

# ENVIRONMENTAL AND LAND-BASED STUDIES





# Environmental and Land-based Studies

## Level 3 Principal Learning

**Specification (7363)**  
**Assessment 2010 onwards**

This Principal Learning specification should be read in conjunction with:

- Diploma in Environmental and Land-based Studies: Companion Document for Principal Learning (see [www.diplomaelbs.co.uk](http://www.diplomaelbs.co.uk))
- Specimen assessment materials and mark schemes for Principal Learning
- Teacher guidance materials for Principal Learning
- Examiners' Reports for Principal Learning
- Specifications for other components of Diplomas ie Functional Skills specifications, Project specifications and Additional and Specialist Learning specifications

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AQA Logistics Centre Unit 2, Wheel Forge Way, Ashburton Park, Trafford Park, Manchester M17 1EH  
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# Contents

## 1 Introduction

1.1	Why choose AQA-City & Guilds?	5
1.2	Why choose the Diploma in Environmental and Land-based Studies?	6
1.3	How do I start using this specification?	6
1.4	How do I find out more?	7

## 2 Specification at a glance

2.1	Advanced Diploma at a glance	8
2.2	Level 3 Principal Learning in Environmental and Land-based Studies at a glance	9

## 3 Principal Learning

3.1	Personal, Learning and Thinking Skills	10
3.2	Functional Skills signposting	13
3.3	Sector-related industries	15
3.4	Level 3 Units	16
	Level 3 Unit 1: The ecology of the natural environment and the importance of biodiversity	16
	Level 3 Unit 2: The management of natural resources and successful production systems	28
	Level 3 Unit 3: Business management and careers in the Environmental and Land-based sector	38
	Level 3 Unit 4: Plants and animals: applied science	50
	Level 3 Unit 5: Plants, animals and humans: how they relate	61
	Level 3 Unit 6: Plants and animals: safe working practices and relevant legislation	71
	Level 3 Unit 7: Sustainable management and development of resources	80
	Level 3 Unit 8: Global impacts and the Environmental and Land-based sector	88
	Level 3 Unit 9: Research methodology, evaluation and environmental analysis	101

## 4 Assessment guidance

4.1	Task setting	114
	Guidance	114
	Moderation	114
4.2	Task taking	114
	Internal assessment	114
	Supervision of learners' work	116
	Guidance by the teacher	116
	External assessment	116

4.3	Task marking	116
	Guidance on applying the unit Assessment grid	116
	Assessment of group work	117
	Internal standardisation of marking	117
	Claiming and moderation of internal assessment	117
	Unfair practice	117
	Authentication of learners' work	117
	Malpractice	118
	Moderation	118

## 5 Administration

5.1	Availability of Principal Learning units	119
5.2	Centre registration	119
5.3	Centre requirements	119
	Resources	119
	Health and safety	119
	Centre staff	119
	Continuing Professional Development (CPD)	119
5.4	Entries	120
5.5	Quality assurance	120
	Internal quality assurance	120
	External quality assurance	121
5.6	Irregularities	121
5.7	Awarding grades and reporting results	121
5.8	Certification of the Diploma	122
5.9	CABs, DABs and the Diploma aggregation service	122
5.10	Enquiries about results	122
5.11	Re-sits and shelf-life of unit results	122
5.12	Access arrangements and special consideration	123
5.13	Language of examinations	123
5.14	Qualification titles	123

## Appendices

A	Connections to other qualifications	124
B	Additional and Specialist Learning for the Advanced Diploma in Environmental and Land-based Studies	125
C	Other issues	126

# 1 Introduction

## 1.1 Why choose AQA-City & Guilds?

AQA is the UK's main provider of GCSEs and A levels. Over 3.5 million AQA examinations are taken every year and AQA is recognised by schools and colleges as the number one choice for customer service and high quality products.

City & Guilds is a household name for vocational qualifications. City & Guilds offers over 500 awards across a range of industries. With over 8500 centres in over 100 countries, City & Guilds is recognised by employers worldwide. It works closely with employers and industry bodies to ensure that its qualifications provide the benchmark standard for workplace skills and knowledge.

Diplomas are a blend of academic and vocational learning and that is why AQA-City & Guilds is the ideal choice for any school, college or consortium looking to offer them. The collaboration brings together the leading providers of qualifications in both fields to provide all the support you need to deliver the Diploma at one point of contact.

## Why are AQA and City & Guilds so popular?

- **Specifications**

These are designed to the highest standards, so that teachers, learners and learners' parents or guardians can be confident that an AQA-City & Guilds award provides an accurate measure of achievement. Assessment structures have been designed to achieve a balance between rigour, reliability and demands on learners and teachers.

- **Support**

AQA-City & Guilds runs the most extensive programme of Diploma support meetings available in the UK; these are free of charge in the first years of a new specification and are offered at a very reasonable cost thereafter. These meetings explain the specification and suggest practical teaching strategies and approaches that really work. Further support is available from Diploma Advisors.

- **Service**

AQA-City & Guilds Diplomas are administered from AQA's offices in Manchester and Guildford. We are committed to providing an efficient and effective service and we are at the end of a phone when you need information, advice or guidance. We will try to resolve issues the first time you contact us and will work with you to find the solution.

- **Ethics**

AQA and City & Guilds are registered charities. We have no shareholders to pay. We exist solely for the good of education. Any surplus income is ploughed back into educational research and our service to you, our customers. We don't profit from education, you do.

If you are an existing customer with either AQA or City & Guilds, we thank you for your support. If you are thinking of adopting AQA-City & Guilds for Diplomas, we look forward to welcoming you.

## 1.2 Why choose the Diploma in Environmental and Land-based Studies?

The Diploma in Environmental and Land-based Studies provides an innovative and contemporary programme of study which introduces learners to the wide range of opportunities in this sector. It combines knowledge, understanding and skills that are valued by industry and the world of work and it can be delivered successfully in both urban and rural locations.

The Diploma will enable learners to progress into Further and Higher Education and future employment. Learners following a Diploma in Environmental and Land-based Studies will also:

- develop Functional Skills in English, mathematics and ICT
- produce a project which complements the Principal Learning and/or supports progression
- have a wide choice of Additional and Specialist Learning from which they can choose other qualifications which reflect their interests and abilities.

## 1.3 How do I start using this specification?

- Your school or college must pass through the Government Gateway process in order to receive approval to offer Diplomas in Environmental and Land-based Studies. Gateway 1 approved consortia started teaching Diplomas in 2008, Gateway 2 approved consortia start teaching Diplomas in 2009, and Gateway 3 is approving consortia to start teaching in 2010. More information is available on the DCSF website:  
**[www.dcsf.gov.uk](http://www.dcsf.gov.uk)**
- If you are a Gateway approved centre working as part of a consortium delivering Diplomas, you will also need to register your centre with us. (See Section 5.2.) This will enable AQA to ensure that you receive all the material you need to help you to deliver units and to enter your learners for examinations. This is particularly important where examination material is issued before the entry deadline. You can let us know by completing the appropriate registration forms. We will send copies to your exams officer and they are also available on the AQA website:  
**[www.aqa.org.uk/admin/p\\_entries.html](http://www.aqa.org.uk/admin/p_entries.html)**
- Almost all examination centres in England and Wales are approved by either AQA or City & Guilds or both. A small minority are not. If your centre is new to both AQA and City & Guilds, please contact our centre approval section at:  
**[centreapproval@aqa.org.uk](mailto:centreapproval@aqa.org.uk)**

## 1.4 How do I find out more?

### Use Ask AQA – our online information service

Centres offering AQA-City & Guilds Diplomas will have 24-hour access to answers to the most commonly-asked questions at:

**[www.aqa.org.uk/rn/askaqa.php](http://www.aqa.org.uk/rn/askaqa.php)**

If the answer to your question is not available you can submit a query for our team. Our target response time is two days.

### Contact your Diploma Advisor

You may also contact the Diploma Advisor for your region. Please check current details on:

**[www.diplomainfo.org.uk](http://www.diplomainfo.org.uk)**

Diploma Advisors have particular expertise in:

- supporting centres and consortia on Gateway applications
- curriculum development and delivery including consortium operation
- assessment and quality assurance
- dealing with work experience.

### Attend a Teacher Support meeting

Details of the full range of current Teacher Support meetings are also available on our website. There is a link to our fast and convenient online booking system for Teacher Support meetings at:

**[events.aqa.org.uk/ebooking/](http://events.aqa.org.uk/ebooking/)**

If you need to contact the Teacher Support team you can call us on 01483 477860 or email us at:

**[teachersupport@aqa.org.uk](mailto:teachersupport@aqa.org.uk)**

### Contact the Exams Office Support department

Our Exams Office Support department offers administrative support for the Diplomas. There is an office team to deal with your queries about:

- general administration
- general documents
- results documents
- timetable information
- publication orders.

You can contact us on 0870 410 1836 or email: **[eos@aqa.org.uk](mailto:eos@aqa.org.uk)**

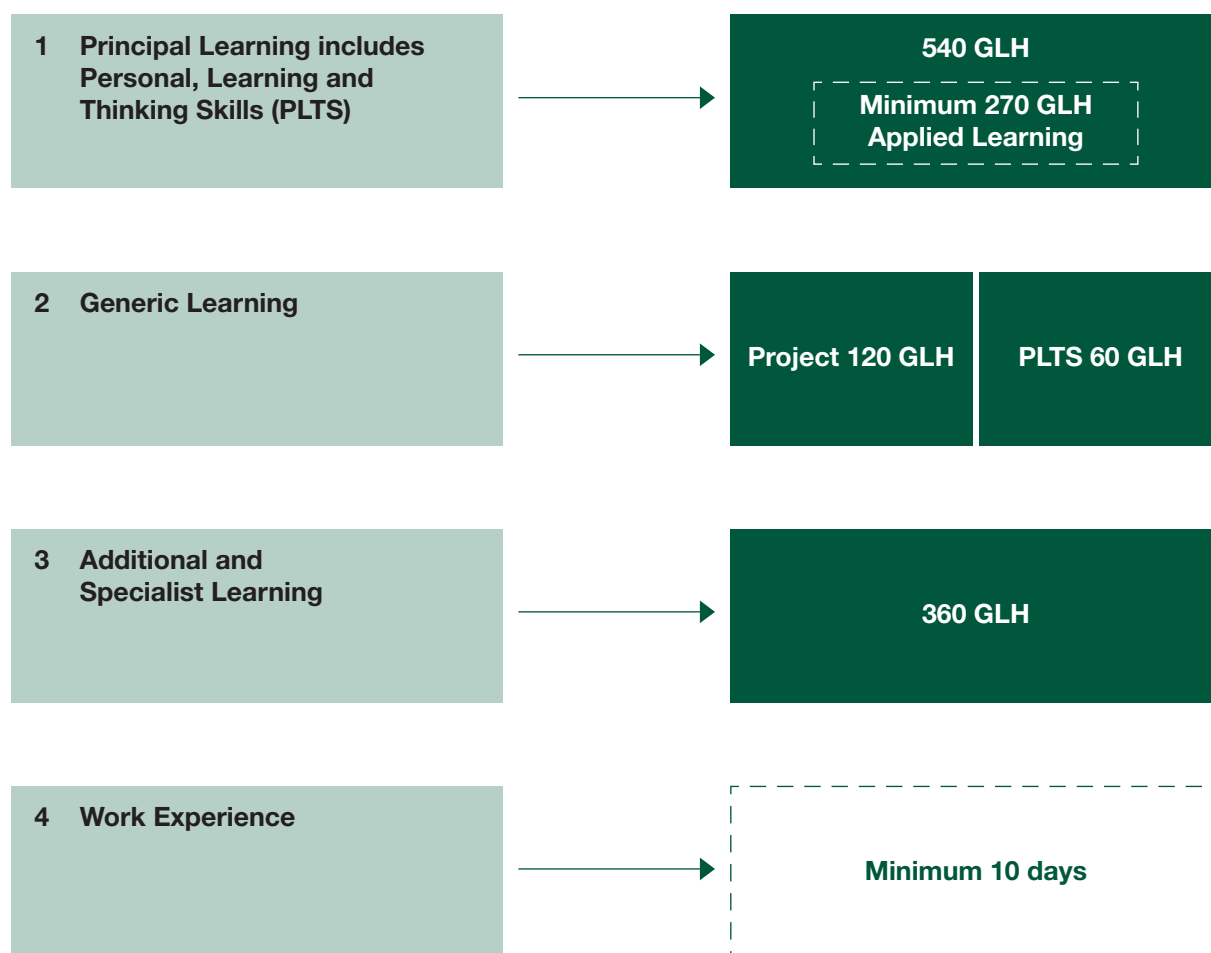
The department includes AQA's five Regional Officers who can provide up-to-date information, advice, support and guidance at a local level in your region. To contact the Regional Officer for your area, see:

**[www.aqa.org.uk/regional\\_officer.php](http://www.aqa.org.uk/regional_officer.php)**

## 2 Specification at a glance

### 2.1 Advanced Diploma at a glance – 1080 GLH (guided learning hours)

- comparable to 3.5 GCE A Levels
- 2 years full-time study
- all components are compulsory
- Progression Qualification available – consists of Principal Learning and Generic Learning only – ie no additional or specialist learning



## 2.2 Level 3 Principal Learning in Environmental and Land-based Studies at a glance

- all 9 units are compulsory

### Unit 1 30 GLH

**The ecology of the natural environment and the importance of biodiversity**  
Internally assessed

### Unit 2 60 GLH

**The management of natural resources and successful production systems**  
Internally assessed

### Unit 3 90 GLH

**Business management and careers in the Environmental and Land-based sector**  
Internally assessed

### Unit 4 60 GLH

**Plants and animals: applied science**  
Internally assessed

### Unit 5 60 GLH

**Plants, animals and humans: how they relate**  
Internally assessed

### Unit 6 60 GLH

**Plants and animals: safe working practices and relevant legislation**  
Externally assessed

### Unit 7 60 GLH

**Sustainable management and development of resources**  
Externally assessed

### Unit 8 60 GLH

**Global impacts and the Environmental and Land-based sector**  
Internally assessed

### Unit 9 60 GLH

**Research methodology, evaluation and environmental analysis**  
Internally assessed

## 3 Principal Learning

### 3.1 Personal, Learning and Thinking Skills

The Framework of Personal, Learning and Thinking Skills 11–19 comprises six groups of skills that, together with the Functional Skills of English, mathematics and ICT, are essential to success in learning, life and work. For each group there is a focus statement that identifies the main PLTS in that group. This is followed by a set of outcome statements that are indicative of behaviours and personal qualities associated with each group of skills.

Each group of skills is distinctive and coherent. The groups are also inter-connected. Learners are likely to encounter skills from several groups in any one learning experience.

Listed below are the PLTS that are integrated within the Assessment criteria in each unit. A copy of the PLTS framework should be given to each learner. Following these descriptors is a table showing the PLTS in the nine units of the Level 3 Principal Learning in Environmental and Land-based Studies.

#### Independent enquirers

Focus:

Young people process and evaluate information in their investigations, planning what to do and how to go about it. They take informed and well-reasoned decisions, recognising that others have different beliefs and attitudes.

Young people:

IE1 identify questions to answer and problems to resolve

IE2 plan and carry out research, appreciating the consequences of decisions

IE3 explore issues, events or problems from different perspectives

IE4 analyse and evaluate information, judging its relevance and value

IE5 consider the influence of circumstances, beliefs and feelings on decisions and events

IE6 support conclusions, using reasoned arguments and evidence

#### Creative thinkers

Focus:

Young people think creatively by generating and exploring ideas, making original connections. They try different ways to tackle a problem, working with others to find imaginative solutions and outcomes that are of value.

Young people:

CT1 generate ideas and explore possibilities

CT2 ask questions to extend their thinking

CT3 connect own and others' ideas and experiences in inventive ways

CT4 question own and others' assumptions

CT5 try out alternatives or new solutions and follow ideas through

CT6 adapt ideas as circumstances change

## Reflective learners

### Focus:

Young people evaluate their strengths and limitations, setting themselves realistic goals with criteria for success. They monitor their own performance and progress, inviting feedback from others and making changes to further their learning.

### Young people:

RL1 assess themselves and others, identifying opportunities and achievements

RL2 set goals with success criteria for their development and work

RL3 review progress, acting on the outcomes

RL4 invite feedback and deal positively with praise, setbacks and criticism

RL5 evaluate experiences and learning to inform future progress

RL6 communicate their learning in relevant ways for different audiences

## Team workers

### Focus:

Young people work confidently with others, adapting to different contexts and taking responsibility for their own part. They listen to and take account of different views. They form trusting relationships, resolving issues to reach agreed outcomes.

### Young people:

TW1 co-operate with others to work towards common goals

TW2 reach agreements, managing discussions to achieve results

TW3 adapt behaviour to suit different roles and situations

TW4 show fairness and consideration to others

TW5 take responsibility, showing confidence in themselves and their contribution

TW6 provide constructive support and feedback to others

## Self-managers

### Focus:

Young people organise themselves, showing personal responsibility, initiative, creativity and enterprise with a commitment to learning and self-improvement. They actively embrace change, responding positively to new priorities, coping with challenges and looking for opportunities.

### Young people:

SM1 seek out challenges or new responsibilities and show flexibility when priorities change

SM2 work towards goals, showing initiative, commitment and perseverance

SM3 organise time and resources, prioritising actions

SM4 anticipate, take and manage risks

SM5 deal with competing pressures, including personal and work-related demands

SM6 respond positively to change, seeking advice and support when needed

SM7 manage their emotions, and build and maintain relationships

## Effective participators

### Focus:

Young people actively engage with issues that affect them and those around them. They play a full part in the life of their school, college, workplace or wider community by taking responsible action to bring improvements for others as well as themselves.

### Young people:

EP1 discuss issues of concern, seeking resolution where needed

EP2 present a persuasive case for action

EP3 propose practical ways forward, breaking these down into manageable steps

EP4 identify improvements that would benefit others as well as themselves

EP5 try to influence others, negotiating and balancing diverse views to reach workable solutions

EP6 act as an advocate for views and beliefs that may differ from their own

This table shows the coverage of PLTS in the Principal Learning units of the Advanced Diploma in Environmental and Land-based Studies.

## Level 3 Principal Learning in Environmental and Land-based Studies

PLTS	IE	CT	RL	TW	SM	EP
Unit 1	★	★		★		
Unit 2			★	★		
Unit 3	★	★	★	★		★
Unit 4	★					★
Unit 5		★		★		
Unit 6			★			★
Unit 7	★	★				★
Unit 8		★				★
Unit 9	★			★	★	

## 3.2 Functional Skills signposting

The units may use and/or contribute towards the underpinning skills and knowledge of the Functional Skills in the following areas, depending on the precise nature of the work done in the Principal Learning. If work is generated by computer then the Functional Skill marked\* will be used.

Principal Learning	Functional Skills		
Unit	English	Mathematics	Information and communication technology
Unit 1 The ecology of the natural environment and the importance of biodiversity	<ul style="list-style-type: none"> <li>• Speaking and listening Level 2</li> <li>• Reading Level 2</li> <li>• Writing Level 2</li> </ul>	<ul style="list-style-type: none"> <li>• Representing situations using mathematics Level 2</li> <li>• Analysing and processing using mathematics Level 2</li> <li>• Interpreting and presenting results Level 2</li> </ul>	<ul style="list-style-type: none"> <li>• Use ICT systems Level 2</li> <li>• Find and select information Level 2</li> <li>• Develop, present and communicate information Level 2*</li> </ul>
Unit 2 The management of natural resources and successful production systems	<ul style="list-style-type: none"> <li>• Speaking and listening Level 2</li> <li>• Reading Level 2</li> <li>• Writing Level 2</li> </ul>	<ul style="list-style-type: none"> <li>• Representing situations using mathematics Level 2</li> <li>• Analysing and processing using mathematics Level 2</li> <li>• Interpreting and presenting results Level 2</li> </ul>	<ul style="list-style-type: none"> <li>• Use ICT systems Level 2</li> <li>• Find and select information Level 2</li> <li>• Develop, present and communicate information Level 2*</li> </ul>
Unit 3 Business management and careers in the Environmental and Land-based sector	<ul style="list-style-type: none"> <li>• Speaking and listening Level 2</li> <li>• Reading Level 2</li> <li>• Writing Level 2</li> </ul>	<ul style="list-style-type: none"> <li>• Representing situations using mathematics Level 2</li> <li>• Analysing and processing using mathematics Level 2</li> <li>• Interpreting and presenting results Level 2</li> </ul>	<ul style="list-style-type: none"> <li>• Use ICT systems Level 2</li> <li>• Find and select information Level 2</li> <li>• Develop, present and communicate information Level 2*</li> </ul>
Unit 4 Plants and animals: applied science	<ul style="list-style-type: none"> <li>• Speaking and listening Level 2</li> <li>• Reading Level 2</li> <li>• Writing Level 2</li> </ul>	<ul style="list-style-type: none"> <li>• Representing situations using mathematics Level 2</li> <li>• Analysing and processing using mathematics Level 2</li> <li>• Interpreting and presenting results Level 2</li> </ul>	<ul style="list-style-type: none"> <li>• Use ICT systems Level 2</li> <li>• Find and select information Level 2</li> <li>• Develop, present and communicate information Level 2*</li> </ul>

Principal Learning		Functional Skills		
Unit	English	Mathematics	Information and communication technology	
Unit 5 Plants, animals and humans: how they relate	<ul style="list-style-type: none"> <li>• Speaking and listening Level 2</li> <li>• Reading Level 2</li> <li>• Writing Level 2</li> </ul>	<ul style="list-style-type: none"> <li>• Representing situations using mathematics Level 2</li> <li>• Analysing and processing using mathematics Level 2</li> <li>• Interpreting and presenting results Level 2</li> </ul>	<ul style="list-style-type: none"> <li>• Use ICT systems Level 2</li> <li>• Find and select information Level 2</li> <li>• Develop, present and communicate information Level 2*</li> </ul>	
Unit 6 Plants and animals: safe working practices and relevant legislation	<ul style="list-style-type: none"> <li>• Speaking and listening Level 2</li> <li>• Reading Level 2</li> <li>• Writing Level 2</li> </ul>	<ul style="list-style-type: none"> <li>• Representing situations using mathematics Level 2</li> <li>• Analysing and processing using mathematics Level 2</li> <li>• Interpreting and presenting results Level 2</li> </ul>	<ul style="list-style-type: none"> <li>• Use ICT systems Level 2</li> <li>• Find and select information Level 2</li> <li>• Develop, present and communicate information Level 2*</li> </ul>	
Unit 7 Sustainable management and development of resources	<ul style="list-style-type: none"> <li>• Speaking and listening Level 2</li> <li>• Reading Level 2</li> <li>• Writing Level 2</li> </ul>	<ul style="list-style-type: none"> <li>• Representing situations using mathematics Level 2</li> <li>• Analysing and processing using mathematics Level 2</li> <li>• Interpreting and presenting results Level 2</li> </ul>	<ul style="list-style-type: none"> <li>• Use ICT systems Level 2</li> <li>• Find and select information Level 2</li> <li>• Develop, present and communicate information Level 2</li> </ul>	
Unit 8 Global impacts and the Environmental and Land-based sector	<ul style="list-style-type: none"> <li>• Speaking and listening Level 2</li> <li>• Reading Level 2</li> <li>• Writing Level 2</li> </ul>	<ul style="list-style-type: none"> <li>• Representing situations using mathematics Level 2</li> <li>• Analysing and processing using mathematics Level 2</li> <li>• Interpreting and presenting results Level 2</li> </ul>	<ul style="list-style-type: none"> <li>• Use ICT systems Level 2</li> <li>• Find and select information Level 2</li> <li>• Develop, present and communicate information Level 2*</li> </ul>	
Unit 9 Research methodology, evaluation and environmental analysis	<ul style="list-style-type: none"> <li>• Speaking and listening Level 2</li> <li>• Reading Level 2</li> <li>• Writing Level 2</li> </ul>	<ul style="list-style-type: none"> <li>• Representing situations using mathematics Level 2</li> <li>• Analysing and processing using mathematics Level 2</li> <li>• Interpreting and presenting results Level 2</li> </ul>	<ul style="list-style-type: none"> <li>• Use ICT systems Level 2</li> <li>• Find and select information Level 2</li> <li>• Develop, present and communicate information Level 2</li> </ul>	

### 3.3 Sector-related industries

It is important that learners receive as broad an experience of the Environmental and Land-based sector as possible. The sector covers three broad clusters of industry:

- 1 Land management and production
- 2 Animal health and welfare
- 3 Environmental industries.

