association
www.defra.gov.uk	Dept for Environment, Food and Rural Affairs
www.wales.gov.uk	Welsh Assembly Government
www.scotland.gov.uk	Scottish Executive Environment and Rural Affairs Department
www.dardni.gov.uk	Department of Agriculture and Rural Affairs (Northern Ireland)
www.hse.gov.uk	Health and Safety Executive

Unit 206 Introduction to the Principles of Land-based Machinery

Level: 2

Credit value: 5

Unit aim

This unit aims to provide learners with an understanding of the principles of land-based machinery 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.

The learner will be able to recognise the basic roles and functions of engines as the major power source for Land-based machines. It covers knowledge and skills including the working principles of engines and typical engine maintenance activities that may be carried out by the operator.

Learning outcomes

There are **three** learning outcomes to this unit. The learner will:

1. Know the working principles of combustion engines
2. Know the maintenance requirements of machines
3. Be able to maintain engines on land-based machines

Guided learning hours

It is recommended that **30** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

CU27 Maintain equipment and machines

L27.1 Use and maintenance of non-powered and hand held power tools and equipment

L27.2 Carry out routine maintenance to equipment and machinery

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SCC.

Assessment and grading

This unit will be assessed by:

- An assignment covering assessed practical competencies and underpinning knowledge

Unit 206 Introduction to the Principles of Land-based Machinery

Outcome 1 Know the working principles of combustion engines

Assessment Criteria

The learner can:

1. Describe the uses of **combustion engines** on a range of machines within a land-based industry
2. Describe the **working cycles of 2 stroke and 4 stroke engines**
3. State the **functions of component parts** of a combustion engine
4. Describe methods of **transmitting drive** from engines to the working parts of machines

Unit content

Combustion engines

Compression Ignition (CI), Spark Ignition (SI)

Working cycles of 2 stroke and 4 stroke engines

Otto cycle, 2 stroke cycle, air induction, exhaust emissions

Function of component parts

Crankshaft, pistons, connecting rods and bearings, piston rings, bore types, camshaft, valves and springs, oil pump, flywheel

Transmitting drive

Friction plate clutches centrifugal clutches, hydraulic clutches, belt and pulleys, chain and sprocket, gears, electrical generator, compressed air, hydraulics

Unit 206 Introduction to the Principles of Land-based Machinery

Outcome 2 Know the maintenance requirements of machines

Assessment Criteria

The learner can:

1. Describe **common hazards** associated with machine use and maintenance
2. State the purpose of common **workshop tools**

Range

All Learners: activities in maintenance workshop and on site, periodic maintenance, preventative maintenance, unscheduled maintenance

Unit content

Common hazards

Machine power isolation, machine stability and contamination from fuels/lubricants/chemicals/sharps/heat/pressure/fumes

Workshop tools

Spanners/sockets and wrenches, torque wrenches and multipliers, screwdrivers, hammers, punches, service gauges and measuring equipment, tool kit and on site tool kit

Unit 206 Introduction to the Principles of Land-based Machinery

Outcome 3 Be able to maintain engines on land-based machines

Assessment Criteria

The learner can:

1. Carry out a **risk assessment** for machine **maintenance activities**
2. Carry out **pre-start checks and starting procedures** on machines

Unit content

Risk assessment

Risks to self, risks to others, risk to environment, risk to machines and equipment

Pre-start checks and starting procedures

Fuel level, oil levels, coolant and cooling, safety guards and panels, fume extraction within buildings, safe operation distances, safety start devices, engine/turbocharger oil pressure

Maintenance activities

Machine preparation prior to routine/scheduled maintenance, unscheduled maintenance on site, safe use of tools, selection of correct replacement service components, preparation of service area, re-instatement of service area, post service inspection of machine

Also, need to cover:

Current Legislation

Health and Safety at Work etc Act1974 (HASWA), Provision and Use of Work Equipment Regulations 1998 (PUWER), Lifting Operations and Lifting Equipment Regulations 1998 (LOLER)

Maintenance records

Maintenance check lists, job cards, inspection reports, recording machine details and work hours, records of repairs/replacement parts

Unit 206 Introduction to the Principles of Land-based Machinery

Notes for guidance

This unit is designed to provide learners with knowledge and understanding of basic working principles of Land-based powered equipment, requirements for regular service, maintenance and repair and safe practical experiences while undertaking maintenance tasks.

The range covered during delivery should include electric vehicles and machinery.

Health and safety - Centres and tutors need to be aware of the need to safeguard learners, particularly in relation to pre-16 learners, when delivering and assessing units where the operation of machinery is involved. This unit requires the learner to undertake machinery operations under close supervision, and this is the same for any unit within the qualification that requires the learner to operate or use machinery. This is a largely theory based unit, but Outcome 3 requires learners to be able to maintain engines on land-based machines. Throughout the unit the emphasis is on acceptable health and safety procedures and safe working practices. The guidance in this unit requires that Health and Safety must be strictly enforced and repeated throughout. The HSE guidance AS10 'Preventing Accidents to Children on Farms' provides practical guidance on how to reduce the risk of injury to children under 13 and older children below the minimum school leaving age (usually 16).

In Outcome 1 the learner will be required to investigate working principles of the range of engine types that power land-based vehicles and machines. It is essential that the learner understands the limitations of engine types and why manufacturers designate their use to different purpose. The learners should be encouraged to develop understanding of topical issues regarding available fuel types, environmental pollution and running costs.

Outcome 2 prepares the learner for the knowledge and understanding required prior to undertaking practical maintenance work on engines and powered machines. Emphasis should be directed to safe working practices, care of machines, tools and work areas. The learner should also be encouraged to plan for unscheduled maintenance tasks. Due to the complexity of land-based vehicles and machines it is essential that learners understand that maintenance of machines and vehicles must be carried out to manufacturers recommendations and that service documentation should be available and accurately followed when performing tasks.

In Outcome 3 the learner will be required to carry out risk assessments and put appropriate control measures in place before completing the practical activities. It is anticipated that delivery of this outcome will be predominantly practical, with learners gaining experience of carrying out pre-start checks. The learner must be aware of current legislation and safe working practices and be encouraged to adopt a clean, tidy and methodical approach to work ethic. The importance of accurate completion of maintenance and work records must be highlighted.

Throughout the unit the emphasis will be on safe, legal practices, working to manufacturers' recommended procedures and attention to detail when recording information.

References

Books

Bell B. 2005. *Farm Machiner. 5th e.* Old Bond Publishing. ISBN: 1-903-36668-2.

Hillier V and Coombes P. 2004. *Hillier's Fundamentals of Motor Vehicle Technolog. 5th ed.* Nelson Thornes. ISBN: 0-748-78082-3.

Manufacturer's service charts, operator manuals

Websites

www.howstuffworks.com Discovery Communications

www.hse.gov.uk Health and Safety Executive

Unit 207 Introduction to Animal and Plant Husbandry

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of animal and plant husbandry 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.

The learner will understand the husbandry requirements of plants and animals used in land-based production. They will learn about the welfare of farm livestock and monitoring of livestock food, water and general health.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Understand the requirements needed to maintain the health and welfare of farm animals
2. Be able to provide food and water to production farm animals
3. Understand the annual production cycles of locally important crops
4. Know the requirements for maintaining the healthy growth of locally important crops

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

LP7.1 Prepare feed and water supplies for livestock

LP7.2 Monitor and maintain the supply of feed and water to livestock

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SCC

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge

Unit 207 Introduction to Animal and Plant Husbandry

Outcome 1 Understand the requirements needed to maintain the health and welfare of farm animals

Assessment Criteria

The learner can:

1. Explain **requirements needed to maintain the health and welfare** of a specified farmed mammal and a specified farmed bird
2. Assess the **health and welfare** of a specified farmed mammal or a specified farmed bird

Range

Farmed mammal: any from cattle, sheep, goat or pig

Farmed bird: any from chicken, duck, goose, turkey, pheasant

Unit content

Requirements needed to maintain the health and welfare

Food, water, housing, bedding, ventilation, space/ stocking ratios, preventative health treatments (worming, vaccination)

Health and welfare

Signs of health (appearance, temperature, respiration), animal behaviour, posture, movement, welfare in relation to the 'five animal needs', routine and non-routine health checks

Unit 207 Introduction to Animal and Plant Husbandry

Outcome 2 Be able to provide food and water to production farm animals

Assessment Criteria

The learner can:

1. Follow a **plan for providing food and water** to a given species of farmed animal
2. **Safely** carry out **routine feeding and watering tasks** for a given species of farm animal

Range

Farm animal: any from cow, sheep, goat or pig

Unit content

Plan for providing food and water

Purpose of a plan (growth/ maintenance/ milk production/ breeding), record keeping requirements, report to supervisor

Safely

Use of appropriate Personal Protective Equipment (PPE), completion of basic risk assessment, compliance with health and safety guidance and legislation

Routine feeding and watering tasks

Methods of feeding and providing water, feed types, select feeding equipment, prepare food for animals, feed animals, provide water to animals, monitor feeding and drinking of animals, clean feeding equipment, grazing management, seasonal factors

Unit 207 Introduction to Animal and Plant Husbandry

Outcome 3 Understand the annual production cycles of locally important crops

Assessment Criteria

The learner can:

1. Explain the **annual production cycles** of specified crops
2. State **factors that may change the growth and yield of a specified crop**

Range

Locally important crops

At least three production crops commonly grown in the local area

Unit content

Annual production cycles

Soil preparation, methods and timing of planting, growth patterns, harvest timing and methods, storage of crops

Factors that may change the growth and yield of a specified crop

Weather, soil type, structure and drainage, use and timing of fertilisers, weeds, pests and diseases, crop protection methods, previous cropping

Unit 207 Introduction to Animal and Plant Husbandry

Outcome 4 Know the requirements for maintaining the healthy growth of locally important crops

Assessment Criteria

The learner can:

1. Identify the **nutrient requirements** of a crop species at a given site
2. Describe the **common pests, weeds and diseases** of a crop species at a given site

Range

Locally important crops

At least three production crops commonly grown in the local area

Unit content

Nutrient requirements

Major and minor nutrient requirements (nitrogen, phosphorous, potassium, trace elements)

Common weeds

As appropriate to site, for example grass weeds (annual meadow grass, chickweed, Yorkshire fog, brome), broadleaved weeds (fat hen, couch, shepherds purse, brome, black grass, wild oats, cleavers, thistle, mayweed, black nightshade, field pansy, charlock, knotgrass, redshank)

Common pests

As appropriate to site, for example insects (aphids, beetles, leatherjackets, wireworm, black fly, pollen beetle), slugs, vermin (pigeons, starlings, rabbits, mice, rats)

Common diseases

As appropriate to site, for example cereal diseases (mildew, eyespot, septoria, gout-fly, yellow rust, phoma, chocolate spot, blight, canker)

Unit 207 Introduction to Animal and Plant Husbandry

Notes for guidance

This unit aims to provide learners with an understanding of the husbandry requirements of animals and plants used in agricultural production systems, and an opportunity to develop some livestock husbandry skills.

As learners will be engaged in practical activity there should be an emphasis on safe working practices, including the use of appropriate personal protective equipment (PPE), and appropriate risk assessments should be undertaken.

In Outcome 1 the focus is on the health and welfare of selected farmed animals and birds. There is a requirement for practical skill development in assessing the health and welfare of animals and birds, and in practical observation of animal and bird requirements, particularly of the "five animal needs". Learners should also have the opportunity to witness the implementation of preventative health measures, such as vaccination, worming and grassland management. In understanding the importance of health and welfare it is helpful to explore the consequences of poor health and welfare. As any visits or placements should be to those establishments showing due regard to animal health and welfare, consequences of poor health and welfare would be best covered through classroom based activity using library pictures and guest speakers.

In Outcome 2 it is anticipated that delivery will include consideration of the feeding and watering requirements for animals kept for different purposes and at different life and production stages. The unit has a practical focus, and learners need to carry out routine feeding and watering tasks in a working environment. It is important that tutors stress the requirements for health and safety, animal welfare, and the importance of timeliness and hygiene.

In Outcome 3 learners need to gain a holistic view of crop production from pre-planting activity to post harvest storage considerations. It is anticipated that delivery will include consideration of the time of year for different activities for both spring and winter sown crops. It is possible that learners will not be able to observe the full production cycle due to the timing of their college or school terms, and so visits will need to be supplemented with classroom based activity. This outcome also includes an understanding of the different factors which affect crop growth and yield, and classroom delivery would be usefully supplemented by practical activity such as site visits and crop walking.

In Outcome 4 learners will need to access a site where production crops are grown, as well as some formal input on the nature of nutrient requirements, pests, weeds and diseases. It will be helpful if, where possible, learners can see examples of common pests and weeds.