Teachers are urged to refer to, and use examples from, the following seventeen industries where appropriate and relevant:

- agricultural crops
- agricultural livestock
- aquaculture
- fencing
- floristry
- land-based engineering
- production horticulture
- trees and timber
- animal care
- animal technology
- equine
- farriery
- veterinary nursing
- environmental conservation
- fisheries management
- game and wildlife management
- landscape.

However, learners must be aware that all industries use and are influenced by the environment, whether they are directly involved in the Environmental and Land-based sector or not. Teachers should refer to, and use examples from, related industries outside the sector where appropriate and relevant.

## 3.4 Level 3 Units

# Level 3 Unit 1: The ecology of the natural environment and the importance of biodiversity

## What is this unit about?

Individuals, professional organisations and enterprises, living or working in the environment, aim to be effective and to minimise unnecessary and unwanted side-effects on the natural world. They usually base their activities on a set of developing scientific principles that express our current understanding of how the natural world operates and how it responds to a diverse range of influences.

Developing a full and accurate understanding of an environment is a major and complex undertaking, but some fundamental principles are becoming better understood as our knowledge of the natural processes underpinning them expands and deepens. These principles enable us to develop an increasingly sophisticated explanation of the ways in which living organisms interrelate and how they influence each other and the environment in which they exist.

The widespread significance of many of these ecological principles means that the decisions being taken on a daily basis by a forestry enterprise, for example, are similar to those faced by professionals working in a national park, a market garden or a fish farm. All have to understand the interdependence of the plants and animals in their area and how they will be affected by human actions.

In this unit, learners are introduced to some of the more advanced principles in ecology. The unit includes how the associations between the living and non-living components of an environment affect development and how particular resources critical to maintaining life are affected by the activities of humans, other plants and animals. The unit explores how the physical environment and competition influence the ways that plants and animals interact and how habitats and ecosystems develop in managed and natural situations.

There will be opportunities to review the distribution and characteristics of habitats and to assess the importance of biodiversity to maintaining a healthy, resilient and balanced environment.

This unit has particular emphasis for the following Personal, Learning and Thinking Skills (PLTS):

- independent enquirers
- creative thinkers
- team workers.

## Guided learning hours

This unit has 30 GLH assigned to it, of which 6 hours will be needed for the assessment. Details of specific controls needed in relation to the internal assessment are shown in the Assessment section of this unit. Overall information on controls is on pages 114–118 of this specification.

## Content details

<b>Learning outcomes</b> The learner will:	<b>Assessment criteria</b> The learner can:	<b>PLTS</b>
1 Understand the principles of ecology and ecosystems	a explain the concept of ecology	
	b explain how animal and plant communities develop and interact	
	c interpret the interrelationship between the abiotic and biotic elements and energy flow within an ecosystem	
2 Understand the importance of biodiversity	a explain the importance of biodiversity in ecosystems	
	b explain the effects of natural and managed influences on soil, water and biodiversity in an environment	
	c explain how animal and plant characteristics fit and are influenced by environmental conditions	
3 Know the principles of surveying techniques used to analyse habitats	a outline the range of scientific techniques used to survey habitats	
	b describe how data can be used to influence the use of a habitat by an Environmental and Land-based enterprise	
4 Be able to assess the viability of a habitat for different uses	a use a range of scientific techniques, with colleagues, to survey ecological characteristics of a habitat	TW1
	b analyse data to identify the ecology of a habitat	IE4
	c generate ideas for the use of a habitat by an Environmental and Land-based enterprise	CT1
	d draw conclusions, using reasoned arguments, on the use of habitat by an Environmental and Land-based enterprise	IE6

Where the Assessment criteria show a direct link to an area of the PLTS framework, it is referenced here. Further information on PLTS is available on pages 10–12 of the specification and also within this unit in the section on Personal, Learning and Thinking Skills.

3

## Scope of content

This section gives details of the scope of content to be covered in the teaching of this unit, to ensure that all the Learning outcomes can be met. This includes examples relating to breadth and depth where applicable.

It is important that, through the Level 3 Principal Learning in Environmental and Land-based Studies, learners receive as broad an experience of the whole sector as possible. Teachers are urged to refer to, and use examples from, appropriate industries where relevant. Details of these industries may be found on page 15 of the specification.

### Learning outcome 1

Learners must be taught a high-level appreciation of what is meant by ecology and the principles that currently underpin our understanding of it. They must be aware of the meanings and significance of terms such as ecosystem, habitat, micro-habitat, biotic and abiotic factors, niche, population, community, food chains, food webs, interspecific and intraspecific competition and succession, as applied to a relatively complex set habitat. Learners must also be taught the characteristics of the different types of habitat within the UK and be able to associate the habitat's characteristics and prevailing conditions to the types of living organisms found within them.

Teachers must allow learners to consider communities of plants and animals in terms of how these communities develop, currently exist and may be expected to respond to factors affecting them. In addition, learners must be able to consider how living organisms relate to the abiotic components in their environment, how these associations are balanced and how the biotic and abiotic elements can be affected by environmental influences and changes. Teachers must provide learners with an understanding of how these associations are built on the critical flows of energy through the biotic components of an environment.

### Learning outcome 2

Teachers must provide learners with an understanding of why the biodiversity status of an ecosystem is important and explain the ecological significance and implications of areas with high and low biodiversity. In addition, learners must consider how changes to abiotic features such as water, air and some soil components might affect the diversity of the biotic component of an area.

The positive and negative ways in which natural actions and the activities of local Environmental and Land-based organisations impact on an area's abiotic components and its biodiversity standing must also be considered.

Learners must be taught about the relationship between form and function in the animal and plant communities in an area, and how their characteristics enable the organisms to be part of the ecosystem. The implication for these organisms of significant natural and man-made changes to an area must be explored.

### Learning outcome 3

Teachers must ensure that learners are aware of how Environmental and Land-based enterprises and organisations analyse habitats for which they are responsible. Learners must be taught the principles upon which analytical techniques are based, how the techniques are selected and matched to the information required and how the data collected by the techniques enables the organisations to make analyses and decisions (it should be noted that research techniques are covered, in detail, in Level 3 Unit 9: Research methodology, evaluation and environmental analysis, and it may be advantageous to link the units for learning and assessment purposes). Teachers must ensure that learners are aware that decisions on habitat use are rarely made on scientific analysis alone, but that considerations such as cost-benefit and risk assessments often contribute to decisions.

The limitations of common techniques and the consequences of measurement and sampling errors must be covered. Common techniques would normally include quadrats, transects, animal traps, soil tests and water tests. Teachers must show learners how the results of the techniques used in an analysis enable them to gain data, how to analyse and evaluate this data, and how to use it to propose appropriate future uses of the habitat.

## **Learning outcome 4**

Learners must be taught to use a range of common scientific techniques to assess the ecological characteristics of an area. There are advantages for the learner if the investigation is based on an authentic issue faced by Environmental and Land-based organisations.

Learners are to be shown how to select and apply appropriate techniques effectively, so that they generate meaningful and accurate scientific data and can use the information to create reasoned and substantiated proposals for the use of the habitat. They should be able to link their proposals to the evidence base with an indication of the levels of confidence they carry. Learners must be made aware of the health and safety issues involved in all aspects of investigative work and are required to use safe working practices at all times.

## Assessment

This unit is assessed through a centre set and marked assignment. Internal assessments are subject to moderation by AQA-City & Guilds.

The learner will complete an assignment which will be based upon a comparison of habitats and/or ecosystems, one of which will be investigated in detail through the use of scientific techniques within the locality. The second ecosystem or habitat selected for comparison will be natural and from another country and, for this research, the learner will need to determine the key characteristics and level of biodiversity.

This assignment will provide opportunities for the development of identification skills for plants and animals and will develop the technical skills required to survey soils and water.

### Task setting

Internal assessments must aim to be holistic in nature and encourage learners to produce evidence to cover the Assessment criteria.

The assignment set must cover the tasks as set out in the table below.

Task	Form(s) of evidence	LO mapping
Practical research to determine the ecology and characteristics of a local ecosystem or habitat	<p>The following must be provided:</p> <ul style="list-style-type: none"> <li>• records of research including:               <ul style="list-style-type: none"> <li>– soil and water survey</li> <li>– plant and animal communities survey</li> <li>– effects of natural and managed activities</li> <li>– energy flow</li> <li>– key characteristics and biodiversity levels.</li> </ul> </li> </ul>	LO3
Presentation of a scientific report which provides a comparison between two sites	<p>The following must be provided:</p> <ul style="list-style-type: none"> <li>• analysis of the interrelationships between environmental and physical characteristics on the landscape</li> <li>• evaluation of effects of ecological factors on animals, plants and the distribution of Environmental and Land-based organisations</li> <li>• conclusions to justify the viability of a range of business proposals.</li> </ul>	LO1, 2, 4

### Duration

The assessment is not time constrained. The following is a guide to appropriate times for the activities:

Practical research – 3 hours

Report – 3 hours.

### Sector relevant purpose

Learners will relate research findings to proposals for business uses that are found locally, nationally or globally in the Environmental and Land-based sector to assess significant environmental characteristics and determine viable proposals.

## Demand

The learner will complete an assignment which will be based upon a comparison of habitats and/or ecosystems, one of which will be investigated in detail through the use of scientific techniques within the locality. The second ecosystem will require secondary research to determine the key characteristics and level of biodiversity of an environment or habitat that is natural and from another country, for the purpose of comparison.

At least two business proposals for environmental use need to be generated for each site.

The report must be presented as a formal scientific report and should be directed at senior representatives of the owners of the environments selected for comparison.

## Task taking

Data collection for local surveys will be carried out as a team activity (and shared as appropriate to all members of the group) but analysis and conclusions must be produced independently.

Details of other controls that should be applied during the taking of the assessment tasks are set out on pages 114–116 of the specification.

3

## Weighting of Learning outcomes

Learning outcomes	Marks	Weighting
1 Understand the principles of ecology and ecosystems	21	23.3%
2 Understand the importance of biodiversity	21	23.3%
3 Know the principles of surveying techniques used to analyse habitats	18	20%
4 Be able to assess the viability of a habitat for different uses	30	33.3%
<b>Total</b>	<b>90</b>	<b>100%</b>

## Assessment grid

Please note that the descriptions in this marking grid relate to the top of each band. Further guidance on using marking grids is available in the Assessment section of this specification.

Learning outcomes	Band 1	Band 2	Band 3
	The learner has:		
	0 to 7 marks	8 to 14 marks	15 to 21 marks
1 Understand the principles of ecology and ecosystems	<p>Explained some aspects of the concept of ecology.</p> <p>Explained in modest detail how animal and plant communities develop and interact.</p> <p>Interpreted with limited accuracy the interrelationship between some of the abiotic and some of biotic elements and charted with limited accuracy some aspects of the energy flow within an ecosystem.</p>	<p>Explained most aspects of the concept of ecology.</p> <p>Explained in some detail how animal and plant communities develop and interact.</p> <p>Interpreted with some accuracy the interrelationship between the abiotic and biotic elements and charted the energy flow within an ecosystem.</p>	<p>Explained in detail most aspects of the concept of ecology.</p> <p>Explained in comprehensive detail how animal and plant communities develop and interact.</p> <p>Interpreted in detail the interrelationship between all the abiotic and biotic elements and charted accurately all required aspects of the energy flow within an ecosystem.</p>
	0 to 7 marks	8 to 14 marks	15 to 21 marks
2 Understand the importance of biodiversity	<p>Explained with limited detail the importance of biodiversity in ecosystems.</p> <p>Explained with limited detail and accuracy the effects of natural and managed influences on soil, water and biodiversity in an environment.</p> <p>Explained in limited detail how most animal and plant characteristics fit and are influenced by some environmental conditions.</p>	<p>Explained with some detail the importance of biodiversity in ecosystems.</p> <p>Explained the effects of natural and managed influences on soil, water and biodiversity in an environment.</p> <p>Explained how most animal and plant characteristics fit and are influenced by some environmental conditions.</p>	<p>Explained in detail the importance of biodiversity in ecosystems.</p> <p>Explained in detail the effects of natural and managed influences on soil, water and biodiversity in an environment.</p> <p>Explained in detail how most animal and plant characteristics fit and are influenced by some environmental conditions.</p>
	0 to 6 marks	7 to 12 marks	13 to 18 marks
3 Know the principles of surveying techniques used to analyse habitats	<p>Outlined a limited selection of the range of scientific techniques used to survey habitats.</p> <p>Described in limited detail how data can be used to influence the use of a habitat by an Environmental and Land-based enterprise.</p>	<p>Outlined some of the range of scientific techniques used to survey habitats.</p> <p>Described in some detail how data can be used to influence the use of a habitat by an Environmental and Land-based enterprise.</p>	<p>Outlined a wide range of scientific techniques used to survey habitats.</p> <p>Described in comprehensive detail how data can be used to influence the use of a habitat by an Environmental and Land-based enterprise.</p>

## Assessment grid (continued)

Learning outcomes	Band 1	Band 2	Band 3
	The learner has:		
	0 to 10 marks	11 to 20 marks	21 to 30 marks
4 Be able to assess the viability of a habitat for different uses	<p>Used a few appropriate scientific techniques, working with particular colleagues, to survey some aspects of the ecological characteristics of a habitat.</p> <p>Analysed a limited selection of data to identify the ecology of a habitat.</p> <p>Generated a limited set of ideas for the use of a habitat by an Environmental and Land-based enterprise.</p> <p>Drew a few conclusions, using limited selection of reasoned arguments, on the use of habitat by an Environmental and Land-based enterprise.</p>	<p>Used appropriate scientific techniques, working with colleagues, to survey some aspects of the ecological characteristics of a habitat.</p> <p>Analysed some of the data to identify the ecology of a habitat.</p> <p>Generated some ideas for the use of a habitat by an Environmental and Land-based enterprise.</p> <p>Drew conclusions, using some reasoned arguments, on the use of habitat by an Environmental and Land-based enterprise.</p>	<p>Used a wide range of appropriate scientific techniques, working with all colleagues, to survey all aspects of the ecological characteristics of a habitat.</p> <p>Analysed in detail the data to identify the ecology of a habitat.</p> <p>Generated a wide range of ideas for the use of a habitat by an Environmental and Land-based enterprise.</p> <p>Drew detailed conclusions, using all reasoned arguments, on the use of habitat by an Environmental and Land-based enterprise.</p>

## Guidance for delivery

The theme for this unit is ‘the productive and working environments’ and it links very closely to Level 3 Unit 2: The management of natural resources and successful production systems, and Level 3 Unit 3: Business management and careers in the Environmental and Land-based sector. There are also links with Level 3 Unit 9: Research methodology, evaluation and environmental analysis.

Learners will analyse a range of issues and consider their significance for today’s Environmental and Land-based enterprises. Links with the Environmental and Land-based sector should be broad and varied for this unit. The Learning outcomes seek to balance learners’ practical involvement with the essential underpinning knowledge and understanding of how the Environmental and Land-based sector undertakes these same tasks as part of their environmental management obligations.

Fieldwork will enable learners to apply theory to practice. There are natural opportunities to work on site in local habitats and to develop learners’ skills in and understanding of generating evidence used to model land development possibilities within areas they know and, in some cases, for enterprises or organisations with which they are familiar. There can be a powerful link between the work that learners do on the site and their role in deciding recommendations for what should happen next.

Learners will benefit from seeing the investigative techniques used in the field. On-site collection, collation and display of data will offer opportunities for using mobile IT-based logging tools. There are opportunities for learners to learn from each other as they share their work, responsibilities and experiences, especially where these experiences differ markedly from their peers’. It is possible that some learners have direct experience of organisations with interests and activities in this area. These learners and their experiences offer teachers contrasting contexts against which some aspect of the unit’s content and other learners’ experiences can be set. Small group working may enable a cohort of learners to study more than one site and offer the chance to compare findings and analyses between sites.

While the choice of delivery techniques will depend on the needs of individual learners, the unit’s content encourages the use of a blend of problem-solving approaches, which include full class and small group discussions, seminars, presentations, laboratory sessions, case studies and mini lectures as well as site visits, outside speakers and demonstrations. These active approaches to delivering the content could work particularly well for this topic.

There are opportunities for learners to use the classroom and information technology facilities when locating and mapping site references through global positioning systems (GPS). Word processing, spreadsheet and database software will help with report writing and the adaptation and display of data for different audiences.

Working with living organisms provides opportunities to raise issues about care obligations and protection legislation issues with learners, which can link with content in other parts of the qualification. The practical aspects will develop handling and recording skills and, in some instances, the same habitats could be used for this unit and for Level 3 Unit 9: Research methodology, evaluation and environmental analysis.

## Opportunities for applied learning

Environmental and Land-based organisations and the staff who work for them can contextualise the unit's content. Their staff could work alongside learners on sites for which they have a responsibility or on sites in other places with similar characteristics to their own. Learners might shadow these staff as they undertake their work tasks to compare commercial investigative techniques with the theory they have covered.

In the same way, professionals can contribute information and evidence on learners' skills when working on their premises or provide data and action plans for past site assessments which can be used as case studies with learners. Environmental and Land-based organisations may also be willing to provide staff to join audiences to whom learners present the outcomes of their investigations and who can question them on the findings in an informed way.

Learners could be given data or information by organisations working on important projects whose scale would prohibit direct learner involvement, but through the staff member the project and its work can be made available to learners for comparative analysis and evaluation.

## Suggested prior learning

Level 2 Unit 1: Environmental influences upon ecosystems and Environmental and Land-based production enterprises. GCSE Science and Geography and a general interest in the environmental and habitats.

## Personal, Learning and Thinking Skills

The list below is indicative of the way this unit supports the development of PLTS, as opposed to the achievement of PLTS that are possible through the assessment. The unit supports the development of more PLTS than are covered through the Assessment criteria alone.

Alternative approaches could be selected.

The learner could develop PLTS by:

### Independent enquirers

- planning and carrying out research on habitats within the UK
- analysing and evaluating information gathered for the biodiversity of the environments

### Creative thinkers

- generating ideas when developing a diagram for the flow of energy within an ecosystem and when exploring the possible effects of natural and managed activities on soil

### Reflective learners

- reviewing progress as the practical activities are developed

### Team workers

- co-operating with others when carrying out group work whilst collecting data from a range of habitats within an ecosystem

### Self-managers

- organising time and resources when carrying out testing and recording activities.

## Opportunities for Functional Skills development

This unit and its associated learning activities will provide the learner with opportunities to develop and use English, mathematics and ICT in a number of ways.

There are extensive opportunities to develop a range of Functional Skills through the text based and practical research activities within this unit. For example, the investigation and reporting on subjects such as the interaction of animal and plant communities will expose learners to a variety of text types and require sound writing skills to demonstrate understanding. The conducting of an environmental survey requires planning and reporting skills which will also involve some number skills such as data collection and interpretation, fractions, decimals etc. Further analysis of findings may also require ratio and proportion calculations.

If work for this unit is generated electronically, the learner will have the opportunity to develop skills and/or evidence for the Functional Skills in ICT.

## Suggested learning resources

### Books

Soffe, R. J. (Editor) (2005). *The Countryside Notebook*. Published: Blackwell Science. ISBN: 978-1405112314.

Rose, F.; O' Reilly, C. (2006). *The Wild Flower Key – How to identify wild plants, trees and shrubs in Britain and Ireland*. Published: Fredrick Warne. ISBN: 978-0723251750.

Henderson, P. (2003). *Practical methods in Ecology*. Published: Blackwell Publishing. ISBN: 978-1405102445.

Byrne, K. (2001). *Environmental Science – Third Edition*. Published: Nelson Thornes Ltd. ISBN: 978-0174483052.

C. Park (2008). *A Dictionary of Environment and conservation*. Published: OUP Oxford. ISBN: 978-0198609964.

Smithson, P.; Addison, K.; Atkinson, K. (2002). *Fundamentals of the Physical Environment*. Published: Routledge. ISBN: 978-0415232944.

Riess, M.; Chapman, J. (2000). *Environmental Biology*. Published: Cambridge University Press. ISBN: 978-0521787277.

Newton, A. (2007). *Forest Ecology and Conservation: A Handbook of Techniques*. Published: Oxford University Press. ISBN: 978-0198567455.

Peterson, R. T.; Mountfort, G. Hollom, P. A. D. (2004). *A Field Guide to the Birds of Britain and Europe*. Published: Houghton Mifflin Company. ISBN: 978-0618166756.

### Websites

- FSC (Field Studies Council) [www.field-studies-council.org](http://www.field-studies-council.org)
- Forestry Commission GB [www.forestry.gov.uk](http://www.forestry.gov.uk)
- Environmental Agency [www.environmentagency.gov.uk](http://www.environmentagency.gov.uk)
- Natural England [www.naturalengland.org.uk](http://www.naturalengland.org.uk)
- Department for Environment, Food & Rural Affairs [www.defra.gov.uk](http://www.defra.gov.uk)
- The Wildlife Trusts [www.wildlifetrusts.org](http://www.wildlifetrusts.org)
- ADAS UK Ltd [www.adas.co.uk](http://www.adas.co.uk)
- British Ecological Society [www.britishecologicalsociety.org](http://www.britishecologicalsociety.org)
- RSPB [www.rspb.org.uk](http://www.rspb.org.uk)
- Mammal Society [www.abdn.ac.uk/mammal](http://www.abdn.ac.uk/mammal)

# Level 3 Unit 2: The management of natural resources and successful production systems

## What is this unit about?

Resources are essential to any business. It is good business sense to manage resources in a cost-effective and sustainable way to ensure that they last as long as possible, are of a high and consistent quality and can be used economically by price-conscious, competitive Environmental and Land-based enterprises.

In the Environmental and Land-based sector, many resources are inanimate such as peat, coal, water, air, stone and marble. Some of these inanimate resources can be used straightforwardly from their natural environment; quarries extract stone and marble from the ground and utility companies draw water from streams and lakes.

However, many other resources used in the Environmental or Land-based sector are living resources, for example horses, pigs, cereal crops, grass, vegetables or trees. Some of these living resources – for example grass, game birds and trees thrive in natural environments and can be used directly from their natural habitats. Many other living resources require special arrangements in which their care can be carefully managed. Some crops are grown in large, carefully controlled greenhouses and some food chain animals such as cows, pigs and poultry are kept on animal farms where their welfare can be more easily managed. These animal and plant production systems working to high welfare standards are used by the sector's enterprises to ensure the consistent supply of affordable, high quality products for consumers.

This unit considers the factors influencing natural resources and production systems. It will consider the ways in which managing these resources affects the environment. It also considers how the welfare of plants and animals in production systems is addressed and how, by making the right management decisions, the quality of a range of important products is maintained or improved. The unit looks at some of the environmental approaches undertaken by the sector's resources managers to ensure that their work with living plants and animals is of the highest quality and sustainable.

This unit has particular emphasis for the following Personal, Learning and Thinking Skills (PLTS):

- reflective learners
- team workers.

## Guided learning hours

This unit has 60 GLH assigned to it, of which approximately 8 hours will be needed for the assessment. Details of specific controls needed in relation to the internal assessment are shown in the Assessment section of this unit. Overall information on controls is on pages 114–118 of this specification.

## Content details

<b>Learning outcomes</b> The learner will:	<b>Assessment criteria</b> The learner can:	<b>PLTS</b>
1 Understand the strategies used by Environmental and Land-based enterprises to manage their resources	a explain why resource management is important to Environmental and Land-based enterprises	
	b explain how intervention programmes are part of an effective resource management strategy for Environmental and Land-based enterprises	
2 Know how the health of plants and animals is managed for production	a describe how the quality of living resources used by Environmental and Land-based businesses and enterprises is managed and developed	
	b describe how Environmental and Land-based businesses and enterprises maintain the health and welfare of living resources and care for the environments in which they live	
	c describe how environmental issues can impact on living resources	
3 Be able to plan and implement a management strategy for living resources	a use a basic model to predict environmental impacts on living resources	
	b develop a strategy, with others, to manage a living resource for an Environmental and Land-based enterprise	TW1
	c implement a management strategy for living resources	TW5
	d review the effectiveness of the resource management strategy, to inform future improvement	RL3

Where the Assessment criteria show a direct link to an area of the PLTS framework, it is referenced here. Further information on PLTS is available on pages 10–12 of the specification and also within this unit in the section on Personal, Learning and Thinking Skills.

3

## Scope of content

This section gives details of the scope of content to be covered in the teaching of this unit, to ensure that all the Learning outcomes can be met. This includes examples relating to breadth and depth where applicable.

It is important that, through the Level 3 Principal Learning in Environmental and Land-based Studies, learners receive as broad an experience of the whole sector as possible. Teachers are urged to refer to, and use examples from, appropriate industries where relevant. Details of these industries may be found on page 15 of the specification.

### Learning outcome 1

Teachers must give learners a strategic overview of how the plants and animals required by society are managed. It must include an outline of the approaches used to manage different types of plants and animals in situ, ie when they are in the environments in which they are usually kept or live. Learners should understand how these plants and animals can be considered as a business resource and that ensuring the correct welfare and care standards for them are the foundation of successful resource management. The plants and animals considered must include examples of wild and cultivated production plants and wild and production animals.

The contribution of modern resource management techniques to sustainable development objectives must also be taught. Learners should appreciate that good resource management and efficient production systems are based on sound scientific, economic and environmental principles and that resource management costs are an important consideration for competitive sector businesses. Teachers must give learners an understanding of how resource management affects business productivity and the implication for enterprises of weak resource management.

Teachers must give learners an understanding that the basis of successful resource management is the actions taken by the business. Learners should know how the nature, timing, intensity and duration of these actions (or interventions) on wild and controlled production systems may differ. Teachers are to give learners the opportunity to explain why and how the intervention techniques are used, and why intervention can take different forms depending upon the resource being managed, the prevailing circumstances and the outcomes required.

Learners must be given an understanding that the resource management strategies often have to serve the interests of various stakeholders and be able to explain how a strategy does this.

### Learning outcome 2

Teachers must provide learners with an appreciation of the significance and scale of commercial animal and plant production management. They must be taught to show how commercial management strategies for plants and animals lead to good health and welfare standards and a range of important products with uses in food manufacturing, materials development, energy production, recreation, and animal feeds production, where the quality of the product is critical to customers, clients and consumers. Learners must see examples of the effects of effective management strategies in practice. They should understand the purpose behind a strategy, how it was implemented and the effects it has had. Suitable examples might include green spaces, wild area or food production sites where interventions by managers have altered the area's nature.

Learners must be taught how a selection of common production plants and animal resources are managed, know how the quality of animal and plant resources is assessed and how the strategies and techniques used to manage them ensure quality. The relative advantages of commercial wild and managed production systems for delivering high quality products should be clear and learners should be able to explain how the management of the plants/animals in these environments delivers quality.

The implication for the environment of the commercial management of animal/plant resources (eg pollution, waste) must also be covered. Some of the common types of pollutant and their effects are to be studied. Learners should know how natural and man-made environmental factors affect wild plants and wild animals and any implications for the quality of the products derived from them.

Teachers must provide learners with an understanding of the importance of consistent quality and the need for enterprises to continuously develop and improve their products by managing their resources. The role of breeding for selected traits must also be covered, as well as the principles behind stocking/re-stocking by enterprises with living resources which have quality characteristics matched to current and future markets. Issues such as growth rates, costs, fit for purpose standards, disease resistance, minimised environmental impact, best examples of the type of living resource, value for money, competitive advantage and the quality of products derived from these resources must be considered.

### **Learning outcome 3**

Learners are required to plan and implement a resource management strategy. Working with others, learners must undertake an analysis of the site (including pollution testing), and be able to use a basic model of it to look at the current state of living resources they want to manage and to predict what will happen to resources if left alone.

Teachers must provide learners with the opportunity to develop objectives, expected outcomes, action plans and implementation schedules for managing living resources. Learners should also review previous management strategies used on the site and any evidence of its impacts.

Learners must be taught how to develop a strategy. This requires them to model the anticipated impacts; set progress indicators; and identify risks, potential errors and the likely intervention techniques to be used, along with their expected impacts. If an approach builds on previous strategies learners must show how their proposals add value. Teachers must make sure learners are able to justify their decisions and actions.

As the strategy is implemented, learners must monitor progress, review effectiveness and be able to amend the strategy if suitable progress is not achieved.

## Assessment

This unit is assessed through a centre set and marked assignment. Internal assessments are subject to moderation by AQA-City & Guilds.

The assignment will comprise a practical habitat management assessment and the development of a management strategy to meet the interests of a range of stakeholders.

### Task setting

Internal assessments must aim to be holistic in nature and encourage learners to produce evidence to cover the Assessment criteria.

The assignment set must cover the tasks as set out in the table below.

Task	Form(s) of evidence	LO mapping
Assessment of the habitat	The following must be provided: <ul style="list-style-type: none"> <li>• research data</li> <li>• environmental analysis of the area</li> <li>• research and consultations with stakeholders</li> <li>• a summary of stakeholders' interests and how the strategy will meet their needs</li> </ul>	LO1 and 2
Development of a management strategy	The following must be provided: <ul style="list-style-type: none"> <li>• plan for the strategy</li> <li>• intervention methods to be used, their risks and expected impacts</li> <li>• risk analysis</li> <li>• customer need survey</li> <li>• records of research</li> <li>• any supporting data used</li> <li>• presentation of strategy</li> </ul>	LO3
Evaluation of the business strategy	The following must be provided: <ul style="list-style-type: none"> <li>• report of the effectiveness of the business strategy and recommendations for the future</li> </ul>	LO3

### Duration

The assessment is not time constrained. The following is a guide to appropriate times for the assessment activities:

Assessment of the habitat – 4 hours

Business strategy development – 3 hours

Presentation of the business strategy – no longer than 10 minutes

Evaluation report of business strategy – 1 hour.

### Sector relevant purpose

The assignment will reflect the requirements for planning and management of living resources and the development of intervention strategies by an Environmental and Land-based enterprise.

## Demand

Recommended strategy may be based on wild or domesticated contexts.

The plan and evaluation should be no more than six pages in length.

The presentation is aimed at senior management or owners of the business studied.

## Task taking

Details of controls that should be applied during the taking of the assessment tasks are set out on pages 114–116 of the specification.

## Weighting of Learning outcomes

Learning outcomes	Marks	Weighting
1 Understand the strategies used by Environmental and Land-based enterprises to manage their resources	24	26.7%
2 Know how the health of plants and animals is managed for production	30	33.3%
3 Be able to plan and implement a management strategy for living resources	36	40%
<b>Total</b>	<b>90</b>	<b>100%</b>

## Assessment grid

Please note that the descriptions in this marking grid relate to the top of each band. Further guidance on using marking grids is available in the Assessment section of this specification.

Learning outcomes	Band 1	Band 2	Band 3
	The learner has:		
	0 to 8 marks	9 to 16 marks	17 to 24 marks
1 Understand the strategies used by Environmental and Land-based enterprises to manage their resources	<p>Briefly explained why resource management is important to an Environmental and Land-based business.</p> <p>Briefly explained how intervention programmes are part of an effective resource management strategy for an Environmental and Land-based enterprise.</p>	<p>Explained why resource management is important to an Environmental and Land-based business.</p> <p>Explained how intervention programmes are part of an effective resource management strategy for an Environmental and Land-based enterprise.</p>	<p>Explained in detail why resource management is important to an Environmental and Land-based business.</p> <p>Explained in detail how intervention programmes are part of an effective resource management strategy for an Environmental and Land-based enterprise.</p>
	0 to 10 marks	11 to 20 marks	21 to 30 marks
2 Know how the health and welfare of plants and animals is managed for production	<p>Briefly explain how the quality of living resources used by an Environmental and Land-based business are managed and developed.</p> <p>Briefly evaluated how an Environmental and Land-based business maintains the health and welfare of living resources and cares for the environments in which these live.</p> <p>Briefly described how environmental issues can impact on living resources.</p>	<p>Explained how the quality of living resources used by an Environmental and Land-based business are managed and developed.</p> <p>Evaluated how an Environmental and Land-based business maintains the health and welfare of living resources and cares for the environments in which these live.</p> <p>Described how environmental issues can impact on living resources.</p>	<p>Explained in detail how the quality of living resources used by an Environmental and Land-based business are managed and developed.</p> <p>Evaluated in detail how an Environmental and Land-based business maintains the health and welfare of living resources and cares for the environments in which these live.</p> <p>Described in detail how environmental issues can impact on living resources.</p>
	0 to 12 marks	13 to 24 marks	25 to 36 marks
3 Be able to plan and implement a management strategy for living resources	<p>Used a brief model and vaguely predicted the environmental impacts on living resources.</p> <p>Developed some parts of a strategy to manage a living resource, showing limited involvement with others.</p> <p>Simplistically implemented a resource management strategy.</p> <p>Simplistically reviewed the effectiveness of a resource management strategy.</p>	<p>Used a basic model to predict environmental impacts on living resources.</p> <p>Developed parts of a strategy to manage a living resource, working with others.</p> <p>Implemented a resource management strategy.</p> <p>Reviewed the effectiveness of a resource management strategy.</p>	<p>Used a detailed model and predicted clear environmental impacts on living resources.</p> <p>Developed most parts of a strategy to manage a living resource and worked comprehensively with others.</p> <p>Comprehensively implemented a resource management strategy.</p> <p>Reviewed in detail the effectiveness of a resource management strategy.</p>

## Guidance for delivery

The theme for this unit is ‘the productive and working environments’. It provides learners with an appreciation of how the demands for quality plants and animals are met. It shows learners that commercial enterprises in the sector are adaptable and productive and can respond to changed circumstances in measured and managed ways.

It is important that learners consider resource management in context, which means the management of plants and animals in their usual habitats. This approach will allow learners to evaluate the situation in which the plants and animals exist and develop a clearer understanding of the issues which naturally affect them. Learners will benefit from visiting habitats and commercial production units to see tailored resource management practices in action. The emphasis is on approaches rather than on securing an expected outcome.

Professionals working in this area are especially useful, as their experiences and insights provide learners with an opportunity to observe and question them about approaches.

Teachers may wish to stipulate or limit choice where there are limitations on resources, and animal welfare must be considered. Resources will have to be accessible so that learners can explore ideas and get feedback. The unit provides opportunities for learners to work independently, in pairs, or as part of a team. Teachers should recognise that learners’ choices about the ways in which they work may change as the unit progresses, and that their preferences should be acknowledged. Consortia are encouraged to consider a diversity of approaches to the content to enable learners to explore different ways of working, and to reflect on dissimilar outcomes. The use of technology to structure and undertake learning activities is encouraged.

## Opportunities for applied learning

The offer of guidance, support and encouragement from professionals is a motivating experience for many learners. Learners could be provided with the opportunity to consider some of the management tasks in action by shadowing professionals working in the field. Learners should not only see skills in action but also develop their understanding of the industry and consider it as a potential career.

Access to special habitats and dedicated production units can sometimes be secured only through enterprises. If such areas can be made available to learners, they will benefit from learning about the experiences of different enterprises working there. Opportunities should be looked for to structure learners’ work to make relevant contributions to ongoing resource management through their investigations and project topics. Contact with professionals will enable learners to develop commercial knowledge and skills, and offer opportunities to explore important and detailed aspects of resource management that may not otherwise be available. The best experiences of this kind will provide learners, through observing and interacting, with specific unit related knowledge and also will build their knowledge of a range of relevant business topics such as finance and health and safety which will prepare for or consolidate other parts of this qualification.

## Personal, Learning and Thinking Skills

The list below is indicative of the way this unit supports the development of PLTS, as opposed to the achievement of PLTS that are possible through the assessment. The unit supports the development of more PLTS than are covered through the Assessment criteria alone.

Alternative approaches could be selected.

The learner could develop PLTS by:

### Creative thinkers

- asking questions to consolidate their understanding and extend their thinking when evaluating the use of management strategies
- connecting their own ideas about resource management with those of others

### Self-managers

- organising time and resources when undertaking multistage activities to intervene in a habitat
- prioritising tasks and managing calculated risks, where necessary, to complete tasks to the required standard

### Effective participators

- agreeing how tasks will be done and the order in which they should be undertaken when working co-operatively
- influencing decisions by presenting a persuasive case in initial discussions and contributing in the same positive and informed way to any necessary follow-up discussions if amendments to the plans are required.

## Opportunities for Functional Skills development

This unit and its associated learning activities will provide the learner with opportunities to develop and use English, mathematics and ICT in a number of ways.

There are extensive opportunities for research on subjects covered within this unit such as resource management. This will afford learners a range of reading experiences as well as writing opportunities when it comes to reporting findings, creating a resource management strategy requiring recommendations (to written clearly and persuasively), and providing guidance.

If work for this unit is generated electronically, the learner will have the opportunity to develop skills and/or evidence for the Functional Skills in ICT.

## Suggested learning resources

### Books

Soffe, R. J. (Editor) (2005). *The Countryside Notebook*. Published: Blackwell Science. ISBN: 978-1405112314.

Henderson, P. (2003). *Practical methods in Ecology*. Published: Blackwell Publishing. ISBN: 978-1405102445.

Byrne, K. (2001). *Environmental Science: 3rd Edition*. Published: Nelson Thornes. ISBN: 978-0174483052.

Park, C. (2008). *A Dictionary of Environment and conservation*. Published: Oxford University Press. ISBN: 978-0198609964.

Kump, L. R.; Kasting, J. F.; Crane, R. G. (2003). *The Earth System: An Introduction to Earth Systems Science*. Published: Prentice Hall. ISBN: 978-0131420595.

Smithson, P.; (2002). *Fundamentals of the Physical Environment*. Published: Routledge. ISBN: 978-0415232944.

Riess, M.; Chapman, J. (2000). *Environmental Biology*. Published: Cambridge University Press. ISBN: 978-0521787277.

White, R. (2005). *Principles and Practice of Soil Science: The Soil as a Natural Resource*. Published: Wiley-Blackwell. ISBN: 978-0632064557.

Singer, M.; Munns, D. (1998). *Soils: an introduction*. Published: Prentice Hall. ISBN: 978-0136792420.

Chapman, J. L.; Reiss, M. J. (1998). *Ecology: Principles and Applications*. Published: Cambridge University Press. ISBN: 978-0521588027.

### CDs CD-ROMs and DVDs

- Emeritus Clive Stace, C.E.; van der Meijden, R and de Kort, I. *Interactive Flora of the British Isles*. DVD-ROM (2004).

### Websites

- FSC (Field Studies Council) [www.field-studies-council.org](http://www.field-studies-council.org)
- Forestry Commission GB [www.forestry.gov.uk](http://www.forestry.gov.uk)
- Natural Environment Research Council [www.nerc.ac.uk](http://www.nerc.ac.uk)
- Department for International Development [www.dfid.gov.uk](http://www.dfid.gov.uk)
- Environmental Agency [www.environmentagency.gov.uk](http://www.environmentagency.gov.uk)
- Natural England [www.naturalengland.org.uk](http://www.naturalengland.org.uk)
- Department for Environment, Food & Rural Affairs [www.defra.gov.uk](http://www.defra.gov.uk)
- The Wildlife Trusts [www.wildlifetrusts.org](http://www.wildlifetrusts.org)
- International Institute for Environment & Development [www.iied.org](http://www.iied.org)

# Level 3 Unit 3: Business management and careers in the Environmental and Land-based sector

## What is this unit about?

In common with other organisations, Environmental and Land-based businesses rarely exist in isolation. They are part of a large and important web of linked enterprises working together within and outside the Environmental and Land-based sector. Many share a deep enthusiasm for the sector, its work and their part in it, and successfully balance their business obligations and responsibilities with a dynamic and infectious commitment to be professionally and financially successful organisations.

It does not matter if an organisation is providing goods or services for business or individuals in the animal, plant, power, water or food sectors in or outside the UK – they are part of a vital and vibrant sector which offers many different, challenging and exciting employment opportunities to people of all abilities and interests.

Whether they are large or small, local or global, mainstream or niche, all professional organisations require sound business principles underpinning their activities along with well-trained and effective managers at a time when environmental issues are increasingly significant, competition is intense and markets are changing. Knowing what a business needs now and in the future and having the right managers with the right skills to fulfill these needs are critical to long-term business success.

In this unit learners will explore the range of enterprises, which comprise the Environmental and Land-based sector and look at the importance of their activities and products to customers, clients and wider society. Learners will look at the ways in which organisations working in the sector structure themselves, manage their affairs and develop their activities and interests to remain competitive, responsible, professional and profitable.

The best organisations use the skills of all their staff to grow and develop, which means they have to know the expertise that exists within their staff and how this fits with their business development plans. They have to identify any skills gaps in their organisation and have ways to deal with them, such as developing the skills of their current staff or recruiting new staff with the skills. Learners will consider how businesses make use of these skills and can go on doing so as their staff develop and expand their own careers alongside the development of the business itself.

There will be opportunities for learners to look at some of the core competences of a modern Environmental or Land-based business and consider some of the strategic business issues which their managers address on a regular basis. They will be asked to bring these issues together and develop a business strategy for an Environmental and Land-based enterprise.

This unit has particular emphasis for the following Personal, Learning and Thinking Skills (PLTS):

- independent enquirers
- creative thinkers
- reflective learners
- team workers
- effective participators.

## Guided learning hours

This unit has 90 GLH assigned to it, of which 7 hours will be needed for the assessment. Details of specific controls needed in relation to the internal assessment are shown in the Assessment section of this unit. Overall information on controls is on pages 114–118 of this specification.

## Content details

Learning outcomes The learner will:	Assessment criteria The learner can:	PLTS
1 Understand the contribution of the Environmental and Land-based sector	a analyse the range of industries within the sector and their importance to local, national and global economies	
	b determine the professional and personal skills required by employers and employees	
	c describe the career pathways available in the Environmental and Land-based sector	
	d explain how Environmental and Land-based businesses are structured to meet their own and customer needs	
2 Understand the principles of Environmental and Land-based business management	a explain how business principles are put into practice	
	b analyse how quality management affects the way businesses operate	
	c analyse the impact of customer influence and marketing on business operation	
	d explain the operation of supply-chain management in businesses	
3 Be able to analyse risk and customer need for an Environmental and Land-based business	a collect information to analyse business risk, collaborating with others	TW1
	b determine customer needs for a product or service, collaborating with others	TW1
	c analyse information to judge relevance and determine risk for a product or service	IE4
4 Be able to develop a business strategy for an Environmental and Land-based business	a generate ideas for a business strategy	CT1
	b use risk analysis to support a business strategy	
	c present a persuasive case for a business strategy	EP2
	d evaluate the outcome of a business strategy	
5 Be able to develop a career plan for the Environmental and Land-based sector	a carry out a self-appraisal of own skills and attributes	
	b evaluate experience and learning to produce a career plan for the Environmental and Land-based sector	RL5

Where the Assessment criteria show a direct link to an area of the PLTS framework, it is referenced here. Further information on PLTS is available on pages 10–12 of the specification and also within this unit in the section on Personal, Learning and Thinking Skills.

3

## Scope of content

This section gives details of the scope of content to be covered in the teaching of this unit, to ensure that all the Learning outcomes can be met. This includes examples relating to breadth and depth where applicable.

It is important that, through the Level 3 Principal Learning in Environmental and Land-based Studies, learners receive as broad an experience of the whole sector as possible. Teachers are urged to refer to, and use examples from, appropriate industries where relevant. Details of these industries may be found on page 15 of the specification.

### Learning outcome 1

Teachers must give learners a detailed appreciation of the range of industries within the Environmental and Land-based sector, their importance to local, regional and national UK and international economies and how these organisations interrelate.

The importance of the industries must be clear. The breadth and depth of industry's contribution to society's economic wellbeing, its quality of life targets and its environmental objectives must be understood.

Coverage will include industries representative of the full depth and wide diversity of the Environmental and Land-based sector. This will mean industries and organisations operating in mainstream and niche parts of the sector; examples of small, medium and large businesses; and examples of sole trader, self-employed, voluntary, charities and limited company organisations in the sector. It will include organisations which are providing services as well as products to other businesses within and outside the sector itself. Coverage must be detailed and comprehensive enough to enable learners to analyse both their range and their importance.

Learners must be made aware of how staff in an organisation contribute to its success and how the skills of employees and employers naturally vary across the organisation depending upon the jobs being done. The generic skills required by employers and employees (craft skills, technical and managerial skills and leadership skills) must be covered, as well as the basic management skills needed to organise one's own work and the work of others.

The potential contribution of employees' personal growth and development to business success must be covered, as must the way personal development is managed by the best employers to create careers for their employees which capitalise on the natural drive for professionally and financially rewarding jobs that match an individual's rising skills and ambitions. Learners will cover how career pathways may be created within an organisation, and how these pathways link personal growth and development needs with the needs of the business.

Teachers must give learners opportunities to analyse how businesses are organised in light of what they produce. The businesses should reflect the diversity of the sector and include a range of sizes, operational focus, products and services. The different ways in which organisations structure and manage their activities should be covered. It is an opportunity for learners to match organisational structure with function and to analyse the management structures of different enterprises.

The need for organisations to produce goods or services of consistent quality and in sufficient quantities to meet clients' demands enables learners to evaluate organisational structures and judge their capacity to meet their obligations. How quality management, quality assurance and codes of practice help businesses operate and improve must be covered.

### Learning outcome 2

Learners will benefit significantly from studying this Learning outcome in both Environmental and Land-based businesses, as it gives them opportunities to apply their learning and evaluate current practices and problems.