At level 2 it is likely that there will be differences in learners' prior experience, knowledge and confidence, and practical activity is likely to require a differentiated approach to ensure all learners progress appropriately. This unit enables learners to study production animals and crops that are of particular relevance to their local area. This maximises the opportunity for learning through visits, practical activity and work experience.

References

Books

Bateman H, Curtis S and McAdam K. 2006. *Dictionary of Agriculture*. A&C Black Publishers Ltd. ISBN: 0-713-67778-3.

Bazeley K. 2007. *Practical Cattle Farming*. The Crowood Press Ltd. ISBN: 1-861-26975-7.

Bland D. 1996. *Practical Poultry Keeping*. The Crowood Press Ltd. ISBN: 1-861-26010-5.

Cardell K. 1998. *Practical Sheep Keeping*. The Crowood Press Ltd. ISBN: 1-861-26163-2.

Lockhart J and Wiseman A. 2002. *Lockhart and Wiseman's Crop Husbandry*. Woodhead Publishing Ltd. ISBN: 1-855-73549-0.

Soffe RJ and McConnell P. 2003. *The Agricultural Notebook*. Wiley Blackwell.

ISBN: 0-632-05829-3.

Smith P. 2001. *Practical Pig Keeping*. The Crowood Press Ltd. ISBN: 1-861-26388-0.

Websites

www.defra.gov.uk	Department for Environment, Food and Rural Affairs
www.wales.gov.uk	Welsh Assembly Government
www.scotland.gov.uk	Scottish Executive Environment and Rural Affairs Department
www.dardni.gov.uk	Department of Agriculture and Rural Affairs (Northern Ireland)
www.fawc.org.uk	Farm Animal Welfare Council
www.iah.ac.uk	Institute for Animal Health
www.lantra.co.uk	Lantra (Sector Skills Council)
www.nfuonline.com	National Farmers' Union

Unit 208 Tractor Driving

Level: 2

Credit value: 5

Unit aim

This unit aims to provide learners with an understanding of the principles of tractor driving 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.

The aim of this unit is to provide learners with skills, knowledge and understanding to enable them to carry out tractor driving operations legally, safely and efficiently with the minimum of supervision.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Know the key components and operator controls on a tractor
2. Know the relevant legislation and codes of practice for tractor driving
3. Be able to carry out simple maintenance tasks and settings to a tractor
4. Be able to operate tractor and attachments

Guided learning hours

It is recommended that **30** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

CU11 Preparation and operation of a tractor and attachments

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignments covering practical skills and underpinning knowledge.

Unit 208 Tractor Driving

Outcome 1 Know the key components and operator controls on a tractor

Assessment Criteria

The learner can:

1. Name the **key components** that make up the build of a current tractor
2. Identify and explain the purpose of all **controls and instrumentation** of a modern tractor

Range

As appropriate to area of study:

Agriculture - Currently available Tractors over 35Kw

All Terrain vehicles (ATVs)

Unit content

Key components

Power unit*:* guards and covers, fuel tank and filters, cooling system, radiator / fan, pressure cap, coolant, filter screens, oil level indicators and filter, battery, transmission gearbox, final drive and reductions, four wheel drive axle, wheels, tyres and brakes, hydraulic reservoir and filters, drawbar and hitch(es), external services, power take off

Controls and instrumentation

Controls*:* Operator ergonomics, safety start device, start/heat start switch, clutch(es), brakes, transmission controls, hydraulic controls, power take off controls, cab heating/conditioning, hazard/indicator switches, lighting switches, four wheel drive, differential lock Instrumentation*:* Warning lights, audible warning signals, engine performance gauges, Analogue, digital, LED formats, data/performance storage systems

Unit 208 Tractor Driving

Outcome 2 Know the relevant legislation and codes of practice for tractor driving

Assessment Criteria

The learner can:

1. Outline the **relevant legislation** that apply to tractor driving
2. Outline the relevant **codes of practice** that apply to tractor driving
3. Define the **limitations imposed on young or inexperienced tractor drivers**

Range

As appropriate to area of study:

Agriculture - Currently available Tractors over 35Kw

All Terrain vehicles (ATVs)

Unit content

Relevant legislations

Road Traffic Act 1984 (as amended 1991), Health and Safety at Work etc Act (1974) (HASWA), Provision and Use of Work Equipment Regulations (1998), Control of Noise at Work Regulations (2005), Environment Protection Act 1990 (as amended 1995), Construction and Use Regulations 1986

Codes of practice

Highway code, Manufacturers' recommendations, risk assessments, use of Personal Protective Equipment (PPE)

Limitations imposed on young or inexperienced tractor drivers

Insurance policy compliance, evidence of instruction and training, certification, operating on the land, road restrictions, licensing laws, weight restrictions

Unit 208 Tractor Driving

Outcome 3 Be able to carry out simple maintenance tasks and settings to a tractor

Assessment Criteria

The learner can:

1. Carry out **pre-start checks** on a tractor
2. Perform **pre-operational maintenance** tasks prior to undertaking tractor driving operations
3. Carry out **adjustments to the tractor to match the operator** to the tractor
4. **Prepare** the tractor to accept a range of selected **attachments**

Range

Agriculture - Currently available Tractors over 35Kw-

All Terrain vehicles (ATVs)

Unit content

Pre start checks

Fuel level, oil level, coolant level/air screens clear, tyre condition / inflation pressures, transmission oil level, clean windows and mirrors, loads and attachments secure, brake check, road legal lighting, horn, screen wash/wipe, insurance, taxation, safety guards

Pre-operational maintenance

Replenish engine, transmission and hydraulic oil levels, check air intake screens/pre cleaner condition, drain fuel water trap, replenish radiator coolant levels, and adjust tyre pressures, replenish screen wash, brake/clutch fluids

Adjustments to the tractor to match the operator

Seat fore-aft position, seat height, seat suspension, seat rotation for field work / fixed for road work, control panel/joystick adjustments, rear view mirrors, heat and air conditioning settings

Prepare the tractor to accept attachments

Trailed equipment:
Drawbar: length, height, offset, swing, jaws, suitable hitch pins, safe load limit
Automatic pick up hitch: wear on hitch components, hitch lock adjustment, safe load limit
Linkage mounted equipment: correct category, stabilisers, sway chains, top link position, front linkage, maximum height setting, speed of drop setting
Auxiliary fitment: counterweight, wheel ballast, hydraulic connentions, electrical connections, remote controls, lighting sockets, marker boards, wheel track widths, tyre pressures

Unit 208 Tractor Driving

Outcome 4 Be able to operate tractor and attachments

Assessment Criteria

The learner can:

1. Drive a tractor **safely and efficiently** around to meet given objectives
2. Safely **hitch** selected attachments to a tractor
3. **Operate tractors** and attachments safely to meet given objectives
4. Prepare tractors and attachments for **storage** ensuring they are ready for future use

Range

As appropriate to area of study:

Agriculture - Currently available tractors over 35Kw
- linkage and trailed attachments relating to the agricultural land-based industry

All Terrain vehicles (ATVs)

Unit content

Safely and efficiently

Assess risks, operator/bystander injuries, stock, obstructions, ground conditions, public access, fuel consumption, emissions, tyre wear, damage to equipment

Hitch procedures

Assess risks, power unit isolation, external hydraulic controls, stored energy release, correct use of jacks, parking stands, attachment adjustment, road transport/field work

Operate tractors

Correct starting, use of gears/speeds, power take off engagement, hydraulic control, electrical control, mechanical remote control, wet, dry and icy conditions, slopes, field procedures, tramlining, markers, global positioning system

Storage

Cleaning, decontamination, disconnection of attachments, refuelling, storage of linkage connectors, check on condition, reporting procedures

Unit 208 Tractor Driving

Notes for guidance

This unit is designed to give learners sufficient theoretical and practical instruction to gain the necessary underpinning knowledge and practical skills to operate tractors safely and economically. The tractors and equipment should cover a range that the learner would be expected to encounter in their area of study. Learners will need access to a range of tractors incorporating the level of technology expected of modern day equipment. When undertaking operational tasks it is essential that all activities are closely supervised and learners are able to assess hazards and risk for each task.

Health and safety - centres and tutors need to be aware of the requirement to safeguard learners, particularly in relation to pre-16 learners, when delivering and assessing units where the operation of machinery is involved. Legally, learners can drive a tractor from the age of 13 (around a farm/workplace but not on the public highway) therefore it is essential that they are properly trained in this area. The units in this qualification require the learner to undertake tractor driving under close supervision, and this is the same for any unit within the qualification that requires the learner to operate or use machinery. The HSE guidance INDG185 'Tractor Action – a step by step guide to using tractors safely' is highlighted in the guidance section for this unit and tutors and learners are encouraged to follow these safe guidelines for operation. Additionally The HSE guidance AS10 'Preventing Accidents to Children on Farms' provides practical guidance on how to reduce the risk of injury to children under 13 and older children below the minimum school leaving age (usually 16).

Outcome 1 requires learners to familiarise themselves with a range of tractors typically used in their area of learning, Learners should be able to recognise all components of the tractor which will need the attention of the operator prior to, during and after land based operations.
Learners will be able to identify and explain all controls and instruments on a range of modern tractors.

In Outcome 2 the learners must demonstrate awareness of legal aspects of tractor driving, both on the land and on the road. They must also be aware of codes of practice, which, if not followed, could lead to health and safety infringements, injuries, or damage to property and/or equipment.

In Outcome 3 the learners will need to carry out basic service tasks and pre start checks to ensure a tractor is safe, legal and ready carry out land-based operations.

Throughout the unit the emphasis will be on safe, legal practices, working to manufacturers' recommended procedures and attention to detail when recording information. Depending on the land-based area the learner is studying, formal lecture delivery may be generic to all areas but practical experiences and learning should be appropriate to the area of study.

In Outcome 4, learners will be able to demonstrate their ability to safely start and drive a tractor around a set course that will include forward and reverse manoeuvres, transmission ratio selection and correct power unit settings. Following positive outcome in this element the learner will be required to match tractor to identified machines and demonstrate safe hitching and operating techniques. It is expected that learners will then demonstrate knowledge and ability to prepare tractors and attachments for storage. At all stages of practical work, the learner must conform to legislations and safe working practices and beware of hazards and risks which may change during the tasks being carried out.

Learners will need access to a range of modern tractors and machines typically available to their area of study. Due to the complexity of many modern tractors it is essential that operations be closely supervised to ensure safety at all times.

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Books

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Culpin C. 1992. *Farm Machinery, 12th edition.* Blackwell Science. ISBN: 0-632-03159-X.

Hawker M and Keelyside J**.** 1985. *Horticultural Machinery, 3rd edition.* Longman Higher Education. ISBN: 0-582-40807-5.

Journals

Farmers Weekly
Profi
Amenity Machinery and Equipment

Websites

www.hse.gov/pubns/indg185.pdf	Tractor Action
www.hse.gov.uk	Health and Safety Executive
www.roadtransport.com	Road Transport
www.direct.gov.uk/highwaycode	Public Services Website

Unit 209 Assist with Agricultural Crop Production

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of agricultural crop production 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.

The learner will develop practical skills as well as knowledge and understanding of how crops are grown on arable farms in the UK. They will have practical involvement in all of the four key stages, from field cultivations, application of fertilisers, regular crop monitoring through to harvesting and storage.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Know agricultural crops and their growth stages
2. Know common crop weeds, pests and diseases
3. Understand how crops are efficiently grown and harvested
4. Be able to assist with growing, harvesting and storage of agricultural crops

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

AgC4.1 Prepare sites for cultivation and planting AgC4.2

Cultivate sites for planting extensive crops AgC6.1

Maintain the healthy growth of extensive crops AgC6.2

Control unwanted vegetation

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SCC

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge

Unit 209 Assist with Agricultural Crop Production

Outcome 1 Know agricultural crops and their growth stages

Assessment Criteria

The learner can:

1. **Identify common agricultural crops** at different **stages of growth**
2. Describe the importance of **photosynthesis, water and nutrients** to the healthy growth of crops

Unit content

Crops

Oilseed rape (OSR), legumes, forage crops, wheat, barley, oats, root crops, beans, clover, grass, maize

Identify common agricultural crops

Recognise cereals (wheat including durum wheat, 2 and 6 row barley, oats, rye), OSR, roots (including potatoes, sugar and fodder beet, turnips), peas, beans, clover, maize

Stages of growth

Recognise their seeds, growth stages from seedling to maturity, relevant growth stages (Zadok's scale), shape of leaves, types of root structure (tap, adventitious, rhizome, stolen)

Photosynthesis, water and nutrients

Photosynthesis and growth, water uptake, osmosis, transpiration and wilting, function of the main major and minor nutrients, organic and inorganic fertilisers, humus

Unit 209 Assist with Agricultural Crop Production

Outcome 2 Know common crop weeds, pests and diseases

Assessment Criteria

The learner can:

1. Identify **common weeds, pests and diseases** for **specified crops** including cereals, root crops and forage crops
2. Outline the **significance** of weeds, pests and diseases for specified crops including cereals, root crops and forage crops

Unit content

Specified crops

Oilseed rape (OSR), legumes, forage crops, wheat, barley, oats, root crops, beans, clover, grass, maize

Common weeds

Grass weeds (annual meadow grass, chickweed, yorkshire fog, brome), broadleaved weeds (fat hen, couch, shepherds purse, brome, blackgrass, wild oats, cleavers, thistle, mayweed, black nightshade, field pansy, charlock, knotgrass, redshank)

Common pests

Insects (aphids, beetles, leatherjackets, wireworm, blackfly, pollen beetle), slugs, vermin (pigeons, starlings, rabbits, mice, rats)

Common diseases

Cereal diseases (mildew, eyespot, septoria, gout-fly, yellow rust, phoma, chocolate spot, blight, canker

Significance

Yield loss, carry over of disease, cost.

Unit 209 Assist with Agricultural Crop Production

Outcome 3 Understand how crops are efficiently grown and harvested

Assessment Criteria

The learner can:

1. Discuss factors that affect **establishment, growth and yield** of a **specified crop**
2. Explain **commonly used methods** of **harvesting and storing** specified crops including cereals, root crops and forage crops.

Range

Crop

One specified crop from: Oilseed rape (OSR), legumes, forage crops, wheat, barley, oats, root crops, beans, clover, grass, maize

Unit content

Establishment, growth and yield

Machinery for seedbed preparation, soil type and timing of establishment, germination, plant populations, competition from weeds, pests and diseases, weather, irrigation

Commonly used methods of harvesting and storing

Harvesting: machinery (combines, swathers, self-propelled forage harvesters, root harvesters)

Storage: Indoor on-floor store, bales, clamp (grass, beet, potatoes), bins, silo, boxes (potatoes)

Unit 209 Assist with Agricultural Crop Production

Outcome 4 Be able to assist with growing, harvesting and storage of agricultural crops

Assessment Criteria

The learner can:

1. Assist in the **selection, preparation, use and maintenance** of **crop cultivation machinery**
2. **Grow and monitor** agricultural crops
3. Explain the **harvesting and storage** of crops

Unit content

Selection, preparation, use and maintenance

Match tractor output to machine, use of machine manual in preparation and maintenance, field adjustments, cleaning for storage, Health and Safety considerations and requirements

Crop cultivation machinery

Sub-soiler, disc, plough, power harrow, single-pass machine, drilling/ planting machinery

Grow and monitor

Monitor crop emergence and growth throughout stages, field walking, crop recording of fertilisers and sprays, environmental impacts

Harvest and storage

Harvest machinery (including balers), crop maturity, crop storage (type of dryer, clamp silage, beet, potatoes), longevity of crop stored, safe storage, security

Unit 209 Assist with Agricultural Crop Production

Notes for guidance

This unit links both knowledge and practical skills in the production of a range of arable crops as grown throughout the UK. Although the unit aims at developing basic knowledge and practical skills in a wide range of crop production, the tutor will need to bear in mind local conditions and crops grown in the area. For example, sugar beet is more likely to be selected as a root crop in East Anglia, whereas fodder beet, swede or potatoes are more commonly found in the South-West. Where crops are not locally grown (maize), tutors should endeavour to enrich the student learning through visits, internet, etc. Regular crop walks (weekly or fortnightly) are an integral part of developing student learning and the tutor should aim to be creative in how these sessions are conducted.

Health and safety - Centres and tutors need to be aware of the need to safeguard learners, particularly in relation to pre-16 learners, when delivering and assessing units where the operation of machinery is involved. The units in this qualification require the learner to undertake machinery operations under close supervision, and this is the same for any unit within the qualification that requires the learner to operate or use machinery. The final LO is the only practical outcome and it requires the learner to assist in the selection, preparation, use and maintenance of crop cultivation machinery. The guidance in this unit requires that Health and Safety must be strictly enforced and repeated throughout. The HSE guidance AS10 'Preventing Accidents to Children on Farms' provides practical guidance on how to reduce the risk of injury to children under 13 and older children below the minimum school leaving age (usually 16).

Outcome 1 will need to be covered at the start and will form a useful introduction to the unit. It is envisaged that the sessions will largely take place in a classroom/lab and in the field. The tutor must ensure that the range of crops to be recognised is covered, either by crop walking on the centre's farm or other local farm enterprises. Use of the internet through illustrations could be used, but as a backup to having observed the crops in the field.

Outcome 2 will serve as a natural follow up to the first outcome, but it will link in to the following 2 outcomes for monitoring crops at all growth stages. Crop walks again should feature often in conjunction with theory sessions. It could form the basis of individual student crop recording for partial assessment purposes. Tutors will need to build into the programme crop walks weekly or at the minimum of once per fortnight. This will improve the learners' powers of observation and to imitate industry practice.

Outcomes 3 and 4 interlink, in that students need to know the theory associated with harvesting and storage before the students are involved in the practical skills. There should be opportunities for students to be involved in all the key crop stages, whether through work experience or a centre's own farm.

Tutors must be in a position to organise practical skills for learner involvement in tasks such as manure/fertiliser spreading, field cultivations, weed control through topping, silage/hay bale carting for example. Health and Safety must be strictly enforced and repeated throughout.

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UK Pesticide guide. CABI. 2009. ISBN: 978-1-845934-16-3.

Journals

Crops
Farm Contractor
Farmers Guardian
Farmers Weekly

Websites

www.fwi.co.uk	Farmers Weekly Interactive
www.efma.org	European Fertiliser Manufacturers Association
www.hgca.com	Home Grown Cereals Authority
www.newfarmcrops.co.uk	New Farm Crops
www.niab.com	National Institute of Agricultural Botany
www.defra.org.uk	Department for Environment, Food and Rural Affairs
www.defra.gov.uk	Department for Environment, Food and Rural Affairs
www.wales.gov.uk	Welsh Assembly Government
www.scotland.gov.uk	Scottish Executive Environment and Rural Affairs Department
www.dardni.gov.uk	Department of Agriculture and Rural Affairs (Northern Ireland)

Unit 210 Introduction to Grass and Forage Crop Production

Level: **2**

Credit value: **10**

Unit aim

This unit aims to provide learners with an understanding of the principles of grass and forage crop production 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.

This unit gives learners an understanding of the production, utilisation and conservation of grass and forage crops. It links to units on livestock production and farm mechanisation

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Know the common grass and forage crops and the factors that affect their growth
2. Know how to establish and maintain the production of grass and forage crops
3. Know how to operate livestock grazing systems
4. Be able to utilise grass and forage crops

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards This unit is linked to parts of a number of the NOS in Livestock Production and Agricultural Crop Production.

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge

Unit 210 Introduction to Grass and Forage Crop Production

Outcome 1 Know the common grass and forage crops and the factors that affect their growth

Assessment Criteria

The learner can:

1. Identify **commonly grown grass and forage crops**
2. Describe the **characteristics and use** of commonly grown grass and forage crops
3. Outline the **factors affecting** grass/forage crop **growth and production**.

Unit content

Commonly grown grass and forage crops

Grasses: ryegrasses, cocksfoot, timothy, meadow fescue

Forage crops: herbage legumes, kale, fodder roots, forage maize

Characteristics and use

Characteristics: regional distribution, and economic importance of grass and forage crops, differences between temporary and permanent grassland, use of varieties based on published data Uses: feeding animals (grazing, conserved grasses and forage crops), feed value, practical implications of feeding

Factors affecting growth and production

Soil types, climate, drainage, species/variety being grown, pests, weeds, diseases, competition, nutrient availability, crop management

Unit 210 Introduction to Grass and Forage Crop Production

Outcome 2 Know how to establish and maintain the production of grass and forage crops

Assessment Criteria

The learner can:

1. Describe **seedbed preparation** and **sowing** of grass and forage crops.
2. Describe **maintenance of** grass and forage crop **growth and production**

Unit content

Seedbed preparation

Sequence and importance of timing of field operations, seedbed preparation systems, nutrient requirements, seed rates and critical timing

Sowing

Selection of plant varieties, drilling methods, crop management, equipment, materials, fertiliser application, establishment targets, commonly found rotations

Maintenance of growth and production

Signs of poor productivity (causes of deterioration: acidity, poor drainage, weed ingress, poor growth and production, physical damage), identification and control of common weeds, pests and diseases, relevant Health and Safety legislation, Food and Environment Protection Act 1985 (FEPA), disposal of waste and pollution prevention.
Methods of improving swards (manuring, liming, drainage, mixed grazing, cutting and grazing, mechanical treatments, slit seeding)

Unit 210 Introduction to Grass and Forage Crop Production

Outcome 3 Know how to operate livestock grazing systems

Assessment Criteria

The learner can:

1. Identify **grazing systems**
2. Compare the different **methods of making high quality conserved grass and forage**.

Unit content

Grazing systems

Intensive and extensive, preparation for grazing, for example layout of systems, fencing, water provision, tracks, daily routines, welfare codes, strip grazing, paddock grazing, set stocking, zero grazing, and forward grazing

Methods of making high quality conserved grass and forage

Grass silage, maize silage, whole crop, hay, haylage, silos, bags, bales, methods and timing of cutting, wilting, harvesting, clamping, bagging, additives, storage process, health and safety, waste and liquor management, impact of weather and ground conditions on decision of time of harvesting

Unit 210 Introduction to Grass and Forage Crop Production

Outcome 4 Be able to utilise grass and forage crops

Assessment Criteria

The learner can:

1. Contribute to the **operation of a grazing system**
2. Contribute to the **making of high quality conserved grass or forage**

Unit content

Operation of a grazing system

Plan and move temporary fences, keep grazing records, measure sward heights, identify crop competitors, calculate and interpret T sums, identify timings for nutrient applications

Make high quality conserved grass or forage

Operations e.g. grass cutting, collection of crop from field, clamping, bagging or baling, storage, visual quality assessments

Unit 210 Introduction to Grass and Forage Crop Production

Notes for guidance

This unit is designed to provide the learner with sound knowledge and skills required to promote the production and utilisation of grass and forage crops. This unit gives tutors the opportunity to focus on the grass and forage crops found in the locality.

The purpose of this unit is to introduce learners to commonly found forage crops, the methods used to grow, harvest and store them and to the principles of livestock grazing programmes. Agricultural livestock workers must have a good understanding of these different topics in order to be able to assist in the production of high quality forage for feeding to a range of farm livestock.

Throughout the unit, the emphasis should be on health and safety. It is expected that learners will be aware of safe working practices and environmental issues and be familiar with accepted practices and behaviours within the context in which they are working, relevant health and safety issues, welfare codes of practice together with in order to minimise potential risks.

In Outcome 1 the learner will be required to consider the different types of forage crops grown on farms in the British Isles, and more specifically in their local areas. They will look at their respective characteristics at different stages of development and growth and how they are used within commonly found forage cropping systems.

Outcome 2 covers the common methods that are used to establish grass and other forage crops. The learner will have an opportunity to consider the factors that contribute to sward deterioration and how the productivity of a sward can be improved.

In Outcome 3 learners will look at livestock grazing systems and the impact of grassland management on forage longevity and productivity. They will consider the nutritional requirements of grass and forage crops, and look at the control of weeds and crop pests/diseases.

Outcome 4 covers the operation of a grazing system and will enable learners to put the knowledge developed in Outcome 3 into practice. Learners will also look at the factors that impact of the quality of conserved forage, and methods by which high quality conserved forage can be made. It is anticipated that learners will be given the opportunity to assist with an aspect of forage conservation, to enable them to develop some practical skills and experience the operations required in grass and forage crop conservation. Examples of learner involvement may range from carrying out a visual assessment of the grass or other forage crop before or after cutting to driving a tractor to collect the crop from the field, depending on the learner's prior experience and competence. Also included is the essential consideration of the relevant health and safety issues, welfare codes of practice together with environmental issues in order to minimise potential risks.

Centres are encouraged to introduce employers and specific professionals from industry to provide interesting and relevant information to the learner.

It is accepted that some formal lectures will be necessary at Level 2, but for this unit it is recommended that they are linked directly with interactive lessons in the working environment. Learners must be given the opportunity to see a range of forage crops and grazing systems to reflect current industry practice in the locality.