This outcome enables learners to consider how good business management practice supports business success in today's Environmental and Land-based organisations. The advantages of adopting best business principles, good leadership and sound management, of working ethically, and of having a responsive customer service function to commercial success must be covered.

The contribution to business success of effective communication, good numeracy, IT and teamwork skills, and the increasing significance of creative thinking, self-management, entrepreneurship, motivation and leadership to long-term business success must be clear.

The interests of the sector's stakeholders must be understood. The influence of customers and clients on the activities and development of enterprises and organisations must be clear. Coverage will include the ways in which these businesses connect with and influence customers, stakeholders and clients, how they work with other organisations and how business development intentions raise new challenges and opportunities. The need to manage these activities effectively should be clear, and the nature and range of some of the core management skills required to do so must be understood.

Teachers must give learners an appreciation of how customers' need for consistent and predictable quality of product or service influences the adoption and implementation of rigorous quality standards, sound quality assurance procedure and modern codes of practice in the best Environmental and Land-based enterprises. Learners should also understand how weaknesses in quality management affect organisations.

The contribution of effective marketing to an Environmental or Land-based business, the ways in which marketing is carried out, the common causes of marketing failure, and how marketing is planned, managed and evaluated are to be covered.

The perception of Environmental and Land-based businesses in terms of the public's expectations of them in environmental, social and economic terms should be covered. Teaching should include the political context in which the businesses operate, the challenges of being seen by society as an environmentally dirty/clean business, and how businesses are reacting to the need to act sustainably.

The contribution of effective supply chain management to business success is to be covered. The ways in which enterprises are structured and managed to enable them to source, secure and transport the right resources at the right time, coordinate the operational use of these resources and ensure that their products or services are distributed to clients and customers appropriately, underpin supply chain management. Learners must know how this issue is addressed in Environmental and Land-based sector businesses.

### **Learning outcome 3**

That modern businesses have to manage a variety of risks must be clear to learners. Learners must appreciate that risks in different business are themselves different and that business success depends upon identifying risks and managing them. The common generic business risks are to be covered as well as those risks which specifically relate to the environmental nature of the work undertaken by enterprises working in the sector. Learners must be able to collect information on business risk.

The business risks associated with new product development must be covered. The ways in which these risks are managed by Environmental and Land-based enterprises and the ways in which businesses research the market and evaluate customers' needs for new services and products should illustrate the significance and importance of product development to the enterprise.

The sophisticated nature of the different ways in which enterprises minimise risks by researching public interest in their proposed products or services, evaluate competitors' products/services, judge the relevance and appeal of the planned developments and set marketing strategies for them, must be covered.

Teachers must show learners how to collect information for a business risk analysis. This will include customer needs and ways to accommodate different customer perspectives. Learners must be able to judge the value and relevance of information in order to obtain meaning from it and arrive at conclusions and recommendations.

## Learning outcome 4

Teachers must give learners an understanding of how business success is linked to formalised and effective management practices. Learners must appreciate the central role of a business strategy to a modern enterprise, what the strategy does for the organisation and how it influences the operational activity and its development of the business. The qualities of a good strategy should be understood, as should the ways in which a strategy is developed, implemented, reviewed and amended. The ways in which strategies are presented to clients, discussed and justified must also be covered.

Learners must be able to develop an appropriate business strategy. They must be able to scope, action plan and undertake the research required; gather, collate and analyse the data generated and report upon outcomes in standard reporting formats.

Learners must be able to work effectively with contradictory or ambiguous findings and outcomes, draw accurate and meaningful conclusions, make appropriate evidence-based recommendations, and communicate and justify their findings and recommendations.

## Learning outcome 5

For this outcome, learners are required to reflect on their own skills and abilities and consider how their interest, enthusiasms and skills match the challenges of the jobs and careers in today's Environmental and Land-based organisations.

Learners must be guided on how to carry out accurate, comprehensive and focused assessment of their own skills, together with a rational appraisal of how these might develop through lifelong learning, further training or education into a realistic career in organisations in the Environmental and Land-based sector.

Learners will need to develop the skills needed to build a personal career plan and recognise the value of it to their own development. They will need to develop an awareness of the significance of setting interim career goals with related success criteria and milestones to enable them to monitor and evaluate their progress.

## Assessment

This unit is assessed through a centre set and marked assignment. Internal assessments are subject to moderation by AQA-City & Guilds.

The learner will research an Environmental and Land-based business, collecting information needed to do a risk analysis and survey customer need. They will also then use this work to inform a business strategy, which they will present.

The strategy and presentation are aimed at the senior management of the business itself.

The assignment will call for the learner to evaluate their research and presentation for suggestions on where to improve their business strategy. The evaluation will also require learners to review possible career pathways highlighted by the business strategy and to map their own personal skills and attributes to those required by employers.

The assignment will take approximately 7 of the 90 guided learning hours available for this unit.

### Task setting

Internal assessments must aim to be holistic in nature and encourage learners to produce evidence to cover the Assessment criteria.

The assignment set must cover the tasks as set out in the table below.

Task	Form(s) of evidence	LO mapping
Business strategy development	The following must be provided: <ul style="list-style-type: none"><li>• risk analysis</li><li>• customer need survey</li><li>• records of research</li><li>• any supporting data used</li></ul>	LO2, 3 and 4
Presentation of the business strategy	The following must be provided: <ul style="list-style-type: none"><li>• presentation of strategy</li><li>• evaluation report of business strategy</li></ul>	LO1, 2, 3 and 4
Career plan	The following must be provided: <ul style="list-style-type: none"><li>• electronic document</li><li>• evaluation report of career pathways</li><li>• record of self-appraisal</li></ul>	LO1 and 5

### Duration

The assessment is not time constrained. The following is a guide to appropriate times for the assessment activities:

Business strategy development – 4 hours

Presentation of the business strategy – no longer than 10 minutes

Evaluation report of business strategy – 2 hours

Career plan – 1 hour.

### Sector relevant purpose

The risk analysis and business strategy must relate to an Environmental and Land-based enterprise.

## Demand

The career plan should be no more than four pages in length.

The presentation is aimed at senior management of the business studied.

## Task taking

Details of controls that should be applied during the taking of the assessment tasks are set out on pages 114–116 of the specification.

## Weighting of Learning outcomes

Learning outcomes	Marks	Weighting
1 Understand the contribution of the Environmental and Land-based sector	15	16.7%
2 Understand the principles of Environmental and Land-based business management	15	16.7%
3 Be able to analyse risk and customer need for an Environmental and Land-based business	24	26.7%
4 Be able to develop a business strategy for an Environmental and Land-based business	24	26.7%
5 Be able to develop a career plan for the Environmental and Land-based sector	12	13.3%
<b>Total</b>	<b>90</b>	<b>100%</b>

## Assessment grid

Please note that the descriptions in this marking grid relate to the top of each band. Further guidance on using marking grids is available in the Assessment section of this specification.

Learning outcomes	Band 1	Band 2	Band 3
	The learner has:		
	0 to 5 marks	6 to 10 marks	11 to 15 marks
1 Understand the contribution of the Environmental and Land-based sector	<p>Analysed a limited range of industries within the sector.</p> <p>Described limited professional and personal skills required by employers and employees.</p> <p>Described a brief career pathway available in the Environmental and Land-based sector, showing some limitation in clarity.</p> <p>Explained to a limited degree how an Environmental and Land-based business is structured to meet its own and customer needs.</p>	<p>Analysed a range of industries within the sector.</p> <p>Described professional and personal skills required by employers and employees.</p> <p>Described a clear career pathway available in the Environmental and Land-based sector.</p> <p>Explained how an Environmental and Land-based business is structured to meet its own and customer needs.</p>	<p>Analysed a comprehensive range of industries within the sector.</p> <p>Described in detail professional and personal skills required by employers and employees.</p> <p>Described a clear and detailed career pathway available in the Environmental and Land-based sector.</p> <p>Explained accurately and in detail how an Environmental and Land-based business is structured to meet its own and customer needs.</p>
	0 to 5 marks	6 to 10 marks	11 to 15 marks
2 Understand the principles of Environmental and Land-based business management	<p>Offered a basic analysis of how an Environmental and Land-based organisation has used some business principles to respond to some public expectations of Environmental and Land-based organisations.</p> <p>Evaluated some important aspects of employers' and employees' personal and professional attributes to some of their roles in a business.</p> <p>Interpreted some of the influences of some of the stakeholders.</p> <p>Explained in limited detail the operation of supply-chain management in a business.</p>	<p>Analysed how an Environmental and Land-based organisation has used business principles to respond to public expectations of Environmental and Land-based organisations.</p> <p>Evaluated important aspects of employers' and employees' personal and professional attributes to their roles in a business.</p> <p>Interpreted influences of stakeholders.</p> <p>Explained the operation of supply-chain management in a business.</p>	<p>Analysed accurately and in detail how an Environmental and Land-based organisation has used business principles to respond to public expectations of Environmental and Land-based organisations.</p> <p>Evaluated accurately and in detail all the important aspects of employers' and employees' personal and professional attributes to their roles in a business.</p> <p>Accurately assessed in detail stakeholder influence.</p> <p>Explained in accurate detail the operation of supply-chain management in a business.</p>

3

## Assessment grid (continued)

Learning outcomes	Band 1	Band 2	Band 3
	The learner has:		
	0 to 8 marks	9 to 16 marks	17 to 24 marks
3 Be able to analyse risk and customer need for an Environmental and Land-based business	<p>Collected limited information for a business risk analysis.</p> <p>Undertaken limited analysis of relevance and determined risk.</p>	<p>Collected information for a business risk analysis.</p> <p>Analysed information, judging relevance and determining risk.</p>	<p>Collected accurate and detailed information for a business risk analysis.</p> <p>Analysed information, with accurate and detailed judgment of relevance, and determined risk.</p>
	0 to 8 marks	9 to 16 marks	17 to 24 marks
4 Be able to develop a business strategy for an Environmental and Land-based business	<p>Generated limited ideas for a business strategy.</p> <p>Presented a case for a business strategy with limited persuasion.</p> <p>Evaluated the outcome of a business strategy with limited accuracy and detail.</p>	<p>Generated ideas for a business strategy.</p> <p>Presented a reasonably persuasive case for a business strategy.</p> <p>Evaluated the outcome of a business strategy with accuracy.</p>	<p>Generated detailed ideas for a business strategy.</p> <p>Presented a persuasive case for a business strategy.</p> <p>Evaluated the outcome of a business strategy with accuracy and detail.</p>
	0 to 4 marks	5 to 8 marks	9 to 12 marks
5 Be able to develop a career plan for the Environmental and Land-based sector	<p>Carried out a limited self-appraisal of own skills and attributes.</p> <p>Produced a limited career plan for the Environmental and Land-based sector.</p>	<p>Carried out a self-appraisal of own skills and attributes.</p> <p>Produced a career plan for the Environmental and Land-based sector.</p>	<p>Carried out a detailed self-appraisal of own skills and attributes.</p> <p>Produced a detailed career plan for the Environmental and Land-based sector.</p>

## Guidance for delivery

This unit will benefit from being completed in an applied manner. Organisations working in the Environmental and Land-based sector offer significant potential to contextualise learning.

The generic nature of the outcomes means that learners can make use of suitable Environmental and Land-based businesses operating in their area. Opportunities to compare and contrast businesses and their operations across the range of enterprises operating in the sector are strongly encouraged.

The unit's content reflects the ways in which enterprises working in the Environmental and Land-based sector operate and develop, and learners should have the opportunity to see how these activities address everyday issues. Learners' capacity to transfer skills of analysis and judgement to new and unfamiliar situations should be encouraged, as should their ability to reflect on the work they have done and to suggest improvements to it.

Learners can learn from each other. They can share experiences of organisations with which they have worked closely and also learn from the experiences of peers whose working experiences differ from their own.

Additional guidance on delivery can be found in the Scope of content section.

3

## Opportunities for applied learning

Links with Environmental and Land-based businesses are at the heart of this unit. Studying businesses in action provides learners with important and unique insights into how organisations address the pressures they face and exploit the opportunities they generate.

The unit roots theory in practice and gives learners the chance to interact with professionals and to apply their learning to real business situations. The strong association with job roles is a particularly compelling aspect of the unit's content and reflected in the links with enterprises. Learning by doing is a theme running throughout this unit.

If local organisations can be encouraged to contribute, they can offer learners a spectrum of experiences. These could include some of the following:

- supervising learner project or supporting learners undertaking practical tasks on their premises
- setting learners' theory in a practical context by illustrating where theory finds an application or expression in their business or organisation
- setting learners real life problems to solve for their organisation
- hosting of learner visits and assignment work
- allowing learners to shadow staff members
- helping to gather evidence of learners' abilities as learners work
- showing learners how their organisations are structured and operate
- allowing learners to interview their staff at various grades within their organisation to gain an insight into jobs, business pressure, professional development and career planning
- providing business data on their organisation and/or jobs for learners to use in their work
- giving talks about their work, and the pressure their organisation faces
- reinforcing health and safety issues in the sector
- helping learners structure and prepare project presentations and attending the presentations to question learners about these.

## Suggested prior learning

It would be advantageous if learners had previous opportunities to work in the sector. It is suggested that learners should have completed Level 2 Unit 2: Working in the Environmental and Land-based sector, as part of the Level 2 Principal Learning Environmental and Land-based Studies.

## Personal, Learning and Thinking Skills

The list below is indicative of the way this unit supports the development of PLTS, as opposed to the achievement of PLTS that are possible through the assessment. The unit supports the development of more PLTS than are covered through the Assessment criteria alone.

Alternative approaches could be selected.

The learner could develop PLTS by:

### Independent enquirers

- analysing data obtained from the survey exploring customer needs

### Creative thinkers

- preparing a business strategy to ensure that the industry satisfies customer needs

### Reflective learners

- assessing themselves for careers, matching themselves with the opportunities and their own achievements

### Team workers

- preparing a questionnaire and carrying out a survey with colleagues, co-operating with others to work towards a common goal

### Self-managers

- identifying career pathways in the sector and any new responsibilities and challenges involved

### Effective participators

- designing a questionnaire, carrying out a survey to collect data and analysing the results, planning the activity in manageable steps.

## Opportunities for Functional Skills development

This unit and its associated learning activities will provide the learner with opportunities to develop and use English, mathematics and ICT in a number of ways.

In order to understand the breadth and depth of industries within the Environmental and Land-based industries, learners will be exposed to a range of texts involving prose and numerical information. These will provide opportunities for reading skills development. In terms of writing there will be a particular emphasis on being able to write persuasively in order to prepare an attractive business strategy, and the integral risk analysis within the strategy will require some basic mathematical calculations to support it.

If work for this unit is generated electronically, the learner will have the opportunity to develop skills and/or evidence for the Functional Skills in ICT.

## Suggested learning resources

### Books

Boulakis, M.; Weightman, P. (2003). *Food Supply Chain Management*. Published: Wiley-Blackwell. ISBN: 978-1405101684.

Dale, B.; Van Der Wiele, T.; Van Iwaarden, J. (2007). *Managing Quality*. Published: Wiley-Blackwell. ISBN: 978-1405142793.

McDonald, M. (2007). *Marketing Plans: How to Prepare Them, How to Use Them*. Published: Butterworth-Heinemann Ltd. ISBN: 978-0750683869.

Porter, M. E. (2008). *On Competition 2nd Edition*. Published: Harvard Business School Press. ISBN: 978-1422126967.

Soffe, R. J. (Editor) (2005). *The Countryside Notebook*. Published: Blackwell Science. ISBN: 978-1405112314.

Soffe, R. J. (2003). *The Agricultural Notebook*. Published: Blackwell Science. ISBN: 978-0632058297.

### Websites

- Department for Environment, Food & Rural Affairs [www.defra.gov.uk](http://www.defra.gov.uk)
- UK Dept for Business, Enterprise & Regulatory Reform [www.berr.gov.uk](http://www.berr.gov.uk)
- Lantra [www.lantra.co.uk](http://www.lantra.co.uk)
- Centre for Business Relationships, Accountability, Sustainability and Society [www.brass.cf.ac.uk](http://www.brass.cf.ac.uk)
- Earthworks [www.earthworks-jobs.com](http://www.earthworks-jobs.com)
- Confederation of British Industry [www.cbi.org.uk](http://www.cbi.org.uk)

## Level 3 Unit 4: Plants and animals: applied science

### What is this unit about?

While many farm plants and animals are common and familiar, the farming industry is only one part of the Environmental and Land-based sector with commercial interests in animals or plants: foresters grow trees, florists work with plants, game keepers rear deer and game birds, greenkeepers and groundsman work with grass, brewers use yeast, equine businesses work with horses, and aquaculture professionals rear fish. In a similar way, but on a larger and more complex scale, the water, waste, food, power and construction enterprises work in natural habitats containing many different plants and animals.

To ensure that these professionals work with their plants and animals in the right way at all times, they have to understand the science behind the living resources on which their livelihoods depend. They have to understand the physiology as well as the biochemistry of these critical resources and they must ensure that they can supply the conditions needed for these to feed, grow and reproduce successfully.

This unit provides learners with an insight into the applied science of plants and animals. With so many different plants and animals in the sector, learning will be focused on representative examples. The unit covers the function and physiology of plants and animals and how their internal systems work, particularly those concerned with nutrition, reproduction and disease.

This unit links with a number of other Level 3 Principal Learning units in the 'plants and animals' theme, particularly Level 3 Unit 5: Plants, animals and humans: how they relate, and Level 3 Unit 6: Plants and animals: safe working practices and relevant legislation. As learners' knowledge of this part of the Environmental and Land-based sector develops, it provides career development opportunities for those with interests in it.

This unit has particular emphasis for the following Personal, Learning and Thinking Skills (PLTS):

- independent enquirers
- effective participators.

### Guided learning hours

This unit has 60 GLH assigned to it, of which approximately 9 hours will be needed for the assessment. Details of specific controls needed in relation to the internal assessment are shown in the Assessment section of this unit. Overall information on controls is on pages 114–118 of this specification.

## Content details

<b>Learning outcomes</b> The learner will:	<b>Assessment criteria</b> The learner can:	<b>PLTS</b>
1 Know the major structures, functions and systems of plants and animals	a describe the basic structures and physiological functions of the components of a plant	
	b describe the basic structure and functions of the biological systems in animals	
2 Know how science supports the management of plants and animals	a explain how plant and animal physiology relates to the management of plant and animal populations	
	b explain the relevant laboratory and scientific techniques used to manage plant and animal populations	
3 Understand the interrelationships between plants and animals	a explain the way in which plants and animals live and interrelate in natural and managed environments	
4 Be able to conduct scientific investigations into plants and animals	a evaluate the physical and environmental factors that affect growth and reproduction of plants and animals	EP1
	b identify the way in which plants and animals live and interrelate in a natural or managed environment	
	c monitor the effects of biotic or abiotic factors on plant and animal populations	IE2

Where the Assessment criteria show a direct link to an area of the PLTS framework, it is referenced here. Further information on PLTS is available on pages 10–12 of the specification and also within this unit in the section on Personal, Learning and Thinking Skills.

## Scope of content

This section gives details of the scope of content to be covered in the teaching of this unit, to ensure that all the Learning outcomes can be met. This includes examples relating to breadth and depth where applicable.

It is important that, through the Level 3 Principal Learning in Environmental and Land-based Studies, learners receive as broad an experience of the whole sector as possible. Teachers are urged to refer to, and use examples from, appropriate industries where relevant. Details of these industries may be found on page 15 of the specification.

### Learning outcome 1

Content must provide learners with a comprehensive understanding of the structures of plants and animals and the differences between them. The relationship between structure and function at cellular, organ and system levels for both plants and animals must be covered. Learners must use as much anatomy and biochemistry as is necessary to understand cellular, organ or system function.

Teachers must give learners opportunities to use a variety of techniques to understand the physiological structure and operation of the nutritional and reproductive systems of both plants and animals. The relationships between the design and the operation of these systems and their contributions to the normal life processes of the plant or animal must be clear. Learners are expected to be familiar with structures at organ and cellular levels, which will require them to use histological techniques and sophisticated laboratory equipment.

To cover the biochemical and physiological aspects comprehensively, learners are expected to undertake rigorous, advanced laboratory investigations and analyses, which require refined laboratory skills and robust scientific method. It is expected that learners will be aware of some of the major sub-cellular components of plants and animals, such as common monomers (for example, amino acids, nucleotides, mono-saccharides); common polymers (for example, peptides, oligo-peptides, polypeptides, proteins, nucleic acids, oligo-saccharides and polysaccharides); and small molecules such as lipids, vitamins and hormones. The role and characteristics of enzymes must be covered.

Teachers are expected to show learners how to collect, collate and interpret qualitative and quantitative data to enable them to carry out investigations and to analyse the significance of the data for plants and animals and the ways in which they live.

Teachers must allow learners to study plants and animals drawn from across the Environmental and Land-based sector. The commercial significance of plants and animals to the enterprises using them must be clear, as must the importance of any commercial characteristics which link to the physiological or biochemical aspects of the plant/animal.

### Learning outcome 2

Learners must be taught how the commercial management of healthy plants and animals makes use of physiological and pathological sciences. Opportunities to study the ways in which commercial populations of plants and animals are managed by enterprises in the sector will show learners how these approaches work in practice and under commercial pressures.

Teachers must provide learners with knowledge of how animal and plant health is monitored and treated and the science behind common illnesses and diseases. The relationship between the symptoms of disease, its treatment, and the physiology or biochemistry of the plants/animals affected must be made clear. Learners are to be taught how techniques used in the field and in the laboratory provide physiological or biochemical evidence of healthy or diseased plants and animals. The changes to the physiology or biochemistry of plants and animals following treatment for diseases must be covered.

Learners must know how our scientific understanding of plants and animals is developed. Teaching must cover how and why empirical evidence is at the centre of best research practice, and the significance of peer review of research findings. Learners must be made aware of the value of live animal and plant research and evaluate the claims made for and against it.

Learners must be encouraged to understand and evaluate the ethical perspectives of using live plants and animals in research. In addition, learners must be made aware of developments in non-intrusive research methods and how developments in this area are influencing thinking in applied animal and plant science.

### **Learning outcome 3**

The different commercial ways of controlling the health, growth and development of plants and animals in wild populations and in managed populations must be covered. Teachers are to provide learners with an understanding that control of environmental factors affecting these populations is different in wild populations from that in the more 'managed' populations, such as herds of cows or glasshouses of crops. Learners must know that the wild state brings unique challenges for managers seeking to control them commercially.

Learners must be taught that the management strategies for feeding, growth and disease control of plants and animals living wild requires a sophisticated understanding of the position of the plants and animals in their natural feeding and energy webs. Learners must be able to contrast this with the relatively straightforward approaches to caring for populations of domesticated animals and managed communities of plants. The biotic and abiotic approaches used by Environmental and Land-based enterprises in managing some common wild populations of plants and animals must be known.

### **Learning outcome 4**

Teachers must provide an opportunity for learners to investigate how living conditions affect plants and animals in both wild and managed environments. Learners must undertake evaluations of how the physical and environmental elements of effective welfare and care strategies used by Environmental and Land-based enterprises affect the ways in which wild and managed populations of plants and animals grow, develop and reproduce.

Coverage must also include evaluations of the status of animal and plant populations (wild and managed) and comparisons of the ways in which interventions by those charged with their care and welfare maintain the populations' health and welfare.

In their investigations, learners must have the opportunity to evaluate proposed interventions in terms of the reasons for them, the biotic and abiotic scientific principles behind them, and their implementation and effectiveness, as well as to validate future intervention plans.

## Assessment

This unit is assessed through a centre set and marked assignment. Internal assessments are subject to moderation by AQA-City & Guilds.

Learners will be expected to conduct scientific investigations into plants and animals to monitor the effects of factors that affect their growth and development for an Environmental and Land-based enterprise. The assignment will require learners to apply their learning to commercial approaches to production, evaluate physiological evidence and develop and undertake a convincing and coherent monitoring programme.

The assignment will require learners to plan a growth and development programme to take account of the significant factors that could affect a selected plant and animal. Learners will be expected to monitor the factors affecting the growth and development of the plant and the animal in an Environmental and Land-based enterprise and conclude with recommendations for future practice.

### Task setting

Internal assessments must aim to be holistic in nature and encourage learners to produce evidence to cover the Assessment criteria.

This assignment will allow a flexible approach to allow learners to undertake the practical assignment in a range of suitable habitats and for consortia to make best use of local and accessible venues and organisations.

The assignment set must cover the tasks as set out in the table below.

Task	Form(s) of evidence	LO mapping
Plan for a growth and development programme	The following must be provided: <ul style="list-style-type: none"><li>descriptions of the basic structures and functions of the plant and animal</li><li>records of the scientific approaches and techniques used in determining these structures</li><li>description of the factors that may affect the management of the plant and animal</li><li>planning document</li></ul>	LO1, 2, 3
Monitoring of factors affecting growth and development	The following must be provided: <ul style="list-style-type: none"><li>laboratory records</li><li>data records from monitoring</li><li>witness statements of monitoring</li></ul>	LO2, 3, 4
Evaluation of programme	The following must be provided: <ul style="list-style-type: none"><li>presentation of report, written or oral, of conclusions from, and actions required by, the monitoring programme</li></ul>	LO4

## Duration

This unit has 60 GLH assigned to it, of which 9 hours will be needed for the assessment.

The assessment is not time constrained. The following is a guide to appropriate times for the activities:

Practical research to identify factors – 3 hours

Monitoring the factors – 4 hours

Preparation and presentation of report – 2 hours

If an oral presentation is selected, it should be no longer than approximately 15 minutes in length.

## Sector relevant purpose

The assignment is designed for learners to consider the commercial importance of assessing two new varieties that an Environmental and Land-based enterprise plans to develop (one plant and one animal). The learner will need to identify possible environmental and physical barriers to the success of developing these species and monitor their development to conclude their viability.

## Demand

The report must be presented as a formal scientific report and should be directed at senior representatives of the owners of the environments selected for comparison.

The report may be in any format (eg PowerPoint, written report, oral report) aimed at the owner of the environment.

## Task taking

Details of other controls that should be applied during the taking of the assessment tasks are set out on pages 114–116 of the specification.

## Weighting of Learning outcomes

Learning outcomes	Marks	Weighting
1 Know the major structures, functions and systems of plants and animals	18	20%
2 Know how science supports the management of plants and animals	18	20%
3 Understand the interrelationships between plants and animals	18	20%
4 Be able to conduct scientific investigations into plants and animals	36	40%
<b>Total</b>	<b>90</b>	<b>100%</b>

## Assessment grid

Please note that the descriptions in this marking grid relate to the top of each band. Further guidance on using marking grids is available in the Assessment section of this specification.

Learning outcomes	Band 1	Band 2	Band 3
	The learner has:		
	0 to 6 marks	7 to 12 marks	13 to 18 marks
1 Know the major structures, functions and systems of plants and animals	Briefly described the basic structures and physiological functions of the components of a plant.  Briefly described the basic structure and functions of the biological systems in an animal.	Described the basic structures and physiological functions of the components of a plant.  Described the basic structure and functions of the biological systems in an animal.	Described in detail the basic structures and physiological functions of the components of a plant.  Described in detail the basic structure and functions of the biological systems in an animal.
	0 to 6 marks	7 to 12 marks	13 to 18 marks
2 Know how science supports the management of plants and animals	Briefly explained how the principles of plant and animal physiology relate to the management of populations.  Explained partially relevant laboratory and scientific techniques used to manage plant and animal populations.	Explained how the principles of plant and animal physiology relate to the management of populations.  Explained relevant laboratory and scientific techniques used to manage plant and animal populations.	Comprehensively explained how the principles of plant and animal physiology relate to the management of populations.  Explained in detail relevant laboratory and scientific techniques used to manage plant and animal populations.
	0 to 6 marks	7 to 12 marks	13 to 18 marks
3 Understand the interrelationships between plants and animals	Partially explained how plants and animals live and interrelate in natural and managed environments.	Explained how plants and animals live and interrelate in natural and managed environments.	Explained in detail how plants and animals live and interrelate in natural and managed environments.
	0 to 12 marks	13 to 24 marks	25 to 36 marks
4 Be able to conduct scientific investigations into plants and animals	Briefly evaluated the physical and environmental factors that affect the growth and reproduction of a plant and an animal in their natural or managed environment.  Briefly identified the ways in which plants and animals live and interrelate the natural or managed environment.  Sporadically monitored some effects of biotic or abiotic factors on a plant and an animal population.	Evaluated the physical and environmental factors that affect the growth and reproduction of a plant and an animal in their natural or managed environment.  Identified the ways in which plants and animals live and interrelate in the natural or managed environment.  Regularly monitored the effects of biotic or abiotic factors on a plant and an animal population.	Evaluated in detail the physical and environmental factors that affect the growth and reproduction of plant and an animal in their natural or managed environment.  Identified in detail the ways in which plants and animals live and interrelate in the natural or managed environment.  Monitored, according to a plan and in detail, the effects of biotic or abiotic factors on a plant and an animal population.

## Guidance for delivery

This unit looks at animal and plant structure and function from a scientific perspective.

It has been designed to enable learners to study the detailed physiology of plants and animals used in the Environmental and Land-based sector. The applied nature of the unit means that learners should have good levels of access to the organisms they are studying and be able to relate structure to function.

The choice of plants and animals to study is wide. Wherever possible it should include one flowering plant, one non-flowering plant and two vertebrates, one of which should be a mammal. In all cases the emphasis must be on how an organism's structures are adapted to carrying out essential life functions, as well as understanding why the organism is of interest to the sector. The choice of plants and animals should be made with health and safety obligations in mind.

Learners will be expected to interpret and analyse visual information gathered from a variety of sources. They will be required to prepare materials for microscopic examination and handle live and dead specimens. Learners should be encouraged to apply their skills of analysis, prediction and judgement to unfamiliar situations. For example, they could use their understanding of ruminant digestion to predict the digestive structure of related animals.

It should **not** be necessary to dissect vertebrate animals, although physical examination of some animal or plant organs could be undertaken.

The theme for the unit is 'plants and animals' which has links with Level 3 Unit 5: Plants, animals and humans: how they relate, and Level 3 Unit 6: Plants and animals: safe working practices and relevant legislation. This unit also links with Level 3 Unit 7: Sustainable management and development of resources. Some of the benefits of linking these units together are that a number of different teaching and learning strategies can be used to integrate them. This unit contributes to this theme by developing learners' understanding of the fundamental physical structures and processes in plants and animals that require levels of care, treatment and legislation to meet society's needs and to protect a sustainable future. The skills and techniques developed within this unit can be developed and further applied in Level 3 Unit 9: Research methodology, evaluation and environmental analysis.

## Opportunities for applied learning

There are widespread and significant opportunities for applied learning in this unit. The emphasis on investigating plants and animals means that learners can work directly with them. Learners could visit animal and crop farms where farmers offer practical opportunities for learners to examine their stock. In the same way, visits to fish farms, game-bird woods, equine stables, wildlife centres and forests offer opportunities to study the structure of organisms in situ.

The professionals working in these areas can help to supervise learners' assignment work and to provide formative feedback on their understanding. It may also be possible for learners to shadow workers to gain additional insights into the ways in which organisms live, grow and breed. These same professionals might be able to provide learners with information on real issues facing their industry to enable learners to analyse it and to propose and justify solutions. Learning benefits could be obtained because these professionals would be in a unique position to evaluate learners' solutions and to debate the feasibility of any proposals being made.

Other perspectives on the significance of plants and animals to the Environmental and Land-based sector can be gained through discussions with, and observations of, other professionals. For instance, the significance of cattle to the Environmental and Land-based sector can be appreciated through insights gained from producers of human food, pet food, pharmaceuticals and fertiliser, and other industrial enterprises in the sector.

## Personal, Learning and Thinking Skills

The list below is indicative of the way this unit supports the development of PLTS, as opposed to the achievement of PLTS that are possible through the assessment. The unit supports the development of more PLTS than are covered through the Assessment criteria alone.

Alternative approaches could be selected.

The learner could develop PLTS by:

### Independent enquirers

- considering when learning about issues, events or problems from different perspectives the significance of plants and animals to the Environmental and Land-based sector

### Team workers

- working in small groups, when carrying out practical activities sharing ideas and findings
- co-operating with and supporting other learners, showing fairness and consideration

### Self-managers

- organising themselves, and their time and resources, identifying the priorities of activities
- demonstrating flexibility when sharing ideas such as ways to manage plant and animal populations
- seeking advice and support when necessary.

## Opportunities for Functional Skills development

This unit and its associated learning activities will provide the learner with opportunities to develop and use English, mathematics and ICT in a number of ways.

This unit will require a high level of research which will also involve the interpretation of diagrams and charts used to explain the interrelationships between plants and animals. As a result of this research, the ability to write clearly and accurately about complex subjects, such as nutrition and its implications for the management of plant and animal populations, will provide opportunities to extend learners' writing skills.

If work for this unit is generated electronically, the learner will have the opportunity to develop skills and/or evidence for the Functional Skills in ICT.

## Suggested learning resources

### Books

Boyd, J. S.; Paterson, C. (2000). *Colour Atlas of Clinical Anatomy of the Dog and Cat*. Published: C.V. Mosby. ISBN: 978-0723431688.

Dallas, S. (2006). *Animal Biology and Care*. Published: Wiley Blackwell. ISBN: 978-1405137959.

Eckert, R; Randall, D. J.; Burggren, W; French, K. (2001). *Eckert: Animal Physiology*. Published: W. H. Freeman & Co Ltd. ISBN: 978-0716738633.

Campbell, J. R.; Douglas Kenealy, M.; Campbell, K. L. (2002). *Animal Sciences: The Biology, Care, and Production of Domestic Animals*: Published: McGraw-Hill Higher Education. ISBN: 998-0073661759.

Taiz, L.; Zeiger, E. (2006). *Plant Physiology*. Published: Sinauer Associates Inc. U.S. ISBN: 978-0878938568.

Raven, P. H.; Evert, R. F.; Eichhorn, S. E. (2005). *Biology of Plants*. Published: W. H. Freeman & Co Ltd. ISBN: 978-0716762843.

Rodwell, J. S. (Editor) (1998). *British Plant Communities Set of Volumes 1 to 5*. Published: Cambridge University Press. ISBN: 978-0521627214.

Dyce, K. M.; Sack, W. O.; Wensing, C. J. G. (2002). *Textbook of Veterinary Anatomy*. Published: Saunders. ISBN: 978-0721689661.

Fitter, H. A.; Hay, R. K. M. (2001). *Environmental Physiology of Plants*. Published: Academic Press. ISBN: 978-0122577666.

### CDs CD-ROMs and DVDs

- Mauseth, J. D. *An Introduction to Plant Biology*. CD-ROM (2003).
- Dimpleby, D. *A Picture of Britain*. DVD (2005).
- Clark, O. *Coast*. DVD (2005).
- Attenborough, D. *Planet Earth*. DVD (2006).
- Attenborough, D. *Life on Earth*. DVD (2003).
- Attenborough, D. *Blue Planet*. DVD (2005).
- Attenborough, D. *Life of Mammals*. DVD (2002).
- National Geographic. *Amazing Planet Box Set*. DVD (2008).

### Websites

- Department for Environment, Food & Rural Affairs [www.defra.gov.uk](http://www.defra.gov.uk)
- ADAS UK Ltd [www.adas.co.uk](http://www.adas.co.uk)
- The Wildlife Trusts [www.wildlifetrusts.org](http://www.wildlifetrusts.org)
- Environmental Agency [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)
- FSC (Field Studies Council) [www.field-studies-council.org](http://www.field-studies-council.org)
- Forestry Commission GB [www.forestry.gov.uk](http://www.forestry.gov.uk)
- Natural England [www.naturalengland.org.uk](http://www.naturalengland.org.uk)
- Royal Society <http://royalsociety.org>
- Natural Environment Research Council [www.nerc.ac.uk](http://www.nerc.ac.uk)
- RSPB [www.rspb.org.uk](http://www.rspb.org.uk)
- British Veterinary Nursing Association [www.bvna.org.uk](http://www.bvna.org.uk)
- Institute of Horticulture [www.horticulture.org.uk](http://www.horticulture.org.uk)
- The British Horse Society [www.bhs.org.uk](http://www.bhs.org.uk)
- Royal Botanic Gardens [www.kew.org](http://www.kew.org)

## Level 3 Unit 5: Plants, animals and humans: how they relate

### What is this unit about?

plants and animals contribute to our society in many different ways. This unit looks in detail at how the characteristics of domesticated and wild animals and wild and cultivated plants enable them to fulfil a range of roles in society.

The unit consider the economic value of plants and animals, as well as looking at the various ways in which plants and animals interrelate with us and contribute to different human activities. This will include their roles in the provision of a range of important products and services, as well as for companionship, and in recreation and tourism. The ways in which wild plants and animals contribute to our natural areas will also be covered.

Learners will evaluate how wide and varied use of plants and animals has developed and how their characteristics determine these uses and roles today. The cultural implications of using plants and animals are also important for ethical and humane reasons.

Learners will look at the extent to which some of these roles have expanded or declined over time, as well as changes in the range of Environmental and Land-based enterprises with commercial interests in this area.

We use some plants and animals in such considerable numbers that their production is a large commercial undertaking. There will be opportunities for learners to explore how commercial Environmental and Land-based organisations meet the market demands for plants and animals and how they ensure that these plants and animals are fit for purpose.

As there are so many uses of plants and animals by society, the impact they have on us and our environment needs to be managed. Learners will be able to consider how plants and animals affect our health, our environment and how society and commercial organisations with large-scale animal or plant businesses manage their waste and the pollution which arises.

This unit has particular emphasis for the following Personal, Learning and Thinking Skills (PLTS):

- creative thinkers
- team workers.

### Guided learning hours

This unit has 60 GLH assigned to it, of which 8 hours will be needed for the assessment. Details of specific controls needed in relation to the internal assessment are shown in the Assessment section of this unit. Overall information on controls is on pages 114–118 of this specification.

## Content details

Learning outcomes The learner will:	Assessment criteria The learner can:	PLTS
1 Understand the roles and uses of plants and animals in the human economy	a explain the significance of wild and cultivated plants to the economy, environment, human health and development	
	b explain the significance of wild and domesticated animals to the economy, the environment, human health and development	
2 Understand the social and ethical implications of using plants and animals	a explain the interdependency between plants, animals and humans in commercial development, recreation and conservation	
	b evaluate the implications for the environment of the commercial and recreational use of plants and animals	
	c evaluate the increasing pressure for conservation when up-scaling production systems	
3 Know the techniques used to manage the impact of pollution and waste	a describe the techniques used to prevent, monitor and manage pollution and waste	
4 Be able to propose strategies to minimise pollution and waste for an Environmental and Land-based enterprise	a carry out a pollution assessment with colleagues	TW1
	b conduct a waste management system analysis	
	c evaluate the impact of pollution and waste from of an Environmental and Land-based enterprise from data collected	
	d generate ideas to minimise pollution and waste	CT1
	e propose a strategy for pollution and waste management for an Environmental and Land-based enterprise	

Where the Assessment criteria show a direct link to an area of the PLTS framework, it is referenced here. Further information on PLTS is available on pages 10–12 of the specification and also within this unit in the section on Personal, Learning and Thinking Skills.

## Scope of content

This section gives details of the scope of content to be covered in the teaching of this unit, to ensure that all the Learning outcomes can be met. This includes examples relating to breadth and depth where applicable.

It is important that, through the Level 3 Principal Learning in Environmental and Land-based Studies, learners receive as broad an experience of the whole sector as possible. Teachers are urged to refer to, and use examples from, appropriate industries where relevant. Details of these industries may be found on page 15 of the specification.

### Learning outcome 1

Learners must develop a full understanding of the range and significance of the contributions made by wild and cultivated plants and wild and domesticated animals to our society. The importance of plants and animals to society's current and future industrial and commercial activities, to its environmental obligations and to the health of its citizens must be covered. This will include the roles of plants and animals in human, animal and plant food production, materials and textiles, medicine and energy production, as well as examples of work carried out by animals directly.

In addition, learners must understand that plants and animals are central to how we maintain and improve our wild and managed environments, are part of our recreational and leisure areas and activities, are used to improve our understanding of the natural world, and are used in sport, science and technology as well as in breed and product development. The aesthetic qualities and companionship roles of some plants and animals must also be covered.

### Learning outcome 2

Learners must understand how using plants and animal raises important welfare, safety, social and ethical obligations and responsibilities for those that use them. The contentious issues around the humane use of higher order animals such as mammals, reptiles, fish, birds and amphibians must be covered. The ways in which plants and animals are interrelated in natural habits and the implications for the balance of the habitat of using plants and animals should be clear.

Comparisons between the obligations and responsibilities of individuals and commercial enterprises using plants or animals must be addressed. The welfare, safety, social and ethical obligations and responsibilities of businesses using plants and animals must be considered and must include analysis of the implications for conservation and sustainable development of strong and weak business practices. The ways in which working with plants and animals changes as enterprises develop their activities to commercial levels of productivity must be considered. The ways in which conservation strategies use plants and animals must also be clear.

### Learning outcome 3

Learning must include the ways in which the operational activities of commercial businesses that use plants and animals affect the environment in which these activities take place. Learners must be aware of how both large-scale commercial businesses and smaller-scale recreational enterprises manage their impact on the environment by responsible sourcing of plants/animals, by adopting best working practices and by minimising the release of waste and other contributors to pollution.

Learners must know how the commercial assessment of animal and plant waste is carried out and the industry-standard techniques used to minimise this waste.

### Learning outcome 4

Learners must be aware of how to audit and propose improvements, where necessary, to the ways in which an Environmental and Land-based enterprise manages its waste levels and pollution.

Learning must cover how to carry out a reliable pollution assessment of an enterprise, how to analyse its waste management strategy, and from these investigations how to evaluate the impact of the business on the surroundings in which it operates. Learners are expected to be able to use appropriate analytical skills to evaluate findings from investigations. They must cover how to propose, justify and blend ideas to make improvements that are staged into an effective and viable strategy that takes full account of the commercial standing of the business.

## Assessment

This unit is assessed through a centre set and marked assignment. Internal assessments are subject to moderation by AQA-City & Guilds.

Learners will be expected to produce a product introduction and development strategy for a business, which is based on sound scientific, ethical and commercial principles and is achievable, affordable and effective. This assignment will require learners to apply their learning to a commercial issue, evaluate evidence and develop and defend a convincing and coherent case. The introduction of the product will need to take account of roles, economic significance and environmental considerations. Aspects of pollution and waste and how they can be minimised must be included and the assessment of pollution must be carried out as a team activity.

The assignment will also call for the learner to evaluate their research and presentation and to obtain suggestions on where their business strategy could be improved.

### Task setting

Internal assessments must aim to be holistic in nature and encourage learners to produce evidence to cover the Assessment criteria.

The assignment set must cover the tasks as set out in the table below.

Task	Form(s) of evidence	LO mapping
Production of a product introduction and development strategy for a business	The following must be provided: <ul style="list-style-type: none"><li>records of research</li><li>presentation of the strategy</li><li>any supporting data used</li></ul>	LO1, 2, 3 and 4
Assessment of pollution and waste	The following must be provided: <ul style="list-style-type: none"><li>records of research</li><li>presentation of the strategy</li><li>any supporting data used</li></ul>	LO3 and 4
Evaluation of business strategy	The following must be provided: <ul style="list-style-type: none"><li>report on recommendations and review in light of feedback</li></ul>	LO4

### Duration

The assessment is not time constrained. The following is a guide to appropriate times for the assessment activities:

Business strategy development (including pollution assessment) – 5 hours

Presentation of the business strategy – no longer than 10 minutes  
(with 1 hour for development)

Evaluation report of business strategy – 2 hours.

### Demand

The assessment of pollution must be carried out as a team activity.

The strategy and presentation are aimed at the senior management of the business.

## Task taking

Details of controls that should be applied during the taking of the assessment tasks are set out on pages 114–116 of the specification.

## Weighting of Learning outcomes

Learning outcomes	Marks	Weighting
1 Understand the roles and uses of plants and animals in the human economy	18	20%
2 Understand the social and ethical implications of using plants and animals	18	20%
3 Know the techniques used to manage the impact of pollution and waste	18	20%
4 Be able to propose strategies to minimise pollution and waste for an Environmental and Land-based enterprise	36	40%
<b>Total</b>	<b>90</b>	<b>100%</b>

## Assessment grid

Please note that the descriptions in this marking grid relate to the top of each band. Further guidance on using marking grids is available in the Assessment section of this specification.

Learning outcomes	Band 1	Band 2	Band 3
	The learner has:		
	0 to 6 marks	7 to 12 marks	13 to 18 marks
1 Understand the roles and uses of plants and animals in the human economy	<p>Briefly explained the significance of wild and cultivated plants to the economy, the environment and human health and development.</p> <p>Briefly explained the significance of wild and domesticated animals to the economy, the environment and human health and development.</p>	<p>Explained the significance of wild and cultivated plants to the economy, the environment and human health and development.</p> <p>Explained the significance of wild and domesticated animals to the economy, the environment and human health and development.</p>	<p>Comprehensively explained the significance of wild and cultivated plants to the economy, the environment and human health and development.</p> <p>Comprehensively explained the significance of wild and domesticated animals to the economy, the environment and human health and development.</p>
	0 to 6 marks	7 to 12 marks	13 to 18 marks
2 The social and ethical implications of using plants and animals	<p>Briefly explained the interdependency between humans and plants and/or animals.</p> <p>Partially evaluated the implications for the environment of the commercial and recreational use of plants and animals.</p> <p>Partially evaluated the increasing pressure for conservation when up-scaling production systems.</p>	<p>Explained the inter-dependency between humans and plants and/or animals.</p> <p>Evaluated the implications for the environment of the commercial and recreational use of plants and animals.</p> <p>Evaluated the increasing pressure for conservation when up-scaling production systems.</p>	<p>Explained comprehensively the inter-dependency between humans and plants and/or animals.</p> <p>Fully evaluated the implications for the environment of the commercial and recreational use of plants and animals.</p> <p>Fully evaluated the increasing pressure for conservation when up-scaling production systems.</p>
	0 to 6 marks	7 to 12 marks	13 to 18 marks
3 The techniques used to manage the impact of pollution and waste	Described the techniques used to prevent or monitor or manage pollution and waste.	Described the techniques used to prevent, monitor and manage pollution and waste.	Fully described a good range of techniques used to prevent, monitor and manage pollution and waste.