Unit 210 Introduction to Grass and Forage Crop Production

References

Unit 210 Introduction to Grass and Forage Crop Production

Books

Notes for guidance

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Journals

Arable Farming Crops
Farmers Weekly
Farmers Guardian

Unit 211 Introduction to Animal and Plant Biology

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of animal and plant biology. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The learner will explore the basic concepts of biology. They will begin by considering the functional characteristics of all living organisms, the cellular basis of life and the diversity of organisms. They will then investigate how animals and/or plants are able to grow, live and reproduce. This includes investigating how organisms obtain their energy, the systems involved and how heritable characteristics are passed on to the next generation.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Know the classification of organisms and the structure of the cell
2. Understand the requirements for nutrition and growth of animals and plants
3. Know the main systems and structures in animals and plants
4. Understand the processes of reproduction and heredity in animals and plants

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

AgC6 Monitor and maintain the healthy growth of extensive crops
CU36 Enable animals to reproduce and care for their young
CU73 Propagate plants from seed
L2 Establish plants outdoors
LP7 Provide feed and water to animals

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge

Unit 211 Introduction to Animal and Plant Biology

Outcome 1 Know the classification of organisms and the structure of the cell

Assessment Criteria

The learner can:

1. Identify the **components** of a plant cell or an animal cell
2. Describe the **functions of the main organelles**
3. Identify a specified organism using an **identification key**

Unit content

Components

Animal cell: ientification (both appearance and main functions) of the following animal cellular organelles: plasma/cell membrane, cytoplasm, nucleus, mitochondria, ribosomes, lysosomes, Endoplasmic Reticulum

Plant cell: cell wall, chloroplast, cytoplasm, nucleus, lamella, pits or pores, endoplasmic reticulum (smooth and rough), plastids, vacuole, mitochondrion (a)

Functions of the main organelles

Nucleus (organisation of cell processes), mitochondria, (respiration, energy production), lysosome (digestion), Endoplasmic Reticulum (Smooth: lipid synthesis, detoxification, metabolism of carbohydrates, Rough: protein synthesis), ribosome (protein synthesis), Golgi apparatus (designation of proteins)

Chloroplast (photosynthesis) cytoskeleton (cellular structure), vacuoles and vesicles (storage), cell membrane and cell wall (transportation of products in and out of the cell)

Identification key

Single access keys, multi access keys, binomial nomenclature of organisms (genus, species)

Unit 211 Introduction to Animal and Plant Biology

Outcome 2 Understand the requirements for nutrition and growth of animals and plants

Assessment Criteria

The learner can:

1. Identify the **requirements for nutrition and growth** in animal and plants
2. Describe the **sources of nutrition** for animals and plants

Unit content

Requirements for nutritional and growth

Water, protein, carbohydrate, lipid (fat), vitamins and minerals, macronutrients and micronutrients

Sources of nutrition

Animals: sources of protein, fats and carbohydrates, forage, concentrates, supplements, milk for young animals

Plants: minerals, soil, outline process of photosynthesis, fertilizer, and outline process of cellular respiration

Unit 211 Introduction to Animal and Plant Biology

Outcome 3 Know the main systems and structures in animals and plants

Assessment Criteria

The learner can:

1. Identify the main **biological systems** in animals and plants
2. Describe how a specified **system functions** in animals and plants

Unit content

Biological systems

Animals: musculo-skeletal, cardiovascular, respiratory, gastrointestinal, reproductive, urinary, nervous, endocrine and the integument

Plants: vegetative parts (roots, stem, shoots, buds, leaves), reproductive parts (flowers, stamen, stigma), vascular system (xylem, phloem)

System functions

Energy metabolism, ingestion, digestion, respiration, reproduction, excretion, immunity, transport and circulatory, hormonal and neural control, homeostasis, movement, support

Unit 211 Introduction to Animal and Plant Biology

Outcome 4 Understand the processes of reproduction and heredity in animals and plants

Assessment Criteria

The learner can:

1. Describe the **life cycles** of animals and plants
2. State how characteristics are **inherited**

Unit content

Life cycles

Animals: neonate, juvenile, adult, reproductive strategies, reproduction

Plants: germination, root and shoot growth, asexual and sexual reproduction

Inheritance

Genetic terminology: chromosome, gene, allele, genotype, phenotype, characteristic, trait, recessive, dominant, filial generation, Mendelian principles of inheritance, simple monohybrid crosses, use of punnet squares

Unit 211 Introduction to Animal and Plant Biology

Notes for guidance

This unit is designed to provide the learner with the knowledge and skills required to consider the functional characteristics of living organisms. This unit will differ according to the sector that the unit is delivered through. The unit should cover a range of species as appropriate to the area of study and include both plant and animal species.

The study of both plant and animal species should be given equal emphasis in order to provide the learner with a thorough grounding in the functional characteristics of living organisms. It is expected that learners will be aware of the biological systems of both plants and animals, be familiar with the metabolic, growth and reproductive processes utilised by both and be able to explain the basic genetic principles of inheritance.

In Outcome 1 the leaner will be required to identify the classification of organisms and describe the structure of the plant and animal cell. It is accepted that this outcome will require some formal delivery but would be complemented via practical delivery in the laboratory via microscopic investigation of cells or by practical use of identification keys in 'real life' scenarios. Learners will benefit from access to good quality audio-visual teaching materials during delivery of this outcome.

In Outcome 2 the learner is required to describe sources of nutrition and the nutritional requirements for growth in plants and animals. It is anticipated that the delivery of this outcome will be predominantly classroom based, but relevance and interest could be enhanced through the use of practical experiments, for example to identify the nutrient value of different feedstuffs. Visits to vocationally relevant settings, and the opportunity to witness and take part in animal and plant feeding, would be particularly beneficial.

In Outcome 3 the learner is required to identify the main biological systems in plants and animals, and to describe their main functions. Emphasis should be placed on the functionality of the named systems, and delivery should link relevant anatomy to physiological processes. It is expected that delivery of this outcome will be theory based, but it would be beneficial to include laboratory sessions to identify the systems and discuss their key features.

Outcome 4 requires the learner to describe the lifecycles of a range of plant and animal species, and to explain the process of inheritance. Learners should be allowed the opportunity to cover different types of animals and plants relevant to the qualification being studied and personal interest. It will be beneficial for learners to see examples of plants and animals at different life stages, and to see practical examples of inheritance to supplement classroom based delivery.

Learners working towards level 2 are likely to have had experience of the basic concepts of animal and plant biology. This unit aims to extend the learners knowledge to enable more detailed consideration of the biological processes that enable plants and animals to function, grow and reproduce. It is important that the learner develops the ability to apply the biological systems and processes covered to their wider role in maintaining the functionality of the organism. Emphasis should be placed on the links between nutrition and genetics to biological functions.

References

Books

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Dallas S. 2006. *Animal Biology and Care.* Wiley Blackman. ISBN: 1-405-13795-9. Williams J. 2009. *The Complete Textbook of Animal Health and Welfare*. WB Saunders. ISBN: 0-702-02944-0.
Any GCSE or A-level Biology textbook

Journals

Biologist
New Scientist
Biological Sciences Review

Websites

www.bbc.co.uk/schools/gcsebitesize/biology BBC GCSE Bitesize Biology
www.biologyguide.net Biology guide – A Level Revision Notes

Unit 212 Introduction to Land-based Workshop Practice

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of land-based workshop practice 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.

The learner will cover the basic work requirements within land-based workshops. They will understand the importance of Health and Safety as an integral topic. They will learn how to safely use hand and power tools and basic welding equipment commonly found in a land-based setting. The skills associated with these will be integrated with the development and use of basic maintenance and repair techniques.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Be able to safely use commonly found hand and power tools for the maintenance and repair of land-based machinery and installations
2. Be able to safely use basic welding and cutting equipment
3. Be able to safely use basic maintenance and/or repair techniques on land-based machinery and installations
4. Understand land-based workshop health and safety requirements.

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

CU1 Maintain safe and effective working practices

CU27 Maintain equipment and machines

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 212 Introduction to Land-based Workshop Practice

Outcome 1 Be able to safely use commonly found hand and power tools for the maintenance and repair of land-based machinery and installations

Assessment Criteria

The learner can:

1. Select and safely use **hand** and **power tools** to meet given objectives **maintaining** or **repairing** land-based machinery or installations
2. State **reasons** for the hand and power tools selected

Range

All learning disciplines: hand held manually operated tools to carry out basic service, maintenance and component replacement tasks.

Unit content

Hand tools

Spanners, wrenches, socket sets, keys, gripping tools, drivers, punches, torque setting, pressure measurement, marking out tools, measuring devices

Power tools

Drills, metal cutters, battery/mains, electrical powered, pneumatic, hand held, bench mounted

Maintaining

Routine maintenance, periodic maintenance, wearing component replacement, tool maintenance

Repairing

Workshop based, emergency on work site, belts/pulleys, chains/sprockets, gears/shafts, bearings, bushes, seals

Reasons

Justification for selection, appropriateness, availability, safety

Unit 212 Introduction to Land-based Workshop Practice

Outcome 2 Be able to safely use basic welding and cutting equipment

Assessment Criteria

The learner can:

1. Safely use **basic welding equipment** and **materials** to produce a simple welded joint to meet given objectives
2. State reasons for the **basic welding equipment** and **materials** selected

Range

All learning disciplines: preparation and metal joining of materials up to 3mm thickness for oxy/ fuel welding and up to 8mm for MMA and MIG techniques. Lap, butt and fillet welds to a given standard, Personal Protection Equipment (PPE)

Unit content

Basic welding equipment

Oxygen, propane, acetylene gasses- canisters, bottles, safe handling and storage
Gauges, hoses and fittings- mixing torch and nozzle selection, flame types and pressures, rods, flux and techniques
Manual metal arc/inert gas welder design, input/output voltage settings, amperage settings, rods, coatings and techniques
Inert gasses/argon, wire diameter, speed, nozzles and shrouds, MIG techniques

Materials

Ferrous/ non ferrous material choices, melting temperatures, suitability for purpose

Unit 212 Introduction to Land-based Workshop Practice

Outcome 3 Be able to safely use basic maintenance and/or repair techniques on land-based machinery and installations

Assessment Criteria

The learner can:

1. Safely use **basic techniques** to **maintain** or **repair** land-based machinery or installations to meet given objectives
2. State reasons for the **basic techniques** selected

Range

All learning disciplines: carry out routine, periodic and unscheduled maintenance on machines typical to the individual's area of study for example those used for grass cutting/collection, ground preparation or cultivation, crop/materials transportation, fixed equipment/installations, PPE

Unit content

Basic maintenance techniques

Systematic routine maintenance, follow manufacturers' service charts, operator manual instructions- non routine/periodic maintenance tasks, wearing component adjustments- lubrication, pressures

Basic repair techniques

Component replacement, bearings bushes, seals, driveline components- remanufacture, brackets, guards

Unit 212 Introduction to Land-based Workshop Practice

Outcome 4 Understand land-based workshop health and safety requirements

Assessment Criteria

The learner can:

1. Explain the importance of **health and safety** in the **workshop**
2. Produce a suitable **risk assessment** for the use of hand and/or power tools to meet given objectives

Range

All learning disciplines: to be made aware of Health and Safety at Work etc Act 1974, Provision and Use of Work Equipment Regulations 1998 (PUWER), Lifting Operations and Lifting Equipment Regulations 1998 (LOLER), Control of Substances Hazardous to Health 2002 (COSHH), first aid procedures, minor injuries and burns, fire prevention and use of fire extinguishers, Personal Protective Equipment (PPE).

Unit content

Health and safety

Safe working areas, ventilation, lighting, PPE, correct storage, electrical testing procedures, safe lifting procedures

Workshop

Designated welding, grinding areas, fume extraction, service bays, work areas on site, environmental hazards

Risk assessment

Assessing risks prior to work, injury, damage to self, others and equipment-control measures identified- recording and storing information

Unit 212 Introduction to Land-based Workshop Practice

Notes for guidance

This unit is designed to provide the learner with the knowledge, understanding and practical skills required to maintain a range of machines and equipment used in land-based operations. The maintenance tasks may be scheduled as periodic- daily, weekly, monthly or yearly or routine, where it is expected the machine is inspected at regular intervals during work to ensure efficiencies. Unscheduled repairs may need to be carried out in the event of breakdowns. These repairs may have to be carried out on site. Emphasis will be on safe and efficient working practices throughout the unit.

Health and safety - Centres and tutors need to be aware of the need to safeguard learners, particularly in relation to pre-16 learners, when delivering and assessing units where the operation of equipment and machinery is involved. This unit requires the learner to undertake equipment and machinery operations under close supervision, and this is the same for any unit within the qualification that requires the learner to operate or use machinery. This is a largely practical-based unit which looks at the basic use and maintenance of hand and power tools and equipment and machinery. There is significant emphasis on safe practices throughout the unit. Throughout the unit the emphasis is on acceptable health and safety procedures and safe working practices. The guidance in this unit requires that Health and Safety must be strictly enforced and repeated throughout. The HSE guidance AS10 'Preventing Accidents to Children on Farms' provides practical guidance on how to reduce the risk of injury to children under 13 and older children below the minimum school leaving age (usually 16).

In Outcome 1, the learner will be required to identify appropriate tools needed to perform basic maintenance and repair techniques to meet given objectives. The learner should be able to demonstrate correct and safe use of chosen tools, explain limitations and suggest alternative strategies. Delivery should also include the care and maintenance of tools.