## Assessment grid (continued)

Learning outcomes	Band 1	Band 2	Band 3
	The learner has:		
	0 to 12 marks	13 to 24 marks	25 to 36 marks
4 Be able to propose strategies to minimise pollution and waste for an Environmental and Land-based enterprise	<p>Made a significant contribution to carrying out a pollution assessment with colleagues making a limited contribution.</p> <p>Conducted a limited analysis of aspects of waste management system.</p> <p>Evaluated some of the impact of pollution and waste from an Environmental and Land-based enterprise, using limited collected data.</p> <p>Generated some ideas to minimise pollution or waste.</p> <p>Proposed a basic strategy for waste or pollution management for an Environmental and Land-based enterprise.</p>	<p>Made a significant contribution to carrying out a pollution assessment with colleagues making a satisfactory contribution.</p> <p>Conducted an analysis of a waste management system.</p> <p>Evaluated the basic impact of pollution and waste from an Environmental and Land-based enterprise, using collected data.</p> <p>Generated ideas to minimise pollution and waste.</p> <p>Proposed a strategy for pollution and waste management for an Environmental and Land-based enterprise.</p>	<p>Made a significant contribution to carrying out an accurate and comprehensive pollution assessment with colleagues.</p> <p>Conducted a comprehensive analysis of a waste management system.</p> <p>Evaluated, in detail, the impacts of pollution and waste from an Environmental and Land-based enterprise, using comprehensive collected data.</p> <p>Generated a good range of viable ideas to minimise clearly specified pollution and waste.</p> <p>Proposed a viable and appropriate strategy for comprehensive pollution and waste management for an Environmental and Land-based enterprise.</p>

## Guidance for delivery

This is an active learning unit which requires learners to have opportunities to examine plant and animal relationships to society. It is important that learners should be able to visit various different locations to enable them to develop an understanding of the role of plants and animals in society, and to gain an active appreciation of the interactions between species of plants and animals.

Learners should be given ample opportunity to observe how domestic species interact with their environment, particularly where the species in question are likely to encounter other species of animal and plant as food or predator. Learners should have the opportunity to assess plants and animals used by society for their suitability or use. It is anticipated that this will require learners to visit a livestock-producing farm and, if possible, a livestock market. Learners would benefit from access to working dogs and a range of animals considered suitable as domestic pets. Learners will also benefit from access to food plant producers, such as an arable farm or grower.

In order to devise a waste management plan, learners should work in groups so that visits to a commercial business can be structured and organised by the teacher. The business chosen should be able to satisfy all the Assessment criteria listed, and all the information required for the assessment should be derived from the business visited. The teacher should give each group an indication of the pollution and waste they are likely to find in each business.

The theme for the unit is 'plants and animals'. This unit contributes to this theme by exploring the role of plants and animals in society for food, recreation and tourism, with consideration for the impacts of humanity on the environment.

This unit has links with Level 3 Unit 4: Plants and animals: applied science, and Level 3 Unit 6: Plants and animals: safe working practices and relevant legislation. Benefits can be obtained by using appropriate teaching and learning strategies such as co-teaching and using knowledge gained from consolidating the theme, with each unit supporting the learning and understanding of the others.

## Opportunities for applied learning

Learners will be able to apply the skills and knowledge gained by this unit by:

- undertaking an environmental audit
- undertaking pollution control assessment
- developing skills to collate data into a report using IT
- using resources to influence the development of a management plan
- using discussion techniques with an employer to extract the correct information
- considering of the differing influences of commercial business and cultural and/or ethical values
- co-operating with others to gather information.

## Suggested prior learning

This unit should require no specific prior learning; however, learners will be able to apply knowledge gained from previous study of Geography and Science in the development of key principles. Learners would benefit from having completed the Higher Diploma in Environmental and Land-based Studies.

## Personal, Learning and Thinking Skills

The list below is indicative of the way this unit supports the development of PLTS, as opposed to the achievement of PLTS that are possible through the assessment. The unit supports the development of more PLTS than are covered through the Assessment criteria alone.

Alternative approaches could be selected.

The learner could develop PLTS by:

### Independent enquirers

- analysing and evaluating information relating to the implications for the environment of the commercial and recreational use of plants and animals

### Creative thinkers

- generating ideas when devising a pollution management plan

### Reflective learners

- evaluating different ethical concepts and needs to inform the management plan

### Team workers

- co-operating with others to ensure a balanced approach is taken when carrying out the pollution assessment

### Self-managers

- carefully planning time and resources when devising the management plan

### Effective participators

- acting as an advocate when considering the differing views relating to the cultural and ethical impact on commercial enterprises.

## Opportunities for Functional Skills development

This unit and its associated learning activities will provide the learner with opportunities to develop and use English, mathematics and ICT in a number of ways.

This is very much an investigative unit providing a range of reading skills development activities. The outcomes, comprising a report and a business plan, offer opportunities for learners to develop accurate writing skills in a variety of formats.

If work for this unit is generated electronically, the learner will have the opportunity to develop skills and/or evidence for the Functional Skills in ICT.

## Suggested learning resources

### Books

Soffe, R.; (Editor) (2005). *The Countryside Notebook*. Published: Wiley-Blackwell. ISBN: 978-1405112314.

Soffe, R.; (Editor) (2003). *The Agricultural Notebook*. Published: Wiley-Blackwell. ISBN: 978-0632058297.

(2006). *Dictionary of Agriculture*. Published: A & C Black Publishers Ltd. ISBN: 978-0713677782.

Eckert, R.; Randall, D. J.; Burggren, W.; French, K. (2001). *Eckert: Animal Physiology*.

Published: W. H. Freeman & Co Ltd. ISBN: 978-0716738633.

Campbell, J. R.; Douglas Kenealy (2002). *Animal Sciences: The Biology, Care, and Production of Domestic Animals*. Published: McGraw-Hill Higher Education. ISBN: 978-0073661759.

Raven, P. H.; Evert, R. F.; Eichhorn, S. E. (2005). *Biology of Plants*. Published: W. H. Freeman & Co Ltd.

ISBN: 978-0716762843.

Rodwell, J. S. (Editor) (1998). *British Plant Communities Set of Volumes 1 to 5*.

Published: Cambridge University Press. ISBN: 978-0521627214.

Fitter, H. A.; Hay, R. K. M (2001). *Environmental Physiology of Plants*. Published: Academic Press.

ISBN: 978-0122577666.

Adams, C. R.; Bamford, K. M.; Early, M. P. (2008). *Principles of Horticulture*.

Published: Butterworth-Heinemann Ltd. ISBN: 978-0750686945.

Warren, D. (2001). *Small Animal Care and Management*. Published: Delmar Learning.

ISBN: 978-0766814240.

### Websites

- Department for Environment, Food & Rural Affairs [www.defra.gov.uk](http://www.defra.gov.uk)
- ADAS UK Ltd [www.adas.co.uk](http://www.adas.co.uk)
- The Wildlife Trusts [www.wildlifetrusts.org](http://www.wildlifetrusts.org)
- Environmental Agency [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)
- FSC (Field Studies Council) [www.field-studies-council.org](http://www.field-studies-council.org)
- Forestry Commission GB [www.forestry.gov.uk](http://www.forestry.gov.uk)
- BTCV [www2.btcv.org.uk](http://www2.btcv.org.uk)
- Natural England [www.naturalengland.org.uk](http://www.naturalengland.org.uk)
- Royal society <http://royalsociety.org>
- Chartered Institution of Wastes Management [www.ciwm.co.uk](http://www.ciwm.co.uk)
- Soil Association [www.soilassociation.org](http://www.soilassociation.org)
- The National Science Digital Library <http://nsdl.org>
- Natural Environment Research Council [www.nerc.ac.uk](http://www.nerc.ac.uk)

## Level 3 Unit 6: Plants and animals: safe working practices and relevant legislation

### What is this unit about?

Working safely with plants and animals is important to them and to us. The Environmental and Land-based sector has to manage hazardous activities carefully and to use practices and procedures that minimise the risk to employees and to the living organisms with which they work. Business success, product quality and job satisfaction depend on having the right approaches to safety in place and developing reliable monitoring and evaluation systems which put health and safety at the centre of best business practice.

In this unit, learners will reflect on the risks faced by organisations working in the Environmental and Land-based sector. They will consider the nature, and the scale and prevalence of the threats posed to businesses by a variety of common risks. Many of these risks will be common to industries within and outside the Environmental and Land-based sector. The unit will look at how systems to minimise risk are developed, implemented and monitored and how enterprises with the right policies and operational systems can use them to their commercial advantage.

As the unit considers the working practices in a range of Environmental and Land-based organisations, it should stimulate learners' interest and enthusiasm for the industries themselves and provide them with insights into careers in this important aspect of work.

This unit is designed so that it will link learners to large and small businesses in the sector and give them an opportunity to discuss problems and issues which occur on a regular basis, such as how to minimise losses in the food or plant chain or what steps are taken to avoid outbreaks of disease.

This unit has particular emphasis for the following Personal, Learning and Thinking Skills (PLTS):

- reflective learners
- effective participators.

### Guided learning hours

This unit has 60 GLH assigned to it, which includes any time needed for assessment preparation. Learners will sit an examination lasting 3 hours.

## Content details

Learning outcomes The learner will:	Assessment criteria The learner can:	PLTS
1 Know the legislation and agencies that support safe working practices	a describe the legal responsibilities for Health and Safety in the workplace	
	b outline legislation and planning for safe working with plants and animals	
	c describe the roles of statutory and non-statutory agencies in respect of safe and legal working	
2 Understand the importance of safe working practices	a justify the use of safety audits on Environmental and Land-based enterprises	
	b evaluate potential hazardous situations that may occur in the operation of Environmental and Land-based enterprises	
3 Understand how systems support safe working practices with plants and animals	a analyse the requirements for organisations when transporting and handling plants and animals and their products	
	b appraise the purposes of tracking, tracing and regulating of supplies	
	c evaluate the effectiveness of mechanisms to prevent and manage diseases in plants and animals	
4 Be able to assess the safe operation of Environmental and Land-based organisations	a evaluate the implementation of the legal responsibilities for health, welfare and safety in workplace operations	
	b review the operation of Environmental and Land-based organisations	RL3
	c make recommendations for future compliance	EP4

Where the Assessment criteria show a direct link to an area of the PLTS framework, it is referenced here. Further information on PLTS is available on pages 10–12 of the specification and also within this unit in the section on Personal, Learning and Thinking Skills.

## Scope of content

This section gives details of the scope of content to be covered in the teaching of this unit, to ensure that all the Learning outcomes can be met. This includes examples relating to breadth and depth where applicable.

It is important that, through the Level 3 Principal Learning in Environmental and Land-based Studies, learners receive as broad an experience of the whole sector as possible. Teachers are urged to refer to and use examples from, appropriate industries where relevant. Details of these industries may be found on page 15 of the specification.

### Learning outcome 1

Teachers must make learners aware of recent case studies of incidents (accidents, diseases, illnesses, welfare problems and hazardous situations) which have occurred in a broad range of industries. The incidents, which could be of local or national significance, should be used to illustrate risks and the subsequent development of safety audits and risk assessments.

The meaning of hazards and risks will be an essential element to gaining a fuller understanding of the more detailed aspects of the unit. The importance of businesses, however large or small, carrying out regular safety audits or risk assessments must be emphasised.

In this Learning outcome, learners will be taught how to complete a safety audit and a risk assessment. It would be advantageous if the subsequent information could be gathered from 'live' incidents such that the relevant safety policy or procedure can be reviewed and revised. It is important that the policy or procedure is reviewed in conjunction with a supervisor or manager who is familiar with the work involved and can provide constructive feedback to the learner so that any relevant implications are considered.

### Learning outcome 2

This Learning outcome focuses upon the roles of statutory and non-statutory agencies. These will relate to specific industries within the sector which should be chosen according to learner interest. The legal obligations for employers and employees currently in place to protect themselves, the plants and animals in their care and the customer are an important aspect of this unit. Teachers must make learners aware of the various responsibilities of the Health and Safety at Work Act and the responsibility for a duty of care to themselves and others. Learners should also see how these are put into practice within a workplace and, in particular, any specific areas that apply to certain industries eg safe use of pesticides, safe use of chainsaws and assurance schemes. Learners will also need to understand the needs of wild and domestic animals in terms of care and welfare.

Teachers must also ensure that learners are able to research current and appropriate legislation, how businesses need to conform to it and how they are made aware of the roles and responsibilities in respect of safe and legal working, of the following government agencies:

- Department for Environment, Food and Rural Affairs
- Food Standards Agency
- Health and Safety Executive.

### Learning outcome 3

Learners must be given an understanding of the systems that are used by businesses and their products in the industry to support safe working practices that involve the following:

- Legislation and planning requirements for the import and export of plants and animals (including wild animals so that the legislation involved in importing and exporting for zoos and animal parks are taught). Teachers must make learners aware of the many and varied movements of a range of businesses in the sector and their products eg competition animals and endangered species. This will involve gaining an understanding of CITES (Convention on the International Trade in Endangered Species of wild Fauna and Flora).

- Traceability and movements of plants and animals and their products which will include food preparation. These have been developed by the Food Standards Agency to protect the interest of consumers in relation to food and are continually being reviewed. Learners must understand that many manufacturing systems, including food manufacturing are registered to ISO Quality Standards. There is also a need to include farm assurance schemes which requires some level of traceability to be in place within primary production.
- Mechanisms to prevent diseases and illness and the procedures to manage disease outbreaks and, in particular, the transfer processes of disease.

### **Learning outcome 4**

Teachers must give learners the opportunity to assess an Environmental and Land-based organisation's operations and then be able to make recommendations to improve safe working.

Learners must also know how to evaluate the implementation of the legal responsibilities for health, welfare and safety in workplace operations and review operations of Environmental and Land-based organisations to comply with legislation in future working processes.

## Assessment

This unit is assessed externally through an examination set and marked by AQA-City & Guilds.

Learners will take a written examination lasting 3 hours, the purpose of which is to assess the learner's achievement of the Learning outcomes as indicated in the examination specification shown below.

The examination will be assessed using structured questions.

## Examination specification

Duration: 3 hours

Assessment type: Written test

Number of marks: 90

Learning outcomes	Assessment criteria	Marks	Weighting
1 Know the legislation and agencies that support safe working practices	a describe the legal responsibilities for Health and Safety in the workplace	24	26.7%
	b outline legislation and planning for safe working with plants and animals		
	c describe the roles of statutory and non-statutory agencies in respect of safe and legal working		
2 Understand the importance of safe working practices	a justify the use of safety audits on Environmental and Land-based enterprises	18	20%
	b evaluate potential hazardous situations that may occur in the operation of Environmental and Land-based enterprises		
3 Understand how systems support safe working practices with plants and animals	a analyse the requirements for organisations when transporting and handling plants and animals and their products	20	22.2%
	b appraise the purposes of tracking, tracing and regulating supplies		
	c evaluate the effectiveness of mechanisms to prevent and manage diseases in plants and animals		
4 Be able to assess the safe operation of Environmental and Land-based organisations	a evaluate the implementation of the legal responsibilities for health, welfare and safety in workplace operations	28	31.1%
	b review the operation of Environmental and Land-based organisations		
	c make recommendations for future compliance		
<b>Total</b>		<b>90</b>	<b>100%</b>

## Guidance for delivery

Wherever possible, links with local businesses and support services, eg health and safety officers or representatives of the veterinary and plants inspectorate, should be established to enable learners to integrate practical and industrial relevance with theoretical knowledge. Learners should be encouraged to apply the theory of safe working practices and awareness of health and safety risks to practical tasks and real-life sector-related situations. They should have access to safety policies and procedures which are related to 'real' incidents.

Visits to relevant local businesses are encouraged to enable learners to meet with quality managers and to gain knowledge of quality control procedures, traceability of products, movement controls on plants and animals, legal obligations, and health and safety issues.

Ideally, a discussion environment should be created in order that learners can evaluate how specific enterprises respond to the incidence of accidents, diseases, illnesses, welfare problems and hazardous situations with reference to wild and domesticated animals and wild and cultivated plants. The differing views from employers and employees across the sector should enable learners to improve their understanding and knowledge. Contributions should be sought from relevant external groups or individuals whenever possible. This activity will also enable the learners to appreciate a range of viewpoints and important issues that currently surround the industry.

This unit will give learners an insight into the roles and responsibilities of individuals in a range of different businesses and it will provide opportunities for learners to review their career options.

The theme for the unit is 'plants and animals'. This unit contributes to this theme by focusing on the management aspects of the workplace and, in particular, the specific legislation and legal obligations that face the industry. It also covers a wider viewpoint when considering the movement of plants and animals through a food chain. The unit has been designed such that current topics can be discussed openly by learners with members of industry.

This unit has links with Level 3 Unit 4: Plants and animals: applied science, and Level 3 Unit 5: Plants, animals and humans: how they relate. Benefits can be obtained by using a number of different teaching and learning strategies which will integrate the units eg through co-teaching, and/or using the information and data obtained from this unit as the basis for further work in a single purposeful activity.

## Opportunities for applied learning

Learners will be able to apply the skills and knowledge gained in this unit by:

- investigating appropriate businesses and career opportunities within the sector
- receiving input from small and large businesses to widen knowledge of a particular industry or area
- participating in group discussion and considering different views
- investigating traceability data for a plant or animal (this should involve the use of IT)
- undertaking safety audits and risk assessments in relation to an Environmental and Land-based businesses and enterprises
- reviewing and revising safety policies
- undertaking appropriate and relevant industrial experience
- participating in group discussions relating to current incidents in the news
- investigating legislation involving EU and Government organisations.

## Suggested prior learning

Learners should be familiar with a range of Environmental and Land-based industries. Learners would benefit from having studied Level 2 Unit 5: Plants and animals: their role in society, prior to this unit. GCSE Land and Environment or a relevant long Level 2 programme in an Environmental and Land-based subject would also provide learners with a solid grounding for this unit.

## Personal, Learning and Thinking Skills

The list below is indicative of the way this unit supports the development of PLTS, as opposed to the achievement of PLTS that are possible through the assessment. The unit supports the development of more PLTS than are covered through the Assessment criteria alone.

Alternative approaches could be selected.

The learner could develop PLTS by:

### Independent enquirers

- analysing data to monitor movements of plants and animals in order to evaluate quality issues
- reviewing incidents that have occurred in the workplace and considering whether the relevant safety policy needs to be revised

### Creative thinkers

- producing a safety audit and adapting a health and safety policy as circumstances change
- evaluating the potential for accidents, diseases, welfare problems and hazardous situations to occur

### Reflective learners

- inviting feedback from a supervisor or manager regarding their revised safety policy
- listening to other learners as they describe the typical accidents and issues that they have found in the businesses they visited

### Team workers

- co-operating with others to work towards common goals whilst collecting case study data
- reaching agreement and managing relevant discussions when revising a health and safety policy

### Self-managers

- anticipating and managing risk whilst carrying out a risk assessment
- organising time whilst discussing issues with personnel of a large business, ensuring that relevant questions are prioritised before the visit

### Effective participators

- identifying improvements to benefit others when revising or developing health and safety policies
- explaining the tracking and tracing of plants and animal products, breaking them down into logical, sequential steps.

## Opportunities for Functional Skills development

This unit and its associated learning activities will provide the learner with opportunities to develop and use English, mathematics and ICT in a number of ways.

Reading and understanding complex information about important subjects such as the law relating to the care and management of animals is a significant feature of this unit and provides opportunities for reading skills development. Furthermore, it is not only the understanding of such legal requirements but also the translation of them into practical and safe working practices which afford opportunities to develop learners' writing skills.

If work for this unit is generated electronically, the learner will have the opportunity to develop skills and/or evidence for the Functional Skills in ICT.

## Suggested learning resources

### Books

- Adams, C. R.; Early, M. P. (2008). *Principles of Horticulture*. Published: Butterworth-Heinemann. ISBN: 978-0750686945.
- Dawson, P. (2006). *A Handbook for Horticultural Students*. Published: Dawson (Peter). ISBN: 978-0952591115.
- Winter, M. (1996). *Rural Politics: Policies for Agriculture, Forestry and the Environment*. Published: Routledge. ISBN: 978-0415081764.
- Pretty, J. N. (2005). *The Pesticide Detox: Towards a More Sustainable Agriculture*. Published: Earthscan Ltd. ISBN: 978-1844071425.
- Madeley, J. (2002). *Food for all – The Need for a New Agriculture*. Published: Zed Books. ISBN: 978-1842770191.
- Hughes, P. (2007). *Introduction to Health and Safety at work*. Published: Butterworth-Heinemann Ltd. ISBN: 978-0750685030.
- HSE. (2000) *Management of Health and Safety at Work*. Published: Health and Safety Executive. ISBN: 978-0717624881.
- HSE. (1997) *Successful Health and Safety Management*. Published: Health and Safety Executive. ISBN: 978-0717612765.
- Boulakis M. Weightman P. W. H. *Food supply chain management*. Published: WileyBlackwell. ISBN: 978-1405101684.
- Warren, D. *Small animal care and management*. Published: Delmar Learning. ISBN: 978-0766814240.

### Websites

- Department for Environment, Food & Rural Affairs [www.defra.gov.uk](http://www.defra.gov.uk)
- ADAS UK Ltd [www.adas.co.uk](http://www.adas.co.uk)
- The Wildlife Trusts [www.wildlifetrusts.org](http://www.wildlifetrusts.org)
- Environmental Agency [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)
- FSC (Field Studies Council) [www.field-studies-council.org](http://www.field-studies-council.org)
- Forestry Commission GB [www.forestry.gov.uk](http://www.forestry.gov.uk)
- BTCV [www2.btcv.org.uk](http://www2.btcv.org.uk)
- RSPB [www.rspb.org.uk](http://www.rspb.org.uk)
- Natural England [www.naturalongland.org.uk](http://www.naturalongland.org.uk)

# Level 3 Unit 7: Sustainable management and development of resources

## What is this unit about?

The global need to balance finite resources with the requirements of growing world populations in sustainable ways is an international concern. It raises important and difficult ethical, commercial and environmental issues for individuals, businesses and governments.

If appropriate and responsible use of these limited resources is to be made, enterprises and governments must work out how they can ensure the long-term availability of these resources. At the same time, it must be recognised that citizens have needs and claims to be free to use them to create wealth and opportunities for themselves and others.

This unit considers how the concepts and practices of Sustainable Resource Development are being used to address some of the most pressing national, international and local issues. The unit will help learners to develop a critical appreciation of the key concepts involved, and to learn why environmental protection is important and how organisations, individuals, professionals, interest groups and communities see, react to and influence this issue. The economic significance of environmental protection for the enterprises and organisations working in the Environmental and Land-based industries will be explored.

Learners will apply their skills to a sustainability issue. While the nature and scale of the issue may well be local, the approaches will require learners to link effectively with organisations and individuals with interests in it. They will undertake thorough analyses and assessment to develop and to defend fit-for-purpose plans that are relevant to today's high profile environmental agenda.

This unit has particular emphasis for the following Personal, Learning and Thinking Skills (PLTS):

- independent enquirers
- creative thinkers
- effective participators.

## Guided learning hours

This unit has 60 GLH assigned to it, of which 3 hours will be spent on the external assessment which will be taken under examination conditions.

## Content details

<b>Learning outcomes</b> The learner will:	<b>Assessment criteria</b> The learner can:	<b>PLTS</b>
1 Know the principles of Sustainable Resource Development	a explain the ethical, economic and environmental arguments of sustainability b outline the scientific principles of Sustainable Resource Development	
2 Understand why Sustainable Resource Development matters to society	a evaluate the role of habitats at global, national and local levels b assess the value to society of Sustainable Resource Development	
3 Understand the different influences in Sustainable Resource Development	a evaluate the role of governments, organisations and agencies in Sustainable Resource Development b assess the influence of media and pressure groups on sustainability	
4 Understand how the framework supporting Sustainable Resource Development operates	a summarise the principles and practices of environmental policy, planning and decision making b assess how the protection of endangered animals, plants and habitats are managed c evaluate the purpose of biodiversity conservation d assess the industrial infrastructure required to secure good quality supplies of water, power and waste removal	
5 Be able to investigate the suitability of a Sustainable Development plan	a evaluate the effectiveness of a Sustainable Resource Development plan b justify improvements to a Sustainable Resource Development plan c generate ideas to engage communities or individuals	IE4 EP4 CT1

Where the Assessment criteria show a direct link to an area of the PLTS framework, it is referenced here. Further information on PLTS is available on pages 10–12 of the specification and also within this unit in the section on Personal, Learning and Thinking Skills.

3

## Scope of content

This section gives details of the scope of content to be covered in the teaching of this unit, to ensure that all the Learning outcomes can be met. This includes examples relating to breadth and depth where applicable.

It is important that, through the Level 3 Principal Learning in Environmental and Land-based Studies, learners receive as broad an experience of the whole sector as possible. Teachers are urged to refer to, and use examples from, appropriate industries where relevant. Details of these industries may be found on page 15 of the specification.

### Learning outcome 1

Learners must be made aware of the arguments and evidence that underpin the concept of sustainability. Teachers must make sure that they develop a detailed appreciation of the economic, environmental, political and ethical dimensions of sustainability. The areas where these dimensions overlap and the nature and implications of the contrasting/complementary aspects of them must be covered.

Learners must be prepared to evaluate the strengths and weaknesses of the principles at the heart of sustainable management. They must know how these principles influence the design of effective management strategies.

The ranges of biological and physical indicators used in Sustainable Resource Development, their meaning and use, as well as the scientific methods and techniques involved must be covered.

### Learning outcome 2

Learners must understand why global, national and local habitats are important and valuable. They must be made aware of the ways in which habitats can adapt to activities within them and what happens when they are unable to cope with the results of the activity. Learners must be aware that analysis of these habitats should be detailed, wide-ranging and evidence-based. The methods used to investigate and report upon a habitat should be covered.

The importance and value of securing sustainable resources must be made clear to learners. Teachers must help them to understand how limiting resources affects society in general, through its effect on population growth, health and development, economic development, technology and industrialisation.

The impact of Sustainable Resource Development on land-based organisations must be covered. Learners must understand that Sustainable Resource Development affects different Environmental and Land-based enterprises in various ways. They must be aware of how the operational activities of Environmental and Land-based businesses – be they rural or urban, national or international, small or large, mainstream or niche – are affected by Sustainable Resource Development priorities and developments.

### Learning outcome 3

Learners must be made aware of the roles and influence of a range of important stakeholders in managing, planning, developing and funding of Sustainable Resource Developments.

The activities of the UK government in and the contribution of its political and environmental agencies to Sustainable Resource Development, as well as the roles of important national and international professional organisations and the tasks of legislative organisations in Sustainable Resource Development working must be covered. Learners must be made aware of the success of these organisations and bodies in meeting national and international standards. Targets must be included and reasons for their success or failure must be evaluated. Learners must be aware of data on efficiency and effectiveness, standards and levels of funding.

Teachers must enable learners to compare and contrast the authority and control of these organisations with the interests, activities and influence of campaigning communities and individuals, interested amateur organisations and pressure groups. The ways in which official bodies work with these interests groups to develop legal and effective Sustainable Resource Development plans must be covered.

Teachers must make sure that learners know how to analyse the ways in which the print, digital and broadcast media in the United Kingdom deal with Sustainable Resource Development issues and the effects that media coverage has had on the pace and nature of Sustainable Resource Development.

### **Learning outcome 4**

Learners must know how an effective approach to Sustainable Resource Development is designed. Learners should be taught how the legal frameworks involved in sustainability management operate. They must be able to explain how environmental policy is developed and how the different instruments (legislation, conventions and protocols) link with the policy, planning and decision-making processes required to implement and to monitor sustainable resource management.

Learners must understand the contribution of standards to good environmental strategy design. The role of best practice in influencing future developments and in raising standards should be covered.

Teaching must enable learners to understand the contribution of Sustainable Resource Development in protecting biodiversity and in conserving endangered plants and animals, both nationally and internationally. Learners should be made aware of how the approaches to resource development that are used will bring about the desired results. They must also be made aware of the importance and purposes of protection and conservation to society.

The ways in which national and international agencies and organisations carry out their protection and conservation work must be covered. Learners must understand how these agencies assess problems, decide on an approach, report on successes or failures and develop best practice.

With some resources critical to human health and the quality of human lives, it is important that supplies are secured and predictable. Learners must know the scientific and technological principles upon which supplies of clean water, reliable power and effective waste treatments depend. Teachers must help them to understand how national infrastructures for water, waste and power have been designed and are maintained and improved.

### **Learning outcome 5**

Learners must be shown how to review a Sustainable Resource Development plan and how to offer an informed evidence-based assessment of the value and effectiveness of the plan.

Learners must be able to assess environmental evaluations and surveys critically. The objectives of the Sustainable Resource Development, implementation action plans, data requirements, monitoring procedures, results, conclusions and lessons learned must all be covered.

Learners should be enabled to make reasoned and accurate assessments of a plan's strengths and weaknesses, and to propose and justify design-based amendments or developments. They must learn how to develop and rationalise approaches to engage the services and support of interested individuals, communities and any appropriate official bodies or professional organisations.

Learners must be supported to set a plan in the context of international best practice and to assess its fit-for-purpose status.

Teachers must enable learners to use appropriate technology, such as Computer Aided Design software, to develop environmental improvement proposals for a site or habitat which meet appropriate fit-for-purpose criteria.

## Assessment

This unit is assessed externally through an examination set and marked by AQA-City & Guilds.

There will be a written examination of 3 hours, the purpose of which is to assess the learner's achievement of the Learning outcomes as indicated in the examination specification shown below.

The examination will contain case studies that reflect the Environmental and Land-based sector and ask the learner to apply knowledge and understanding gained in this unit to real sector situations.

## Examination specification

Duration: 3 hours

Assessment type: Written test

Number of marks: 90

Learning outcomes	Assessment criteria	Marks	Weighting
1 Know the principles of Sustainable Resource Development	a explain the ethical, economic and environmental arguments of sustainability	18	20%
	b outline the scientific principles of Sustainable Resource Development		
2 Understand why Sustainable Resource Development matters to society	a evaluate the role of habitats at global, national and local levels	18	20%
	b assess the value to society of Sustainable Resource Development		
3 Understand the different influences in Sustainable Resource Development	a evaluate the role of governments, organisations and agencies in Sustainable Resource Development	18	20%
	b assess the influence of media and pressure groups on sustainability		
4 Understand how the framework supporting Sustainable Resource Development operates	a summarise the principles and practices of environmental policy, planning and decision making	18	20%
	b assess how the protection of endangered animals, plants and habitats are managed		
	c evaluate the purpose of biodiversity conservation		
	d assess the industrial infrastructure required to secure good quality supplies of water, power and waste removal		
5 Be able to investigate the suitability of a Sustainable Development plan	a evaluate the effectiveness of a Sustainable Resource Development plan	18	20%
	b justify improvements to a Sustainable Resource Development plan		
	c generate ideas to engage communities or individuals		
<b>Total</b>		<b>90</b>	<b>100%</b>

## Guidance for delivery

This unit could be delivered using a range of teaching techniques. However, it is suggested that the use of case studies to illustrate particular sustainability issues and seminars/workshops in which learners can explore, discuss and suggest solutions to these issues should work well in this unit. This sort of activity should also help to develop learners' abilities to learn independently and to think critically, both of which will be valuable tools to prepare for progression to higher education.

The use of debate and role play will be of value to this topic. Learners could explore and assume the roles of the main players in current environmental issues: for example, carrying out a simulation of a planning enquiry with each learner playing a particular part.

Site visits will be useful as a means of engaging the learners with this topic so that they can appreciate the complex issues which often surround sustainability. This will be particularly valuable for Learning outcome 3, for which they should undertake some field research of a given site to enable them to assess its current status.

Although the unit is UK-based it would be helpful if learners were also to investigate issues faced and solutions developed by other countries. This experience should also provide the learner with a perspective of global sustainability.

The theme for the unit is 'developing a sustainable environment', and the need to conserve resources and to seek viable alternatives is clearly central to this theme. This unit has links with Level 3 Unit 8: Global impacts and the Environmental and Land-based sector, and Level 3 Unit 9: Research methodology, evaluation and environmental analysis. Benefits can be obtained by co-teaching this unit alongside those units so that the skills specifically developed in Level 3 Unit 9 can be used in survey activities for this unit. Similarly, an appreciation of the global impacts of Environmental and Land-based industries gained from Level 3 Unit 8 will enhance or complement the delivery of this unit.

## Opportunities for applied learning

Learners will be able to apply the skills and knowledge gained in this unit by:

- researching the current status of a given site
- planning the sustainable development of a site
- role playing different organisations and/or interest groups involved in a planning enquiry
- discussing and suggesting solutions to complex issues
- using appropriate technology and ICT to record and present data from site surveys.

## Suggested prior learning

Learners should be familiar with basic scientific concepts such as energy flow, nutrient and water cycles from previous work in science. Learners would benefit from having studied the following units from the Level 2 Principal Learning in Environmental and Land-based Studies:

- Level 2 Unit 6: The importance of a sustainable environment to society
- Level 2 Unit 7: Monitoring the environment
- Level 2 Unit 8: Sources and uses of energy.

## Personal, Learning and Thinking Skills

The list below is indicative of the way this unit supports the development of PLTS, as opposed to the achievement of PLTS that are possible through the assessment. The unit supports the development of more PLTS than are covered through the Assessment criteria alone.

Alternative approaches could be selected.

The learner could develop PLTS by:

### Independent enquirers

- considering the influence of circumstances, beliefs and feelings on decisions when evaluating the ethical implications of sustainable use of resources
- planning and carrying out research and appreciating the consequence of decisions when assessing the current status of a site

### Creative thinkers

- generating ideas and exploring possibilities when developing a management plan
- suggesting alternative solutions to complex environmental issues

### Reflective learners

- inviting feedback and dealing positively when consulting with stakeholders
- setting goals with success criteria when developing a management plan

### Team workers

- co-operating and working with others to undertake a site survey
- reaching agreements when consulting with individuals and communities

### Self-managers

- organising their own time and resources when undertaking self-directed study of or research into a given issue
- working towards goals when preparing a management plan

### Effective participators

- presenting a persuasive case for action when developing a management plan
- influencing others when consulting with individuals and communities.

## Opportunities for Functional Skills development

This unit and its associated learning activities will provide the learner with opportunities to develop and use English, mathematics and ICT in a number of ways.

This unit is similar to several others because it can include significant independent research and analysis which will afford reading skills development. In addition, some of the topics (involving, for example, ethical and political implications) provoke a variety of opinions amongst stakeholders, and learners will need to be able to detect bias and implicit meaning in texts when evaluating information and formulating a sustainability plan for a site.

## Suggested learning resources

### Books

Barrow, C. J. (2006). *Environmental Management for Sustainable Development*. Published: Routledge. ISBN: 978-0415365352.

Elliott, J. A. (1999). *An Introduction to Sustainable Development*. Published: Routledge. ISBN: 978-0415191517.

Marten, G. G. (2001). *Human Ecology: Basic Concepts for Sustainable Development*. Published: Earthscan Ltd. ISBN: 978-1853837142.

Rogers, P. P.; Jalal, K. F.; Boyd, J. A. (2007). *An Introduction to Sustainable Development*. Published: Earthscan Ltd. ISBN: 978-1844075201.

Scott, W.; Gough, S. (2003). *Key Issues in Sustainable Development and Learning: A Critical Review*. Published: Routledge Falmer. ISBN: 978-0415276504.

### Websites

- The Wildlife Trusts [www.wildlifetrusts.org](http://www.wildlifetrusts.org)
- Environmental Agency [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)
- FSC (Field Studies Council) [www.field-studies-council.org](http://www.field-studies-council.org)
- Forestry Commission GB [www.forestry.gov.uk](http://www.forestry.gov.uk)
- BTCV [www2.btcv.org.uk](http://www2.btcv.org.uk)
- Soil Association [www.soilassociation.org](http://www.soilassociation.org)
- Natural England [www.naturalengland.org.uk](http://www.naturalengland.org.uk)
- Natural Environment Research Council [www.nerc.ac.uk](http://www.nerc.ac.uk)
- Sustainable Development Research Network [www.sd-research.org.uk](http://www.sd-research.org.uk)
- Environment UK [www.britishcouncil.org/environmentuk](http://www.britishcouncil.org/environmentuk)
- The Royal Society <http://royalsociety.org>

# Level 3 Unit 8: Global impacts and the Environmental and Land-based sector

## What is this unit about?

Our world is becoming increasingly interconnected; the UK is part of a global system in which environmental changes elsewhere in the world can significantly affect us. For many people around the world the most pressing environmental issues include changes to the world's weather, climate and oceans. Understanding the nature, causes and scale of these problems, and developing ways of addressing them, is a priority for many nations.

Many Environmental and Land-based organisations in the UK are directly affected by the changing climate and weather, as they work with the land, water, plants and animals in our natural environment. In an attempt to limit the worst impacts of these developments, some societies are looking closely at how their activities affect other communities around the world. Many are seeking to improve their technologies and business practices in a carbon-constrained economy and to encourage their citizens to use resources in a more future-friendly way.

For some plants and animals the current environmental changes may dictate whether they adapt and survive or die, while for the sector's enterprises, these environmental changes could mean the difference between business success and failure. Businesses have to recognise, evaluate and adapt to these changes to ensure that they will survive and thrive. How they do it, the timescale over which they do it, and their success in doing it will be critical. New skills will be required to support these new businesses, as what they do, and how they do it, changes.

This unit is concerned with examining these issues. It will look at how some of the major environmental issues affect us and the ways in which we as a society are responding to the challenges they pose.

The unit has particular emphasis for the following Personal, Learning and Thinking Skills (PLTS):

- creative thinkers
- effective participators.

## Guided learning hours

This unit has 60 GLH assigned to it, of which approximately 6 hours will be needed for the assessment. Details of specific controls needed in relation to the internal assessment are shown in the Assessment section of this unit. Overall information on controls is on pages 114–118 of this specification.

## Content details

<b>Learning outcomes</b> The learner will:	<b>Assessment criteria</b> The learner can:	<b>PLTS</b>
1 Understand the causes of climate change	a evaluate the impact of Environmental and Land-based practices on climate change b evaluate natural factors that affect climate change	
2 Understand the impact of climate change on commercial systems in the Environmental and Land-based sector	a evaluate the impact of ecological practices on commercial systems b evaluate the response of global businesses and enterprises	
3 Know the current issues in the management of sustainable resources	a explain the concept of carbon management b describe the implications of poor management of finite resources c define the drivers in environmental management on local, national and global scales d describe how human pressures are managed	
4 Know how the impacts of climate change can be minimised	a describe the use of renewable resources for producing energy b identify innovations that can be applied to pollution, waste management and recycling	
5 Be able to develop a plan for a carbon neutral future	a generate ideas for a business or individual to become carbon neutral b evaluate business reliance on non-renewable resources c identify how renewable resources could be used to provide sustainable energy d review plan, identifying issues of concern for achieving carbon neutrality, and seek resolutions for future progress	CT1   EP1

3

Where the Assessment criteria show a direct link to an area of the PLTS framework, it is referenced here. Further information on PLTS is available on pages 10–12 of the specification and also within this unit in the section on Personal, Learning and Thinking Skills.

## Scope of content

This section gives details of the scope of content to be covered in the teaching of this unit, to ensure that all the Learning outcomes can be met. This includes examples relating to breadth and depth where applicable.

It is important that, through the Level 3 Principal Learning in Environmental and Land-based Studies, learners receive as broad an experience of the whole sector as possible. Teachers are urged to refer to, and use examples from, appropriate industries where relevant. Details of these industries may be found on page 15 of the specification.

### Learning outcome 1

Learners must be made aware of the research, and its interpretation, that suggest that climate change is happening. This should include a full evidence-based consideration of the nature and significance of the natural factors believed to be contributing to climate change, as well as the scale and nature of climate change which is believed to come from human activities through its industries, businesses and living styles, which must include food production, energy needs, recreational use of habitats and tourism.

Teachers must give learners the opportunity to consider how the activities of the Environmental and Land-based sector's enterprises are believed to be contributing to climate change. The businesses considered must be drawn from across the sector and include examples of the different ways that they are believed to affect climate change. Evaluations must require learners to consider details of the business strategies and operational practices of Environmental and Land-based enterprises and to be able to propose and justify the nature and gravity of any climate impacts that arise. The way in which some impacts are localised, whereas others have regional, national and global dimensions to their impact, must also be covered.

### Learning outcome 2

Learners must consider how global weather and climate changes are affecting the UK and its different regions and habitats.

Teachers must give learners an understanding of how commercial enterprises and businesses are affected by moves to address climate change. Learners must consider how changes to legislation and environmental standards made to moderate climate change are altering the ways in which Environmental and Land-based businesses are operating and developing in the UK and around the world.

Teachers must make sure that learners are able to analyse these operational changes in terms of the advantages accruing to the climate, and also to evaluate how these new practices might bring advantages to businesses offering services and goods to an increasingly environmentally literate society.

Learners must also consider how international co-operation as well as competition between enterprises around the world are leading to new technologies, business practices and markets for the UK's innovative Environmental and Land-based enterprises.

### Learning outcome 3

This outcome is concerned with introducing learners to resource management as it affects the environment. It covers the management of carbon, a key contributor to climate change, and also looks at the wider issues surrounding the climate implications of the extravagant use of resources in general.

Learners must be taught why carbon, a carbon-constrained economy, carbon off-setting and carbon management are crucial elements in the climate change agenda. The ways in which carbon contributes to climate change must be addressed. The national strategies being used to manage carbon and the ways in which Environmental and Land-based enterprises are playing their part in reducing carbon emissions must be covered. The science behind carbon management technology and its implications for Environmental and Land-based enterprises must be evaluated. The global dimension to carbon management must be evaluated and the ways in which it is being coordinated must be clear.

Teachers must show learners the different ways in which carbon reduction has affected operational activities in Environmental and Land-based enterprises here and abroad. Data on targets and impact assessments of carbon management strategies must be analysed.

Learners must be taught the implications of poor resource management for the climate, in terms of the economic and environmental implications arising from current resource management practices and as resources become scarce or difficult to manage. The economic, cultural and political aspects of poor resource management must also be considered.

Learners must be taught how these human pressures are managed. They should be aware of some of the threats to the environment of some of the more major demands associated with food, waste, power and water, and learn how these demands are being met by enterprises. Learners must consider the different ways in which society can reduce human resource demands.

Teachers must provide learners with knowledge of the development and impact of drivers affecting local, national and global environmental strategies.

### **Learning outcome 4**

Course programmes must cover the environmental implications of current energy production mechanisms and why moves to renewable sources are required. An awareness of the science behind renewable production is required, as well as some of the major technological challenges that have been overcome and those which still exist. Learners must be able to assess the efficiency, application and contribution of renewable energy sources to the UK's energy needs.

Learners must be taught why pollution management and waste management matter to society and to the environment. The management strategies for both pollution management and waste should be understood as well as the science behind each of them. Learners should understand the scale and nature of the problems and be able to explain how innovative ways of managing pollution and waste are contributing to the strategies, including changes to community behaviours and new technologies.

### **Learning outcome 5**

This outcome requires learners to apply their understanding to an Environmental and Land-based context. Learners need to know how to carry out a business audit, evaluate data on business performance, assess operational activities and measure business dependency on non-renewable resources.

Learners must be able to evaluate an organisation's capacity to remove, alter or develop alternative approaches to increase its use of renewable resources, and the business implications of doing so. They must be able to bring these issues together in a coherent and effective business plan.

Teachers need to provide learners with a range of contentious issues to identify in the plan, and advise learners on ways in which appropriate resolutions could be secured.

In order to produce a plan, learners need to be made aware that the following contents are expected:

- definitions, explanations, and descriptions of global impacts
- consequences of not reducing these impacts globally
- current issues relating to the business
- analysis of the current environmental impact of the business
- consequences for the business of not reducing these impacts
- possible means of reducing these impacts
- costs and benefits associated with these measures.

## Assessment

This unit is assessed through a centre set and marked assignment. Internal assessments are subject to moderation by AQA-City & Guilds.

Learners are required to carry out a holistic investigation of the global implications of climate change and resource exploitation, and then to generate solutions for a local Environmental and Land-based business that will reduce or improve the business's overall environmental impact.

### Task setting

Internal assessments must aim to be holistic in nature and encourage learners to produce evidence to cover the Assessment criteria.

The assignment set must cover the tasks as set out in the table below.

Task	Form(s) of evidence	LO mapping
Investigation of the sector and business	The following must be provided: <ul style="list-style-type: none"><li>report of business in its global context</li></ul>	LO1, 2, 3
Development of a business strategy and action plan	The following must be provided: <ul style="list-style-type: none"><li>presentation of strategy and action plan for a carbon neutral future for the business</li></ul>	LO4 and 5

### Duration

The assessment is not time constrained. The following is a guide to appropriate times for the assessment activities:

Research plan – 1 hour

Practical research – 3 hours

Preparation and presentation of report – 2 hours.

### Sector relevant purpose

The assessment activity will place local business in the context of global issues and produce realistic solutions that could be utilised by the business.

### Demand

Each learner may choose a business with which they are familiar, and which is within the Environmental and Land-based sector, as the context for the assignment.

The report may be in any format that will allow complete presentation of the content required (eg PowerPoint, written report, oral report) and will be aimed at the management of the business.

### Task taking

Details of controls that should be applied during the taking of the assessment tasks are set out on pages 114–116 of the specification.

## Weighting of Learning outcomes

Learning outcomes	Marks	Weighting
1 Understand the causes of climate change	18	20%
2 Understand the impact of climate change on commercial systems in the Environmental and Land-based sector	18	20%
3 Know the current issues in the management of sustainable resources	12	13.3%
4 Know how the impacts of climate change can be minimised	12	13.3%
5 Be able to develop a plan for a carbon neutral future	30	33.3%
<b>Total</b>	<b>90</b>	<b>100%</b>

## Assessment grid

Please note that the descriptions in this marking grid relate to the top of each band. Further guidance on using marking grids is available in the Assessment section of this specification.