In Outcome 2, the learner will become familiar with a range of thermal metal joining techniques and equipment needed to carry out welding tasks to meet given objectives. It is anticipated that delivery of this unit will be largely practical. As part of this outcome, the learner should be able to recognise different materials and their properties and have an understanding of alternative welding/repair strategies. Welding is potentially dangerous so particular emphasis should be placed on safe working practices.

In Outcome 3, the learner will be required to demonstrate acceptable safe working practices whilst repairing and maintaining machines and equipment. A range of tasks should be covered to include both maintenance and repair techniques. A portfolio of records for each task should contribute towards assessment material. It is expected that some tasks may have several acceptable strategies and the learner will be expected to justify the chosen strategy.

Outcome 4 the learner is expected to demonstrate understanding of health and safety procedures in the workshop and carry out risk assessments. As part of this outcome the learner should carry out an inspection to the work premises and equipment to highlight any hazards, risks or discrepancies which may impair safe working practices. The risk assessments throughout this unit may contribute to the assessment evidence for this outcome.

References

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Unit 213 Assist with Agriculture Habitat Management

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of agricultural habitat management 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.

The learner will investigate locally occurring farm habitats and their ecology. They will look at methods commonly used to identify farm habitats and wildlife and will develop practical maintenance skills for farm habitats.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Be able to identify farm habitats and wildlife species
2. Know the ecology of farm habitats
3. Know how to carry out farm habitat maintenance
4. Be able to carry out maintenance tasks

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

CU87 Carry out habitat management work

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge

Unit 213 Assist with Agriculture Habitat Management

Outcome 1 Be able to identify farm habitats and wildlife species

Assessment Criteria

The learner can:

1 Assist with **surveying** of given **farm habitats**

2 Identify **farm habitats**

3 Identify **wildlife species**

Unit content

Farm habitats

Selection of local farm habitats (hedgerows, meadows, wildflower fields, field boundaries, arable crops, woodland, streams and watercourses, ponds, stone walls)

Surveying

Quadrat and transect surveys

Present information from surveys in various forms (written, data and pictorial) graphs, pie chart, basic statistics

Wildlife species

Flora and fauna (invertebrates, amphibians, reptiles, birds, mammals) as appropriate to habitat

Unit 213 Assist with Agriculture Habitat Management

Outcome 2 Know the ecology of farm habitats

Assessment Criteria

The learner can:

1. Outline **ecological characteristics** of given **farm habitats**
2. Describe the ecology and habitat requirements of one farm habitat **wildlife species**.

Unit content

Farm habitats

Selection of local farm habitats (hedgerows, meadows, wildflower fields, field boundaries, arable crops, woodland, stream and watercourses, ponds, stone walls)

Ecological characteristics

Characteristics of habitats: location, climate, soil type, rainfall, temperature, flora and fauna, species interaction, ecosystems

Wildlife species

Flora and fauna (invertebrates, amphibians, reptiles, birds, mammals) as appropriate to habitat, for example fox, badger, brown hare, rabbit or relevant bird species

Unit 213 Assist with Agriculture Habitat Management

Outcome 3 Know how to carry out farm habitat maintenance

Assessment Criteria

The learner can:

1. Describe how to identify **hazards and risks**
2. State the **purpose of farm habitat maintenance**
3. Describe the operation of **farm habitat maintenance tasks**

Unit content

Hazards and risks

Hazards appropriate to farm habitat, risks associated with those hazards,
Health and Safety at Work Act (1974), risk assessment, identification of relevant personal protective equipment, manufacturer's instructions, data sheets, lone working, safe working protocols, safe use of machinery and tools (initial checks, servicing, maintenance), waste materials and their classification

Purpose of farm habitat maintenance

Repairs, improvements, conservation, economy, security, boundaries, creation and protection of habitats, National schemes and grants for example Environmental Stewardship Scheme

Farm habitat maintenance tasks

Methods used to create and maintain farm habitats for example fencing, coppicing, hedge laying, pond formation and clearance, land clearance, establishing and maintaining boundaries

Unit 213 Assist with Agriculture Habitat Management

Outcome 4 Be able to carry out maintenance tasks

Assessment Criteria

The learner can:

1. Safely carry out **farm habitat maintenance tasks** to meet given objectives
2. Keep the site clear of unnecessary **obstacles and waste materials**
3. Outline **improvements** to farm habitat maintenance

Unit content

Farm habitat maintenance tasks

Methods used to create and maintain farm habitats for example fencing, coppicing, hedge laying, pond formation and clearance, land clearance, establishing and maintaining boundaries

Obstacles and waste materials

Waste materials: non hazardous and hazardous waste, animal waste, plant waste, chemical waste

Obstacles: any structure or item detrimental to habitat management

Improvements

Further maintenance that could enhance the habitat

Unit 213 Assist with Agriculture Habitat Management

Notes for guidance

The learner will investigate locally occurring farm habitats and their ecology. They will look at methods commonly used to identify farm habitats and wildlife and will develop practical maintenance skills for farm habitats.

This unit should consider a full range of farm habitats, a representative range of flora and fauna species (plants, mammals, reptiles, invertebrates, birds) with specific emphasis on common wildlife species found in agricultural habitats. It should aim to take advantage of the local and national biogeography e.g. Upland and lowland farms, to enable the learner to fully engage with the diverse range of agricultural habitats in the British Isles.

In Outcome 1, the learner will develop basic surveying abilities and practical opportunities to develop core skills are necessary to compliment formal delivery. A range of farm habitats should be available for study and a variety of sampling methods practically undertaken. Learners should be encouraged to plan, undertake and reflect on sampling in reference to method, sources of error, results, conclusions drawn, legislation and health and safety.

In Outcome 2 the learner is required to identify the main ecological concepts applicable to specific habitats and to contextualise these for specific agricultural habitats and wildlife species allowing investigation of the biotic and abiotic factors that contribute to the development of ecosystems. It is anticipated that the delivery of this outcome will be through formal lectures, but it is envisaged that practical access to a range of agricultural habitats would be required to enable experiential learning via field trips and practical evaluation of habitats.

In Outcome 3, the learner is required to be able to apply current legislation to the safe performance of routine farm habitat maintenance. A range of commonly undertaken farm habitat maintenance tasks should be practically performed or observed, and the learner will develop the skills to plan, perform and relate habitat maintenance to the development or conservation of agricultural ecosystems with due regard for health and safety. Reference to National and Defra initiatives and the role of diversification in agriculture should be included in delivery. It is expected that delivery of this outcome will be through a combination of formal lectures and interactive activities and it would be beneficial to include case studies or farm visits to enhance the learning experience. .

Outcome 4 requires the learner to describe methods for safe disposal of hazardous and non-hazardous waste generated in agricultural habitats. The potential impact of accumulation of waste in relation to habitat management and wildlife should be discussed. The performance of routine habitat maintenance tasks will generate waste products and the learner will be expected to demonstrate correct disposal methods. Delivery is expected to be via formal lectures combined with interactive activities; for learners where access to farm habitats is limited contextualisation employing case studies and the integration of vocational guest speakers is advised.

Learners working at Level 2 are expected to have some underpinning knowledge in animal and plant biology, and should be able to relate this to the subjects studies in this unit. This unit aims to build upon foundation knowledge to expose the interaction between species and agricultural practices within specific farm habitats, and their short and long term effect upon these habitats. Equal emphasis should be placed on the development of practical skills and the necessary knowledge to be able to survey farm habitats and manage them in terms of wildlife, flora and economic viability.

Centres are encouraged to introduce employers and specific professionals from industry to provide

interesting and relevant information to the learner. Teaching would also benefit from visits to a variety of habitats to add depth to the learner experience.

It is accepted that formal lectures will be necessary at Level 3 but for this unit it is necessary to compliment this with practical opportunities and recommended to introduce interactive sessions in a real environment.

References

Books

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Brower JE, Jerrold HZ and Von Ende CN. 1997. *Field and laboratory methods for General Ecology 4th Edition.* McGraw-Hill Education. ISBN: 0-697-24358-3.
McGavin GC, Fletcher N, Hume R, Coombes A, Gibson C, Kibby G and Parker S. 2008. *RSPB Wildlife of Britain (DK Reference).* Dorling Kindersley. ISBN: 1-405-32932-7.
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Sterry P. 2008. *Collins Complete Guide to British Wildlife: A Photographic Guide to Every Common Species*. Collins. ISBN: 0-007-23683-2.
Sterry P. 2008. *Collins Complete Guide to British Birds: A Photographic Guide to Every Common Species*. Collins. ISBN: 0-007-23686-7.
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Websites

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www.wales.gov.uk	Welsh Assembly Government
www.scotland.gov.uk	Scottish Executive Environment and Rural Affairs Department
www.dardni.gov.uk	Department of Agriculture and Rural Affairs (Northern Ireland)
www.ukagriculture.com	UK Agriculture
www.wildlifetrusts.org	Wildlife Trusts
www.nationalparks.gov.uk	National Parks
www.rspb.org.uk	Royal Society for the Protection of Birds
www.wildaboutbritain.co.uk	Wild about Britain
www.woodlandtrust.com	The Woodland Trust
www.british-trees.com	Part of the Woodland Trust
www.britishtrees.co.uk	British Trees and Shrubs
www.bbc.co.uk/nature	BBC
www.countrysideinfo.co.uk	Offwell Woodland & Wildlife Trust
www.habitat.org.uk	Habitat
www.naturescape.co.uk	Naturescape – Native British Wild Flowers

Unit 214 Environmental Protection and Improvement

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of environmental protection and improvement 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.

The learner will investigate potential harm to the environment, how we manage waste and the importance of sensitive sites and habitats.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Know potential causes of harm to the environment
2. Know principles and practices of waste management
3. Be able to assess the significance of environmentally sensitive sites
4. Be able to maintain and improve habitats

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

CU87 Carry out habitat management work

EC18.1 Encourage community involvement in recycling

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 214 Environmental Protection and Improvement

Outcome 1 Know potential causes of harm to the environment

Assessment Criteria

The learner can:

1. Identify **sources of pollution** in given environments
   - water
   - air
2. Describe potential **sources of human environmental damage**
3. Outline **measures used to minimize human environmental damage**

Unit content

Sources of pollution

Human, animal pollution, waste products, litter, rubbish, transport fumes, noise, light pollution

Sources of human environmental damage

Vandalism, waste dumping, human traffic, tourism, damage by compaction and wear, litter, dog fouling, leisure activities, construction activities, inappropriate agricultural management activities, inappropriate waste disposal methods

Measures to minimize human environmental damage

Education and training, interpretation boards and notices/signs, prohibition (fencing, limited access, restricted areas), recycling, minimizing consumption and waste products, use of biodegradable materials and products

Unit 214 Environmental Protection and Improvement

Outcome 2 Know principles and practices of waste management

Assessment Criteria

The learner can:

1. Describe methods and resources used for **storing and disposing of organic animal wastes**
2. Describe the **principles of composting**
3. Outline **legislation that influences waste management**

Unit content

Storing and disposing of organic animal waste

Muck heaps, slurry stores, muck spreading, timing of operations

Principles of composting

Controlled biological decomposition and conversion of solid material into a humus like material (compost), aerobic (requiring oxygen) reaction
Use of micro- organisms such as bacteria and fungus to break down organic material into simpler substances, requirement for air, moisture and heat (correct temperature)

Legislation that influences waste management

Environmental Protection Act 1990, Cross Compliance Nitrates Directive 1991, Water Framework Directive 2003, Waste Management (England and Wales) Regulations 2006. National authorities with responsibility for waste and recycling issues: Environmental Agency in England and Wales, the Scottish Environmental Protection Agency in Scotland and the Department of the Environment in Northern Ireland

Unit 214 Environmental Protection and Improvement

Outcome 3 Be able to assess the significance of environmentally sensitive areas

Assessment Criteria

The learner can:

1. Plot **habitats on a farm map**
2. Assess **common habitats**
3. Describe the **features of habitats** that support wildlife species:
   - water features
   - woodlands
   - grassland
   - hedgerows

Unit content

Habitats on a farm map

Pasture areas, hay meadows, hedgerows, shelter belts, woodland, water courses and wet areas, field margins, ditches, banks, walls

Common habitats

Water features, woodlands, grassland, hedgerows, moorland, lowland heath, peat bogs

Features of habitats

For water features, woodlands, grassland and hedgerows: location, topography, shelter, proximity to boundaries or other structures, climate, soil type, rainfall, temperature, food supply, flora and fauna

Unit 214 Environmental Protection and Improvement

Outcome 4 Be able to maintain and improve habitats

Assessment Criteria

The learner can:

1. Select and use appropriate **tools and equipment**
2. Carry out **habitat maintenance and improvement** safely according to site management plans
3. Promote the **reduction, re-uses, and/or recycling of materials**

Unit content

Tools and equipment

Hand tools: spades, forks, shovels, secateurs, handsaws, clippers, hammers, pickaxes, hand fencing equipment, safe and correct use, maintenance and storage, sharpening of tools where appropriate, suitable clothing and Personal Protective Equipment (PPE)

Habitat maintenance and improvement

Mowing, renovation, planting and staking as applicable, clearing (path, fence line), coppicing, uprooting, hedge maintenance, pruning, thinning, cutting or mowing and mulching, pond, stream and ditch clearance

Reduction, re-uses, and/or recycling of materials

Composting, materials that can be composted, re-used and/or recycled, finding alternative uses, methods of recycling, avoid wastage

Unit 214 Environmental Protection and Improvement

Notes for guidance

This unit allows the learner to review and manage habitats. It gives the learner knowledge of habitat types and requirements as well as knowledge of management plans and the use of tools to maintain and improve habitats. The unit lends itself to a high level of practical real working environment experience. Habitat plans can be developed by project work and group activity.

Use of tools must be carried out with emphasis on safe use throughout not just for the user but those near to hand. Much habitat management work is often carried out with volunteers inexperienced in use of tools and equipment.

Health and safety - Centres and tutors need to be aware of the need to safeguard learners, particularly in relation to pre-16 learners, when delivering and assessing units where the operation of machinery is involved. This unit requires learners to use a range of tools and equipment. Pre-16 learners must perform these tasks under close supervision to ensure their own safety and the safety of others. The guidance in this unit requires that Health and Safety must be strictly enforced and repeated throughout. The HSE guidance AS10 'Preventing Accidents to Children on Farms' provides practical guidance on how to reduce the risk of injury to children under 13 and older children below the minimum school leaving age (usually 16).

Outcome 1 requires that the learner be able to identify and describe causes of damage/pollution to the environment. It also requires that the leaner is able to identify measures to reduce damage. Learners should be encouraged to review a range of sites and, through in-class work, report and develop ideas.

Waste management is covered in Outcome 2 with an emphasis on organic waste. Organic waste includes animal waste and green material. An understanding of the principles of composting is developed here and it is recommended that in addition to classroom based work a compost heap is examined so that the requirements for good composting are understood.

Outcome 3 enables the learner to identify and plot a range of habitats on a farm map. This necessitates a field/farm visits and recording for subsequent writing up. It also requires the learner to assess an area for its usefulness as a wildlife habitat. Water features, woodlands, grassland and hedgerows should be looked at here as well as, if applicable, sandy, dry or wet and marshy areas. Some habitats are micro-scale and localised to the holding whilst others are more large scale geographical/topological and this distinction should be explained to the learner.

The learner carries out practical tasks in Outcome 4 to enable them to select and use equipment. Emphasis here must be on safe use of tools and equipment. Suitable clothing and PPE (personal protective equipment) should be identified and worn. Powered tools should not be used unless well supervised and training has been given. The use of certificated equipment such as chainsaws should be prohibited. Learners need to be advised of the risks of tool and equipment use not only to themselves but also to people, animals and property. The frequent use of relatively inexperienced volunteers in habitat management should be made clear. There will be a need to identify hazards and assess risks before any work is carried out and this must be emphasized before any work commences.

Centres are encouraged to use site visits as well as outside professionals from industry to enhance the learning FWAG (Farming and Wildlife Advisory Group) should be referred to as examples of good practice and sources of advice. Where possible a visit to a Linking Environment and Farming (LEAF) farm should be supported.

References

Books

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www.fwag.org.uk	Farming and Wildlife Advisory Group
www.naturalengland.org.uk	Natural England

Unit 215 Understand British Wildlife Species, Habitats and Rehabilitation

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of British wildlife species, habitats and rehabilitation. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or to further education and training.

The learner will be able to recognise indigenous wildlife and their habitats. They will be able to understand threats to British wildlife and human intervention to save endangered species. The learner will explain the process of wildlife rehabilitation, from the initial assessment to choosing the release site, culminating in a comparison of wildlife monitoring techniques post rehabilitation.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Know indigenous species and their habitat
2. Understand human intervention in wildlife matters
3. Understand the process of wildlife rehabilitation
4. Understand the release and monitoring of wildlife

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

AC 20.1 Release Animals

CU 34.1 Promote and maintain the health and well-being of animals

CU 34.2 Deliver basic treatments to animals

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge

Unit 215 Understand British Wildlife Species, Habitats and Rehabilitation

Outcome 1 Know indigenous species and their habitat

Assessment Criteria

The learner can:

1. Identify indigenous **British wildlife** in **specified habitats**
2. Identify **signs** of wildlife within habitats:
   - Tracks
   - Faeces
   - Shelter
   - Runs
3. Describe **habitat requirements** for endangered British wildlife
4. Match indigenous **British wildlife** to their habitat

Unit content

British wildlife species

Reptiles, amphibians, birds, mammals, invertebrates and fish

Specified habitats

Woodlands, freshwater, estuary & costal, hedgerows and verges, marshes, grasslands, heath lands and uplands

Signs

Tracks, faeces, shelters and run

Habitat requirements

Environment, (flora, shelter, soil), food, water

Endangered British wildlife

Reptiles (e.g. adder, common lizard, sand lizard), amphibians (e.g. great crested newt, natterjack toad), birds (e.g. corncrake, red kite), mammals (e.g. greater horseshoe bat, brown hare, red squirrel), invertebrates (e.g. stag beetle, white admiral), fish (e.g. brown trout, spiny seahorse)

Unit 215 Understand British Wildlife Species, Habitats and Rehabilitation

Outcome 2 Understand human intervention in wildlife matters

Assessment Criteria

The learner can:

1. Discuss the main **threats** to British wildlife
2. Illustrate how **human intervention** can minimise the threats to one endangered species of British wildlife

Unit content

Threats

Habitat fragmentation, human encroachment, climate change, pollution, introduced species, competition, disease, Road Traffic Accidents (RTA's), hunting, illegal trade, habitat destruction

Human intervention

Rehabilitation, nature reserves, legislative protection e.g. European Directives, Wildlife and Countryside Act 1981 (as amended 1991), Wild Mammals (Protection) Act 1996, Convention on International Trade in Endangered Species (CITES), Countryside and Rights of Way Act (2000), education

Unit 215 Understand British Wildlife Species, Habitats and Rehabilitation

Outcome 3 Understand the process of wildlife rehabilitation

Assessment Criteria

The learner can:

1. Explain the process of **initial assessment** of wildlife casualties
2. Discuss the process of **wildlife rehabilitation** from receiving the initial assessment results back to good health
3. Discuss the **ethics** of rehabilitating wildlife

Unit content

Initial assessment

Physical signs e.g. bleeding, loss of fur/feathers, limping, vomiting, heavy breathing, temperature, pulse, respiration, behaviour
Diagnosis: clinical tests, blood tests, urine and faecal analysis
Equipment used: crush cage, noose, catch pole, towel, gloves/gauntlets, muzzles, goads, nets, bags, hoods, Personal Protective Equipment (PPE)

Wildlife rehabilitation

Accommodation requirements: intensive care, hospitalisation, recovery, rehabilitation

Husbandry: feeding, monitoring, hygiene, routine health care

Ethics

Reasons for rehabilitating wildlife, reasons against rehabilitating wildlife, codes of practice

Unit 215 Understand British Wildlife Species, Habitats and Rehabilitation

Outcome 4 Understand the release and monitoring of wildlife

Assessment Criteria

The learner can:

1. Examine the processes involved in **wildlife release**
2. Compare wildlife **monitoring** methods

Unit content

Wildlife release

Suitability of animal for release, site of release, impact of release (on animals, humans and environment)

Equipment, identification of animals, transporting, release and handling, release methods, records

Monitoring

Identification of animal/s e.g. tattooing, micro-chips, tracking devices, monitoring and recording methods, frequency of recording and monitoring, time/season carried out when most likely to locate species, unobtrusive monitoring methods, contents of a monitoring sheet

Unit 215 Understand British Wildlife Species, Habitats and Rehabilitation

Notes for guidance

This unit is designed to provide the learner with an introduction to the understanding of British wildlife species, their habitats, threats, human intervention strategies, rehabilitation, release and monitoring.

The unit should cover a range of species appropriate to the study of British wildlife.

In Outcome 1, the learner will be required to show knowledge of British wildlife species and their habitats. It is expected that this will require some formal delivery but it should also be delivered through practical situations outside of the classroom, with visits to habitats to view wildlife and wildlife in their habitats. The learners will be expected to look at several different types of wildlife habitats from the range in the outcome content and should be able to identify the different signs of wildlife and the individual species from common signs and indicators, as well as by features of the animals themselves

Outcome 2 requires learners to demonstrate an understanding of human intervention in wildlife matters. It is anticipated that the delivery of this unit will be through formal lectures, with the use of relevant and up to date case studies. The outcome could be linked to outcome 1, in that the learners could identify main threats to the wildlife identified and the habitats they see when out on external visits and wildlife walks. They could also carry out an assessment of how human intervention could help wildlife species in the area, for example through erecting bird nesting boxes and artificial habitats for those particular species. This outcome should emphasize the importance of sustainable development.

In Outcome 3, the learner will be required to demonstrate an understanding of wildlife rehabilitation, from initial assessment of wildlife casualties to release. It is expected that this will require some formal delivery but it should also be delivered through practical situations outside of the classroom, with visits to wildlife rehabilitation centres and demonstration of equipment used. The learners could focus on one species at a wildlife rehabilitation centre and discuss all of their needs, from initial assessment when it was brought in to the centre, to when and how it was treated, rehabilitated and finally released, if applicable. The co-operation of a wildlife hospital would be extremely useful in this outcome, with them giving access to examples of hospital records, release records etc. If this was not possible, the tutor could formulate the types of records and case studies to give to the learners.

In Outcome 4, the learner will be required to demonstrate an understanding of wildlife release and monitoring techniques. It is expected that this will require formal delivery but it should also be delivered through practical situations outside of the classroom, with visits to wildlife release sites and demonstration of equipment used. Case studies can be used to show successful releases. Guest speakers from organisations such as the Wildlife Crime Unit of the Police, or rescue centre managers, would be useful to include in this outcome, as they will often bring identification equipment, monitoring records etc. to aid the learners in discovering the different release methods, types, monitoring and recording equipment.

This unit aims to develop the learners' knowledge and understanding of British wildlife and the issues currently faced by endangered British wildlife species. Emphasis should be placed on indigenous British species with use of local habitats around centres to provide real life examples

Unit 215 Understand British Wildlife Species, Habitats and Rehabilitation

Outcome 4 Understand the release and monitoring of wildlife

and allow learners to develop knowledge of their local environment.

Notes for guidance

Centres are encouraged to introduce specific employers, professionals and charitable organisations/volunteers from wildlife monitoring and rehabilitation organisations, as well as take students on visits to specific habitats, wildlife rehabilitation centres and release sites, to provide interesting and relevant information to the learner and add to the learner experience. Lessons should be a mixture of formal lessons linked directly with interactive lessons in a real environment.

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Books

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Sinclair A, Fryxell J and Caughley G. 2006. *Wildlife Ecology, Conservation, and Management.* Blackwell Publishing Professional. ISBN: 1-405-10737-5.

Journals and CD ROMs

Proceedings of Symposia of The British Wildlife Rehabilitation Council (1988, 1990 and 2000) available via BWRC website (www.bwrc.org.uk)
Wildlife Rehabilitation and Animal Welfare journal
Wildpro CD ROM '*UK Wildlife: First-aid and Care*'
Zoology journal

Websites

www.bwrc.org.uk	British Wildlife Rehabilitation Council
www.defra.gov.uk	Department for Environment, Food and Rural Affairs
www.field-studies-council.org	Field Studies
www.iwrc-online.org	International Wildlife Rehabilitation Council
www.rspca.org.uk	The Royal Society for the Prevention of Cruelty to
www.wildlifeinformation.org	Wildlife Information Network
www.wales.gov.uk	Welsh Assembly Government
www.scotland.gov.uk	Scottish Executive Environment and Rural Affairs Department
www.dardni.gov.uk	Department of agriculture and Rural Affairs

(Northern Ireland)

Unit 216 Participate in Providing Estate Maintenance

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of estate skills and how these can be applied in practice. This unit is primarily aimed at learners within a centre-based setting looking to progress into the sector or further education and training.

The aim of this unit is allow learners from a range of land-based disciplines to develop the skills and knowledge to maintain boundaries, surfaces or habitats.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Be able to select, transport and use a range of hand tools and equipment for estate maintenance
2. Be able to maintain estate boundaries
3. Be able to maintain surfaces or habitats
4. Know how to work safely and minimise environmental damage

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

CU2.2 Maintain good standards of health and safety for self and others

CU20.1 Maintain structures and surfaces

CU20.2 Repair structures and surfaces

CU22.1 Construct, maintain and repair boundaries

CU23.1 Construct, maintain and repair paths

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SCC

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge.

Unit 216 Participate in Providing Estate Maintenance

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

Assessment Criteria

The learner can:

1. Select appropriate **tools and equipment** for specific **estate maintenance tasks**
2. **Lift tools and equipment safely** using appropriate techniques
3. **Transport and use tools** and equipment **safely**
4. **Maintain and store** tools and equipment according to instructions

Unit content

Tools and equipment

Selection of appropriate tools and equipment (hammer, saw, spade, shovel, pickaxe, post driver, wire strainers, hoe, rake, fork, secateurs, shears, power tools)

Estate maintenance tasks

Constructing, maintaining and mending boundaries, structures and surfaces

Lift tools and equipment safely

Use of appropriate safe lifting techniques, in line with manual handling guidelines and Manual Handling Operations Regulations 1992, straight back, bend knees

Transport and use tools safely

Manual transport, mechanically assisted transport, security of tools

Maintain and store

Routine maintenance, (preparation, checking, adjusting, cleaning), storage, according to instructions

Unit 216 Participate in Providing Estate Maintenance

Outcome 2 Be able to maintain estate boundaries

Assessment Criteria

The learner can:

1. Assess the **condition of boundaries** to determine the maintenance requirement
2. Carry out **routine maintenance** of boundaries safely
3. Carry out **routine repairs** of boundaries safely
4. Dispose of **waste materials** in line with instructions

Range

Boundaries

Living boundaries: hedge, bank, ditch

Constructed boundaries: fence (post and rail, post and wire, electric, netting), wall (stone, brick)

Unit content

Condition of boundaries

Identified purpose, fitness for purpose, visual appearance, state of repair, health and safety implications (for people, livestock or vehicles and access)

Routine maintenance

Appropriate identified maintenance tasks, for example trimming hedges, clearing ditches, restoring banks, checking and adjusting wire tension, improving/maintaining access infrastructure (for example gaps, gates, stiles)

Routine repairs

Appropriate identified repair tasks (wood, brick or stone replacement or treatment)

Waste materials

By-products of repair or maintenance (hedge clippings, debris, litter, rotten wood)

Unit 216 Participate in Providing Estate Maintenance

Outcome 3 Be able to maintain surfaces or habitats

Assessment Criteria

The learner can:

1. Assess the condition of **surfaces** or **habitats** to determine the maintenance requirement
2. Carry out appropriate **maintenance or repairs** of surfaces or habitats

Unit content

Surfaces

Appropriate to the sector: solid (decking, concrete, paving), loose (gravel, wood chippings, sand), horse riding arena surfaces

Habitats

Appropriate to the sector: pond, woodland, heath, field margins, grassland, grazing land

Maintenance or repairs

Identified tasks: adding surface, applying a surface treatment, levelling surface, clearing or restoring a habitat, improving/maintaining access infrastructure (for example boardwalks, stone pitching, grass sward management)

Unit 216 Participate in Providing Estate Maintenance

Outcome 4 Know how to work safely and minimise environmental damage

Assessment Criteria

The learner can:

1. State the current environmental and health and safety **legislation and codes of practice**
2. Describe how to overcome **problems** presented by **services**
3. Describe how **environmental damage** can be minimised
4. Describe how **organic and inorganic waste** may be **disposed** of

Unit content

Legislation and codes of practice

Health and Safety at Work etc Act 1974, Control of Substances Hazardous to Health Regulations (2002) (COSHH), Waste Management (England and Wales) Regulations 2006 (as amended 2008)

Problems

Damage, leakage, disruption to supply, health and safety/emergency procedures, reporting to supervisor

Services

Water, electricity, gas, telephone

Environmental damage

Pollution (water courses, through litter or debris, noise), damage to habitats**,** wastage of resources Disposal of organic and inorganic waste: organic waste (recycling, composting, chipping, burning), inorganic waste (recycling, discarding safely, landfill)

Organic and inorganic waste

Organic: wood and plant products, soil, weeds, green waste, animal dung and waste

Inorganic: metal, plastics, concrete, brickwork, oils and lubricants

Disposed

Organic: composting, recycling, chipping, burning, burial

Inorganic: recycling, landfill, approved disposal contractor

Unit 216 Participate in Providing Estate Maintenance

Notes for guidance

This unit has a very practical focus and aims to enable learners to develop estate skills which can be applied to a range of situations and circumstances. The unit has been written such that naturally occurring and locally relevant opportunities can be used in selecting boundaries, structures and surfaces, to repair and maintain.

As learners will be engaged in practical activity there should be an emphasis on safe working practices, including the use of appropriate Personal Protective Equipment (PPE) and appropriate risk assessments should be undertaken. Learners should also be made aware of the impact on the environment, and sustainability concepts should also be demonstrated where possible. Where learners are using tools, they should be supervised and must be made aware of the safety of themselves and others around them.

Learners should have the opportunity to undertake estate skill activity in a setting appropriate to their area of work wherever possible to maximise the vocational relevance. It will be most beneficial if the structures, boundaries, and surface or habitat selected are for a clear purpose.

Outcome 1 is likely to be predominantly practical, as learners are required to select and safely transport and use a range of hand tools. It is not expected that learners demonstrate a practical ability for the full range shown in the unit content, but a minimum of four hand tools should be covered.

Outcomes 2 and 3 require opportunities for supervised practical experience. This may link with an appropriate work placement. It is anticipated that the tutor will guide selection of the repair or maintenance work required. It is particularly important that due regard is given to health and safety, including the use of appropriate PPE.

Outcome 4 will be largely embedded throughout delivery of the practical aspects of this unit. Learners should view working safely, with due regard to the environment as an integral feature of estate skills tasks, rather than as stand alone components.

It is anticipated that most delivery of this unit will take place in a practical setting, with supervised practice of skills. Delivery will also include some classroom based activity in ensuring learners have a good understanding of safe techniques and underpinning knowledge.

References

Books

Agate, E. 2001. *Fencing: A Practical Handbook*. Doncaster: BTCV. ISBN 094675229X. Agate, E. 1996. *Footpaths: A Practical Handbook*. Doncaster: BTCV. ISBN 0946752311. Agate, E. 2000. *Toolcare: A Maintenance and Workshop Manual*. Doncaster: BTCV. ISBN 0946752249.

Agate, E. 2001. *Tree Planting and Aftercare: A Practical Handbook*. Doncaster: BTCV. ISBN 0946752257.

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Agate, E., Brooks, A. 1998. *Hedging: A Practical Handbook*. Doncaster: BTCV. ISBN 0946752176. Agate, E., Brooks, A. 2001. *Waterways and Wetlands: A Practical Handbook*. Doncaster: BTCV. ISBN 0946752303.

Agate, E., Brooks, A., Adcock, S. 999. *Dry Stone Walling: A Practical Handbook.* Doncaster: BTCV. ISBN 0946752192.

MacLean, M. 1992. *New Hedges for the Countryside*. Ipswich: Farming Press Books and Videos. ISBN 0852362420.

Journals

Scottish Executive Rural Affairs Department — Prevention of Environmental Pollution from Agricultural Activity: Code of Good Practice Dos and Don'ts Guide

(Scottish Executive, 2002) ISBN 0755905180

Websites

www.btcv.org.uk	British Trust for Conservation Volunteers
www.defra.gov.uk	Department for Environment, Food and Rural Affairs
www.wales.gov.uk	Welsh Assembly Government
www.scotland.gov.uk	Scottish Executive Environment and Rural Affairs Department
www.dardni.gov.uk	Department of agriculture and Rural Affairs (Northern Ireland)
www.fwag.org.uk	Farm Wildlife and Advisory Group
www.hse.gov.uk	Health and Safety Executive
www.lantra.co.uk	Lantra Sector Skills Council

Unit 217 Conservation and Improvement of British Habitats

Level: 2

Credit value: 10

Unit aim

This unit aims to provide learners with an understanding of the principles of conservation and improvement of British habitats 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.

The learner will explore a range of British habitats, their characteristics and locations as well as methods use in habitat conservation, improvement and maintenance. They will learn the importance of habitat conservation through monitoring and reporting of habitat conditions, their flora and fauna and how to best enhance and protect a local habitat. They will carry out practical habitat improvements to develop their skills in the field.

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Know types of habitat found in the British Isles
2. Know factors that affect wildlife in the British Isles
3. Be able to collect and present information concerning flora and fauna
4. Be able to improve a habitat

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

CU 87.1, 2 Carry out habitat management

Endorsement of the unit by a sector or other appropriate body

This unit is endorsed by Lantra SSC.

Assessment and grading

This unit will be assessed by:

- An assignment covering practical skills and underpinning knowledge

Unit 217 Conservation and Improvement of British Habitats

Outcome 1 Know types of habitat found in the British Isles

Assessment Criteria

The learner can:

1. Identify major British **habitat types**
2. Describe major British **habitat types**
3. Outline **characteristics** of a given habitat.

Unit content

Habitat types

Upland, lowland, freshwater (ponds, lakes, reservoirs, reed beds), coastal (beaches, sand dunes, rock pools, mud-flats, buffer zones), wetland (marsh, peat bogs), grassland, heath land, meadows, woodland (ancient, deciduous, evergreen, mixed), hedgerows, rural, semi-rural, urban

Characteristics

Location, topography, climate, soil type, rainfall, temperature, flora and fauna

Unit 217 Conservation and Improvement of British Habitats

Outcome 2 Know factors that affect wildlife in the British Isles

Assessment Criteria

The learner can:

1. Describe **biotic and abiotic** factors that affect a given species of wildlife within a specified habitat
2. Outline **relationships between species** within a specified habitat

Unit content

Abiotic factors

Climate, soil, temperature, location, resources

Biotic factors

Flora and fauna, predation, grazing, competition, non-indigenous species

Relationships between species

Prey/predator relationships, parasitic relationships, food chains, competition, territorial behaviour, social behaviour

Unit 217 Conservation and Improvement of British Habitats

Outcome 3 Be able to collect and present information concerning flora and fauna

Assessment Criteria

The learner can:

1. Select and use **survey techniques** in accordance with survey specification
2. Conduct a survey of a specified local habitat, recording **flora and fauna**
3. **Present data** collected.

Unit content

Survey techniques

Quadrat and transect surveys

Flora

Individual species relevant to habitat

Fauna

Invertebrates, fish, amphibians, reptiles, mammals, birds relevant to habitat

Present data

Present information from surveys in various forms (written, data and pictorial), graphs, pie charts, basic statistics (percentages, ratios)

Unit 217 Conservation and Improvement of British Habitats

Outcome 4 Be able to improve a habitat

Assessment Criteria

The learner can:

1. Select and use appropriate **equipment**
2. Carry out **habitat improvements** safely according to site management plans
3. Carry out work in a manner which minimises **environmental damage**.

Unit content

Equipment

Basic habitat clearance: rakes, secateurs, loppers, bill hooks, and spades or other equipment appropriate to operations

Habitat improvements

Work safely; carry out site specific risk assessment, Health and Safety at Work etc Act (1974)
Conservation, re-establishment of habitats
Methods used to improve habitats for example fencing, coppicing, hedge laying, pond formation and clearance, land clearance, establishing and maintaining boundaries
Benefits of habitat improvement: flora, fauna, human communities, tourism, conservation
Clearance techniques: manual, mechanical

Environmental damage

Damage to flora by trampling, disturbance to fauna and nests, dens, sets, habitat, safe waste disposal, not leaving litter, avoiding damage by machinery and vehicles, appropriate timing of the work operations to minimise disturbance and damage

Unit 217 Conservation and Improvement of British Habitats

Notes for guidance

This unit is designed to enable the learner to explore a range of British habitats, their characteristics, locations as well as methods used in habitat conservation, improvement and maintenance. They will learn the importance of habitat conservation through monitoring and reporting of habitat conditions, their flora and fauna and how to best to enhance and protect a local habitat. They will carry out practical habitat improvements to develop their skills in the field.

This unit should consider the full range of British habitats, a representative range of flora and fauna species (plants, mammals, reptiles, insects, birds) and should aim to take advantage of the local biogeography and speciation to enable the learner to fully engage with their community's ecology.

The unit should emphasise both a National and Local perspective for habitat and their respective bio-communities allowing the learner to develop an overview of the flora and fauna of the British Isles. Inclusion of local habitats will facilitate practical delivery and will help the learner fully engage with the concepts discussed in a real environment. Safe working practices and compliance with relevant legislation, codes of practice and health and safety should be emphasised before and during practical surveying and identification.

In Outcome 1, the learner will develop their knowledge and understanding of the variety of habitats and the species that inhabit them across the British Isles. Delivery will be a combination of formal delivery and practical visits. Guest speakers or links with national and local agencies with stewardship responsibility for habitats such as the National Trust, Forestry Trust and Wildlife Trusts is encouraged.

In Outcome 2, the learner will explain a range of abiotic and biotic factors that affect wildlife and be able to develop their understanding to indicate how these factors can influence wildlife populations. Inter-relationships between flora and fauna, consumer and grazers, prey and predators, and humans should be considered. Delivery is expected to be formal but should be complimented by practical activities, videos and case studies to encourage the learner to contextualise the factors covered. Current and topical issues in British wildlife management and conservation should be highlighted.

Outcome 3 enables the learner to engage in practical identification of flora and fauna, and to expand their practical identification, surveying and reporting skills. Delivery should incorporate field opportunities within a variety of habitats to identify British flora and fauna and undertake basic surveys. The learner should aim to develop the ability to relate surveys to population studies enabling identification of trends in numbers and speciation. A range of British habitats should be available for study and emphasis should be placed on exploration of sites of local interest to engage learners.

Outcome 4 considers methods employed in and the impact of habitat improvements. Learners should be encouraged to consider short, medium and long term implications of habitat improvements with reference to flora, fauna and human populations. A combination of formal and practical delivery is envisaged. Learners should be encouraged to actively participate in habitat improvements or conservation and develop their own management plans via a local project, conservation agency or through volunteering. This will enable the development of practical conservation and habitat improvement skills, and contextualise the principles under discussion. Topical issues in British (National and Local) conservation and habitat improvement strategies should

Unit 217 Conservation and Improvement of British Habitats

be highlighted.

Outcome 4 Be able to improve a habitat

Learners working towards Level 2 may have some underpinning knowledge or have developed personal interest in aspects of this unit. It aims to build foundation knowledge of the biogeography of the British Isles and to uncover the wide variety of flora and fauna that inhabit them. Learners will be exposed to historic and current issues that have shaped habitats and their populations, and will be given the opportunity to engage in habitat improvements. Equal emphasis should be placed on the development of practical skills and the necessary knowledge to be able to identify flora and fauna. It is important that the learner understands the influence of legislation, codes of practice, health and safety and the limitations of habitat improvements in respect of management plans and local and national conservation strategies. Centres are encouraged to introduce employers and specific professional from industry to provide interesting and relevant information to the learner. Teaching would also benefit from visits to a variety of habitats to add depth to the learner experience. It is accepted that some formal lectures will be necessary at Level 2 but for this unit it is necessary to compliment this with practical opportunities and recommended to introduce interactive sessions in a real environment.

References

Books

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McGavin GC, Fletcher N, Hume R, Coombes A., Gibson C, Kibby G and Parker S. 2008. *RSPB Wildlife of Britain.* Dorling Kindersley. ISBN: 1-405-32932-7.

Collins Handbooks:

Sterry P. 2008. *Collins Complete Guide to British Wildlife: A Photographic Guide to Every Common Species*. Collins. ISBN: 0-007-23683-2.

Sterry P. 2008. *Collins Complete Guide to British Birds: A Photographic Guide to Every Common Species*. Collins. ISBN: 0-007-23686-7.

Sterry P. 2008. *Collins Complete Guide to British Wildflowers: A Photographic Guide to Every Common Species*. Collins. ISBN: 0-007-23684-0.

Sterry P. 2008. *Collins Complete Guide to British Trees: A Photographic Guide to Every Common Species*. Collins. ISBN: 0-007-23684-0.

Chinery M. 2009. *Collins Complete Guide to British Insects: A Photographic Guide to Every Common Species*. Collins. ISBN: 0-007-29899-4.

Journals

Nature
Wildlife
Forest Life
Birds
Shooting and Conservation
British Wildlife
Behavioural Ecology

Websites

www.wildlifetrust.org.uk	The Wildlife Trust
www.nationalparks.gov.uk	National Parks
www.rspb.org.uk	Royal Society for the Protection of Birds
www.wildaboutbritain.co.uk	Wild about Britain
www.woodlandtrust.com	The Woodland Trust
www.british-trees.com	The Woodland Trust

Unit 217 Conservation and Improvement of British Habitats

www.bbc.co.uk/nature British Broadcasting Corporation
www.countrysideinfo.co.uk Offwell Woodland and Wildlife Trust

www.habitat.org.uk	Habitat
www.naturescape.co.uk	Nature Escape

Unit 218 Introduction to Dairy and Beef Cattle Husbandry

Level: 2

Credit value: 10

Unit aim

Learning outcomes

There are **four** learning outcomes to this unit. The learner will:

1. Know the common production systems used in dairy and beef cattle farming
2. Know the principles of cattle management
3. Be able to carry out routine livestock husbandry on dairy and beef cattle
4. Be able to carry out routine health tasks on dairy and beef cattle

Guided learning hours

It is recommended that **60** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

Endorsement of the unit by a sector or other appropriate body

Assessment and grading

Unit 218 Introduction to Dairy and Beef Cattle Husbandry

Outcome 1 Know the common production systems used in dairy and beef cattle farming

Assessment Criteria

The learner can:

1. Describe the **production cycle** for **dairy cattle**
2. Describe the **production cycle** for **beef cattle**

Unit content

Production cycle – dairy cattle

Calf rearing, rearing of replacement heifers, lactation cycle

Production cycle – beef cattle

Suckler cows, intensive and extensive beef systems

Unit 218 Introduction to Dairy and Beef Cattle Husbandry

Outcome 2 Know the principles of cattle management

Assessment Criteria

The learner can:

1. Describe the selection of **male** and **female stock**
2. Outline **health and welfare requirements** for dairy and beef cattle
   - care of stock
   - common disorders and diseases
3. Describe the **housing requirements** of dairy and beef cattle
4. Describe the **principles of feeding** dairy and beef cattle

Unit content

Male stock

Breeding stock: reasons for culling, selection characteristics

Female stock

Beef production, selection characteristics

Health and welfare requirements

- Care of stock including animal welfare considerations
- Common disorders and diseases such as metabolic disorders, parasitic infections, contagious and notifiable diseases

Housing requirements

- Welfare considerations
- Housing types
- Disposal of waste

Principles of feeding

Methods of feeding and providing water, feed types, select feeding equipment, prepare food for animals, feed animals, provide water to animals, monitor feeding and drinking of animals, clean feeding equipment, grazing management, seasonal factors

Unit 218 Introduction to Dairy and Beef Cattle Husbandry

Outcome 3 Be able to carry out routine livestock husbandry on dairy and beef cattle

Assessment Criteria

The learner can:

1. Carry out **routine husbandry** of dairy and beef cattle safely
    - feeding
    - cleaning
    - record keeping
    - movement of animals
2. Assist in the **operation of a grazing system** to meet given objectives
3. Assist in **activities to milk cows** to meet given objectives

Unit content

Operation of a grazing system

Operate livestock grazing systems for dairy cows and beef cattle

Activities to milk cows

- Clean milk production
- Hygiene and legislation

Unit 218 Introduction to Dairy and Beef Cattle Husbandry

Outcome 4 Be able to carry out routine health tasks on dairy and beef cattle

Assessment Criteria

The learner can:

1. Carry out **health checks** on dairy and beef cattle
2. Carry out **routine treatments** to maintain health and wellbeing of dairy and beef cattle

Unit content

Health checks

Assess physical condition and behaviour of livestock, signs of health and ill health in different farm livestock (temperature and respiration, alertness, posture, movement, coat condition, feeding, faeces condition)

Routine treatments

Routine stock tasks, for example handling, haltering, disbudding, castration, dosing, injecting, applying surface treatments, temperature taking, feet trimming, ear marking, weighing, selection for slaughter

Unit 219 Introduction to Sheep Husbandry

Level: 2

Credit value: 5

Unit aim

Learning outcomes

There are **three** learning outcomes to this unit. The learner will:

1. Know the common production systems used in sheep farming
2. Know the principles of sheep management
3. Be able to carry out routine animal husbandry and health tasks on sheep

Guided learning hours

It is recommended that **30** hours should be allocated for this unit. This may be on a full-time or part-time basis.

Details of the relationship between the unit and relevant national occupational standards

Endorsement of the unit by a sector or other appropriate body

Assessment and grading

Unit 219 Introduction to Sheep Husbandry

Outcome 1 Know the common production systems used in sheep farming

Assessment Criteria

The learner can:

1. Describe the **production cycle** for a given lowland sheep flock
   - lambing
   - targets and timing
2. Outline the use of local breeds and breed crosses for common production systems

Unit content

Production cycle

- Productivity of the main production systems
- Lambing seasons and target markets
- Costing production and price trends

Unit 219 Introduction to Sheep Husbandry

Outcome 2 Know the principles of sheep management

Assessment Criteria

The learner can:

1. Outline breed of sheep
   - **selection**
   - signs of **oestrus**
   - care of **animals after mating**
   - **care of newborn lambs**
2. Describe **health and welfare requirements** of sheep
   - **housing**
   - **common disorders and diseases**
3. Describe the **key nutritional requirements** of sheep

Unit content

Selection

Choice of breeds, selection of male and female breeding stock, reasons for culling

Oestrus

Sheep breeding cycle

Animals after mating

- Care of in-lamb ewes: health checks, condition scoring, nutritional requirements, welfare considerations
- Preparation for lambing

Care of the new born lamb

Health checks, medicines, feeding, nutritional requirements, welfare considerations, fostering

Health and welfare requirements

Care of stock including animal welfare considerations

Housing

Housing types

Common disorders and diseases

Including metabolic disorders, parasitic infections, contagious and notifiable diseases

Key nutritional requirements

Meeting nutritional requirements pre tupping, during mating, early pregnancy, prior to lambing and early lactation, and at grass

Unit 219 Introduction to Sheep Husbandry

Outcome 3 Be able to carry out routine animal husbandry and health tasks on sheep

Assessment Criteria

The learner can:

1. Carry out **routine husbandry of sheep** safely
2. Assist at **lambing** to meet given objectives
3. Carry out **routine treatments** to maintain the health and wellbeing of sheep

Unit content

Routine husbandry of sheep

- Feeding
- Cleaning
- Health checks
- Record keeping
- Movement of animals

Lambing

Signs of lambing, assisting at lambing, navel treatments, records

Routine treatments

Routine stock tasks, for example catching, handling, turning, ageing, castration, detailing, dagging, dosing, injecting, applying surface treatments, feet trimming, ear marking, weighing, selection for slaughter

Appendix 1 Relationships to other qualifications

Literacy, language, numeracy and ICT skills development

These qualifications include opportunities to develop and practise many of the skills and techniques required for success in the following qualifications:

- Functional Skills (England) – see **www.cityandguilds.com/functionalskills**
- Essential Skills (Northern Ireland) – see **www.cityandguilds.com/essentialskillsni**
- Essential Skills Wales – see **www.cityandguilds.com/esw**

There might also be opportunities to develop skills and/or portfolio evidence if learners are completing any Key Skills alongside these qualifications.

Unit 219 Introduction to Sheep Husbandry

Appendix 2 Sources of general information

The following documents contain essential information for centres delivering City & Guilds qualifications. They should be referred to in conjunction with this handbook. To download the documents and to find other useful documents, go to the **Centres and Training Providers homepage** on **www.cityandguilds.com**.

Providing City & Guilds qualifications – a guide to centre and qualification approval contains detailed information about the processes which must be followed and requirements which must be met for a centre to achieve 'approved centre' status, or to offer a particular qualification. Specifically, the document includes sections on:

- The centre and qualification approval process and forms
- Assessment, verification and examination roles at the centre
- Registration and certification of learners
- Non-compliance
- Complaints and appeals
- Equal opportunities
- Data protection
- Frequently asked questions.

Ensuring quality contains updates and good practice exemplars for City & Guilds assessment and policy issues. Specifically, the document contains information on:

- Management systems
- Maintaining records
- Assessment
- Internal verification and quality assurance
- External verification.

Access to Assessment & Qualifications provides full details of the arrangements that may be made to facilitate access to assessments and qualifications for learners who are eligible for adjustments in assessment.

The **centre homepage** section of the City & Guilds website also contains useful information such as:

- ***Walled Garden***
  Find out how to register and certificate learners online
- ***Events***
  Contains dates and information on the latest Centre events

Useful contacts

Type	Contact	Query
UK learners	T: +44 (0)844 543 0033 E: learnersupport@cityandguilds.com	• General qualification information
Centres	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413 E: centresupport@cityandguilds.com	• Exam entries • Registrations/enrolment • Certificates • Invoices • Missing or late exam materials • Nominal roll reports • Results
Walled Garden	T: +44 (0)844 543 0000 F: +44 (0)20 7294 2413 E: walledgarden@cityandguilds.com	• Re-issue of password or username • Technical problems • Entries • Results • GOLA • Navigation • User/menu option problems
Employer	T: +44 (0)121 503 8993 E: business@cityandguilds.com	• Employer solutions • Mapping • Accreditation • Development Skills • Consultancy

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