Learning outcomes	Band 1	Band 2	Band 3
	The learner has:		
	0 to 6 marks	7 to 12 marks	13 to 18 marks
1 Understand the causes of climate change	Briefly evaluated the impact of a limited range of aspects of Environmental and Land-based practices to climate change.  Briefly evaluated the impact of natural factors on climate change.	Evaluated the impact of Environmental and Land-based practices on climate change.  Evaluated the impact of natural factors on climate change.	Evaluated a range of impacts of Environmental and Land-based practices on climate change.  Evaluated in detail the impact of natural factors on climate change.
	0 to 6 marks	7 to 12 marks	13 to 18 marks
2 Understand the impact of climate change on commercial systems in the Environmental and Land-based sector	Briefly evaluated the impact of climate change on commercial systems in the Environmental and Land-based sector.  Briefly evaluated the response of a business to a global issue.	Evaluated in detail the impact of climate change on commercial systems in the Environmental and Land-based sector.  Evaluated in detail the response of a business to a global issue.	Comprehensively evaluated the impact of climate change on commercial systems in the Environmental and Land-based sector.  Comprehensively evaluated the response of a business to a global issue.
	0 to 4 marks	5 to 8 marks	9 to 12 marks
3 Know the current issues in the management of sustainable resources	Briefly explained the concept of carbon management.  Described some implications of poor management of a limited range of finite resources.  Briefly defined the drivers in environmental management on local, national and global scales.  Briefly described how issues arising from human pressures on the environment are managed.	Explained in detail the concept of carbon management.  Described short- or long-term implications of poor management of a range finite resources.  Defined in detail the drivers in environmental management on local, national and global scales.  Described in detail how issues arising from human pressures on the environment are managed.	Comprehensively explained the concept of carbon management.  Described short- and long-term implications of specific aspects of poor management of a range of finite resources.  Comprehensively defined the drivers in environmental management on local, national and global scales.  Comprehensively described how issues arising from human pressures on the environment are managed.

## Assessment grid (continued)

Learning outcomes	Band 1	Band 2	Band 3
	The learner has:		
	0 to 4 marks	5 to 8 marks	9 to 12 marks
4 Know how the impacts of climate change can be minimised	<p>Briefly described how the use of renewable resources can produce energy in the future.</p> <p>Identified some innovations that can be applied to pollution, waste management and recycling.</p>	<p>Described in detail how the use of renewable resources can produce energy in the future.</p> <p>Identified a good range of innovations that can be applied to pollution, waste management and recycling.</p>	<p>Comprehensively described how the use of renewable resources can produce energy in the future.</p> <p>Identified most innovations that can be applied to pollution, waste management and recycling.</p>
	0 to 10 marks	11 to 20 marks	21 to 30 marks
5 Be able to develop a plan for a carbon neutral future	<p>Generated some basic ideas for a carbon neutral future for a business.</p> <p>Evaluated aspects of business reliance on some non-renewable resources.</p> <p>Identified how a renewable resource could be used to provide sustainable energy.</p> <p>Reviewed plan and identified an issue of concern for achieving carbon neutrality, and attempted to seek resolutions for future progress.</p>	<p>Generated ideas for a carbon neutral future targeted at specific aspects of the business.</p> <p>Evaluated business reliance on a non-renewable resource.</p> <p>Identified how renewable resources could be used to provide sustainable energy.</p> <p>Reviewed plan and identified some significant issues of concern for achieving carbon neutrality, and sought some resolutions for future progress.</p>	<p>Generated viable ideas for a carbon neutral future that are comprehensively related to aspects of the business.</p> <p>Evaluated business reliance on most non-renewable resources being used.</p> <p>Identified how a choice of renewable resources could be used to provide sustainable energy to meet most requirements.</p> <p>Reviewed plan and identified most significant issues of concern for achieving carbon neutrality, and identified viable resolutions for future progress.</p>

## Guidance for delivery

This unit invites the use of a range of teaching techniques. Case studies to illustrate particular environmental issues and seminars/workshops will enable learners to explore, discuss and suggest solutions. This approach will develop independent and critical thinking which will be valuable for progression to higher education.

A major emphasis of this unit should be the critical evaluation of information sources such that the learners review the range of evidence for global climate change and the predictive models used to develop global warming scenarios.

Site visits will be a useful means of engaging the learners with this topic and helping them to appreciate the complex issues which often surround alternative energy sources.

Learners should appreciate the global scale of environmental issues and it will be helpful for them to investigate issues and solutions that other countries have developed. They should then be in a better position to offer local solutions to some of these issues.

One of the messages from the environmental movement is ‘think globally, act locally’ – the aim of this unit is to enable learners to understand and do exactly that. They should be encouraged to investigate the global implications of climate change and resource exploitation and to generate solutions for local Environmental and Land-based businesses that will reduce impacts on the environment.

When considering the impact of natural and human-induced climate change on commercial systems in the Environmental and Land-based sector, learners may use examples from their local area: for example, a forester may not be able to plant certain tree species if there are excessive levels of rainfall and flooding.

For the learner to investigate a business, and their own situation, in terms of carbon consumption, they need to identify how carbon is managed and to develop a strategy and action plan for a carbon neutral future.

A business within the local area must be investigated to evaluate its response to a major global issue. This will involve investigating how the chosen business reacts by changing its activities in relation to the global issue eg reducing waste, reducing energy consumption to reduce carbon, using carbon offsetting, carbon exchange, planting a large area with trees etc. This can be delivered and assessed in conjunction with the development of a strategy and action plan for a neutral future of a business.

Key speakers, such as local countryside rangers, farmers, weather forecasters, environmental scientists, foresters, gamekeepers, horticulturists, pedologists, leisure facility managers, tourist information officers, researchers etc may be invited to assist in the delivery of this unit.

The theme for the unit is ‘developing the sustainable environment’ and the unit links very closely with Level 3 Unit 7: Sustainable management and development of resources, and Level 3 Unit 9: Research methodology, evaluation and environmental analysis. This unit contributes to this theme by exploring current issues in the management of environmental resources for a sustainable future and the impact of changing natural processes on commercial systems in the Environmental and Land-based sector.

Benefits can be obtained by co-teaching this unit alongside Level 3 Unit 7 and Level 3 Unit 9, as many of the principles covered in this unit will be equally applicable to those units.

## Opportunities for applied learning

Learners will be able to apply the skills and knowledge gained in this unit by:

- researching the current environmental impact of a business
- developing plans to reduce the environmental footprint of a business
- discussing and suggesting solutions to complex issues.

## Suggested prior learning

Learners should be familiar with basic scientific concepts such as energy flow, nutrient and water cycles.

## Personal, Learning and Thinking Skills

The list below is indicative of the way this unit supports the development of PLTS, as opposed to the achievement of PLTS that are possible through the assessment. The unit supports the development of more PLTS than are covered through the Assessment criteria alone.

Alternative approaches could be selected.

The learner could develop PLTS by:

### Independent enquirers

- planning and carrying out research, appreciating consequences of decisions when producing a strategy to reduce the environmental impact of a local business
- supporting conclusions, using reasoned arguments and evidence when recommending an alternative energy source for a local business

### Creative thinkers

- generating ideas and exploring possibilities when planning for the sustainable use of resources for a business
- connecting own and others' ideas and experiences in inventive ways when suggesting solutions to complex environmental issues

### Reflective learners

- setting goals with success criteria when developing an environmental strategy for a business
- evaluating experiences of alternative energy systems to inform future decisions

### Team workers

- co-operating with others to undertake an analysis of alternative energy solutions
- providing constructive support and feedback when discussing ideas

### Self-managers

- working towards goals and showing initiative when undertaking self-directed study of or research into a given issue
- organising own time and resources when undertaking self-directed study of or research into a given issue

### Effective participators

- presenting a persuasive case for action when finalising an environmental plan for a business
- trying to influence others to reach a workable solution for an environmental issue.

## Opportunities for Functional Skills development

This unit and its associated learning activities will provide the learner with opportunities to develop and use English, mathematics and ICT in a number of ways.

Much of this unit requires research into the management of environmental resources. This will involve exposure to a range of information in different formats and will also include some numerical information requiring analysis and evaluation. This work will offer opportunities for English skills development and, more significantly, mathematical work such as using equations to, for example, calculate the efficiency of certain renewable energy supplies.

## Suggested learning resources

### Books

Barrow, C. J. (2006). *Environmental Management for Sustainable Development*. Published: Routledge. ISBN: 978-0415365352.

Dessler, A. E.; Parson, E. A. (2006). *The Science and Politics of Global Climate Change: A Guide to the Debate*. Published: Cambridge University Press. ISBN-10: 978-0521539418.

Elliot, D. (2003). *A Solar World: Climate Change and the Green Energy Revolution: Schumacher Briefing No. 10*. Published: Green Books. ISBN: 978-1903998311.

Glasson, J.; Therivel, R.; Chadwick, A. (2005). *Introduction to Environmental Impact Assessment (Natural & Built Environment)*. Published: Taylor & Francis Ltd. ISBN: 978-0415338370.

Claussen, E.; Hoffman, A. J. (2007). *Carbon Strategies: How Leading Companies Are Reducing Their Climate Change Footprint*. Published: University of Michigan Press. ISBN: 978-0472032655.

Meyer, A. (2000). *Contraction and Convergence: The Global Solution to Climate Change*. Published: Green Books. ISBN: 978-1870098946.

Rogers, P. P.; Jalal, K. F.; Boyd, J. A. (2007). *An Introduction to Sustainable Development*. Published: Earthscan Ltd. ISBN: 978-1844075201.

Lomborg, B. (2001). *The Skeptical Environmentalist: Measuring the real state of the world*. Published: Cambridge University Press. ISBN: 978-0521010689.

Girling, R. (2005). *Rubbish! (Dirt on our hands and crisis ahead)*. Published: Eden Project Books. ISBN: 978-1903919446.

Morgan, S. (2005). *Waste, Recycling and Reuse (Sustainable Futures)*. Published: Evans Brothers Ltd. ISBN: 978-0237527709.

MacDonald, F. (2007). *Waste and Recycling (British Issues)*. Published: Franklin Watts. ISBN: 978-0749676025.

Merrington, G; Winder Nfa, Dr L. ; Parkinson, R.; Redman, M; Winder, L. (2002). *Agricultural Pollution: Problems and Practical Solutions (Environmental Science & Engineering)*. Published: Taylor & Francis. ISBN: 978-0419213901.

Hill, M. K. (2004). *Understanding Environmental Pollution: A Primer*. Published: Cambridge University Press. ISBN: 978-0521527262.

### Websites

- Department for Environment, Food & Rural Affairs [www.defra.gov.uk](http://www.defra.gov.uk)
- UK Dept for Business, Enterprise & Regulatory Reform [www.berr.gov.uk](http://www.berr.gov.uk)
- Lantra [www.lantra.co.uk](http://www.lantra.co.uk)
- The Wildlife Trusts [www.wildlifetrusts.org](http://www.wildlifetrusts.org)
- Environmental Agency [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)
- FSC (Field Studies Council) [www.field-studies-council.org](http://www.field-studies-council.org)
- Forestry Commission GB [www.forestry.gov.uk](http://www.forestry.gov.uk)
- BTCV [www2.btcv.org.uk](http://www2.btcv.org.uk)
- Soil Association [www.soilassociation.org](http://www.soilassociation.org)
- UNESCO [www.unesco.org](http://www.unesco.org)
- British Ecological Society [www.britishecologicalsociety.org](http://www.britishecologicalsociety.org)
- Royal Society <http://royalsociety.org>
- Environment UK [www.britishcouncil.org/environmentuk](http://www.britishcouncil.org/environmentuk)
- The Environmental Association for Universities and Colleges [www.eauc.org.uk](http://www.eauc.org.uk)
- Natural Environment Research Council [www.nerc.ac.uk](http://www.nerc.ac.uk)

# Level 3 Unit 9: Research methodology, evaluation and environmental analysis

## What is this unit about?

Environmental and Land-based businesses work with the natural world, which is governed by universal laws and processes. While these businesses may seek to influence natural environments to ensure ecological or business objectives, they cannot do so predictably without understanding how these environments work and where their efforts to influence them will have most effect. Understanding these laws and processes enables us to manage our environment and habitats effectively.

We build our understanding by measuring what is happening and attempting to explain it. We look for mechanisms that might be responsible for what we observe and then develop and test models to explain what we have measured. To do this, our scientific understanding has to be comprehensive and accurate.

This unit covers the techniques used by ecological scientists to study environments. It looks at how and why these studies are important, and how they are planned, resourced and carried out. It also looks at the data that studies of this type create, the reliability and errors of this data, and how deductions are made from it.

This unit has particular emphasis for the following Personal, Learning and Thinking Skills (PLTS):

- independent enquirers
- team workers
- self-managers.

## Guided learning hours

This unit has 60 GLH assigned to it, of which 6 hours will be needed for the assessment. Details of specific controls needed in relation to the internal assessment are shown in the Assessment section of this unit. Overall information on controls is on pages 114–118 of this specification.

## Content details

Learning outcomes The learner will:	Assessment criteria The learner can:	PLTS
1 Understand the value of environmental evaluation	a explain the purposes, importance and consequences of carrying out environmental evaluation of habitats	
	b determine the location of suitable areas of a habitat for surveying and analysis for a given purpose	
	c evaluate the importance of a sound evidence base to environmental evaluation	
2 Understand the use and execution of environmental impact assessments	a explain the purpose of carrying out scientific techniques for environmental assessments	
	b interpret both the primary and secondary data to provide realistic conclusions	
	c explain how recommendations are reached from an Environmental Impact Assessment	
	d evaluate the use of economic and social tools to support the objectives of an Environmental Impact Assessment	
3 Be able to use scientific techniques and resources to undertake valid research	a justify the choice of scientific techniques used to carry out environmental assessments	
	b evaluate risks and ways to minimise risks to both the researcher and the habitat	SM4
	c collate, with colleagues, data gained from primary research appropriately	TW1
	d analyse the results of primary and secondary research, eliminating bias, to provide conclusions for environmental evaluation	IE4
	e apply decision-making techniques to produce valid conclusions and proposals	

Where the Assessment criteria show a direct link to an area of the PLTS framework, it is referenced here. Further information on PLTS is available on pages 10–12 of the specification and also within this unit in the section on Personal, Learning and Thinking Skills.

## Scope of content

This section gives details of the scope of content to be covered in the teaching of this unit, to ensure that all the Learning outcomes can be met. This includes examples relating to breadth and depth where applicable.

It is important that, through the Level 3 Principal Learning in Environmental and Land-based Studies, learners receive as broad an experience of the whole sector as possible. Teachers are urged to refer to, and use examples from, appropriate industries where relevant. Details of these industries may be found on page 15 of the specification.

### Learning outcome 1

This outcome is concerned with developing learners' appreciation of how environmental evaluations are designed and how the quality of the data they create is critical to understanding what is going on.

Teachers must provide learners with an understanding of the limitations of what environmental evaluations can do. Learners must know how choices about the methods of evaluation are matched with the information that is required, and understand the implications and consequences for the environment of evaluations that interfere with or disturb it.

Learners must be taught how suitable locations for investigation are determined and how this links with the evaluation's objectives, methods and techniques. They are expected to understand why research has to be realistic, affordable, targeted and pragmatic and to look at ways in which these factors are achieved.

Learners must be given an understanding of the significance of sound, accurate and reproducible results and the dangers of planning actions on weak or inaccurate data. The link between data and deductions must be explored.

The nature and significance of research error must be evaluated and include a consideration of the impact of researchers' prejudices on aspects of the work. The ways in which researchers minimise these and other errors in their work and the work of others must be clear. The role of peer review must be covered.

### Learning outcome 2

Teachers must provide learners with an understanding of how Environmental Impact Assessment (EIAs) a combination of scientific techniques to achieve their aims. They must have a sound understanding of some of the common techniques used in EIAs, to include the purpose of each technique, how it delivers the outcome required, its strengths and weaknesses and the types of data it generates. Learners must be given an understanding of how the techniques are prepared, how they are used on site and how each technique contributes to the EIA overall aims.

Learners must know how the universally significant scientific method is applied to EIAs. Learners should know how investigation design and implementation, its results and conclusions influence levels of confidence in the assessment and affect experimental error.

Learners must recognise the significance of good quality research evidence and its implications for deductions, conclusions and follow-up actions based on it. The different ways in which common types of evaluation data are recorded and displayed must be covered. Learners must be able to collect, collate and interpret qualitative and quantitative data generated by some of the common techniques, and must be shown how to judge and critically appraise the validity and reliability of data.

The capacity to work with data from a variety of complementary and contrasting techniques is expected. Teachers must guide learners to develop the ability to manipulate and interpret and evaluate statistical data and draw appropriate conclusions from conflicting and contrasting evidence. The tools used in statistical analysis of results should be comprehensive and must provide learners with an informed appreciation of probability and its role in scientific research. The contribution of formal decision-making techniques to the scientific methods must be made clear.

Learners must understand how some techniques require significant amounts of resources, and how the cost and availability of these resources are part of the evaluation's planning process.

The link between research results and the recommendations for follow-up action must be clear. The ways in which levels of confidence and experimental error in the results influence recommendations for follow-up action must be covered.

Learners must also be taught how some post-evaluation recommendations secure their impact through social and economic tools and learners must be able to determine their effectiveness and suitability.

### **Learning outcome 3**

This outcome requires learners to undertake a research investigation. Learners must take the process through from inception to completion. They must plan an investigation, identify the resources required, select the techniques to be used, carry out the investigation and, working with colleagues, record, collect and collate the data appropriately. They must evaluate the results, reducing errors and bias to a minimum, and develop and justify evidence-backed recommendations for the future management of the environment that they have investigated.

Teachers must ensure that learners work to professional standards when in the field, undertake a rigorous and statistically valid analysis of the results that they generate, and produce a robust and demonstrable set of recommendations. Learners must reflect on the processes that they used and the quality of the outcomes that they generated, and be able to conclude with a convincing lessons-learned analysis.

## Assessment

This unit is assessed through a centre set and marked assignment. Internal assessments are subject to moderation by AQA-City & Guilds.

This assignment has a holistic approach and encompasses all of the Learning outcomes in the assessment. It involves both practical and desk-based activities and allows the learner to work collectively with others in a team.

Environmental analysis needs to take place before changes to or development of a habitat, or monitoring when pollution etc. This is where environmental practitioners are required to apply a range of scientific techniques to assess the habitat. The results of the scientific techniques together with data that may have already been produced (secondary data eg species lists, soil maps) are then interpreted and analysed using a variety of statistical and specialist computer packages to provide conclusions. These conclusions enable the practitioner to evaluate the habitat in terms of its importance and value for nature conservation. Recommendations can then be made as to whether the land-use change etc should proceed. The assessment has been designed to enable the learners to demonstrate the research and technical skills that they have developed by carrying out such an environmental analysis on an actual habitat in their locality.

### Task setting

Internal assessments must aim to be holistic in nature and encourage learners to produce evidence to cover the Assessment criteria.

The assignment set must cover the tasks as set out in the table below.

Task	Form(s) of evidence	LO mapping
Scientifically based research and production of a formal report based upon a single habitat	The following must be provided: <ul style="list-style-type: none"> <li>• a map of the habitat with key</li> <li>• a risk assessment</li> <li>• details of scientific techniques</li> <li>• primary results</li> <li>• secondary results</li> <li>• analysis of results</li> <li>• formal report including</li> <li>• conclusions and recommendations</li> </ul>	LO1, 2, 3

### Duration

The assessment is not time constrained. The following is a guide to appropriate times for the assessment activities:

Research plan – 1 hour

Practical research – 3 hours

Preparation and presentation of report – 2 hours.

### Sector relevant purpose

The assessment activity will focus on the learner's ability to plan a practical scientific investigation and to carry out analysis to produce a formal report on a sector-based topic or issue. This will provide a basis of knowledge for decision-making in the Environmental and Land-based sector.

## Demand

Teachers should guide learners to carry out sufficient tests of physical features, man-made features and vegetation to ensure that the main components of the area are recognised.

Periodic observations should be collected over a month and supplemented by anecdotal information for the remainder of the year.

Report and presentation may be in any format (eg PowerPoint, written report, oral report) aimed at the owner of the environment.

## Task taking

Details of controls that should be applied during the taking of the assessment tasks are set out on pages 114–116 of the specification.

## Weighting of Learning outcomes

Learning outcomes	Marks	Weighting
1 Understand the value of environmental evaluation	18	20%
2 Understand the use and execution of environmental impact assessments	45	50%
3 Be able to use scientific techniques and resources to undertake valid research	27	30%
<b>Total</b>	<b>90</b>	<b>100%</b>

## Assessment grid

Please note that the descriptions in this marking grid relate to the top of each band. Further guidance on using marking grids is available in the Assessment section of this specification.

Learning outcomes	Band 1	Band 2	Band 3
	The learner has:		
	0 to 6 marks	7 to 12 marks	13 to 18 marks
1 Understand the value of environmental evaluation	<p>Briefly explained the purpose, importance and consequences of carrying out environmental evaluation of the habitat.</p> <p>Determined the location of some of the areas for surveying and analysis.</p> <p>Briefly evaluated the importance of a sound evidence base to environmental evaluation.</p>	<p>Clearly explained the purpose, importance and consequences of carrying out environmental evaluation of the habitat.</p> <p>Determined the location of the main areas for surveying and analysis.</p> <p>Evaluated in some detail the importance of a sound evidence base to environmental evaluation.</p>	<p>Thoroughly explained the purpose, importance and consequences of carrying out environmental evaluation of the habitat.</p> <p>Determined the location of all of the areas for surveying and analysis.</p> <p>Comprehensively evaluated the importance of a sound evidence base to environmental evaluation.</p>
	0 to 15 marks	16 to 30 marks	31 to 45 marks
2 Understand the use and execution of environmental impact assessments	<p>Briefly explained the purpose of the scientific techniques used to carry out Environmental Impact Assessments (EIAs).</p> <p>Interpreted and applied with little understanding both the primary and secondary data to provide some realistic conclusions.</p> <p>Briefly explained how recommendations are reached from an EIA</p> <p>Briefly evaluated how economic and social tools can be used to support the objectives of the EIA.</p>	<p>Explained in detail the purpose of the scientific techniques used to carry out Environmental Impact Assessments (EIAs).</p> <p>Interpreted and applied with some understanding both the primary and secondary data to provide mainly realistic conclusions.</p> <p>Clearly explained how recommendations are reached from an EIA</p> <p>Evaluated in some detail how economic and social tools can be used to support the objectives of the EIA.</p>	<p>Comprehensively explained the purpose of the scientific methods used to carry out Environmental Impact Assessments (EIAs).</p> <p>Interpreted and applied with clarity and logic both the primary and secondary data to provide realistic and most significant conclusions.</p> <p>Comprehensively explained how recommendations are reached from an EIA</p> <p>Comprehensively evaluated how economic and social tools can be used to support the objectives of the EIA.</p>

3

## Assessment grid (continued)

Learning outcomes	Band 1	Band 2	Band 3
	The learner has:		
	0 to 9 marks	10 to 18 marks	19 to 27 marks
3 Be able to use scientific techniques and resources to undertake valid research	<p>Briefly justified, the scientific techniques used to carry out environmental assessments.</p> <p>Evaluated some of the risks and ways to minimise risks to both the researcher and the habitat.</p> <p>Collated some of the data gained from primary research appropriately with limited involvement with colleagues.</p> <p>Briefly analysed, the results of primary and secondary research to provide conclusions for the environmental evaluation.</p> <p>Applied few decision-making techniques to produce limited valid conclusions and proposals.</p>	<p>Justified the scientific techniques used to carry out environmental assessments.</p> <p>Evaluated the majority of the risks and ways to minimise risks to both the researcher and the habitat.</p> <p>Collated the majority of the data gained from primary research appropriately with colleagues.</p> <p>Clearly analysed, the results of primary and secondary research to provide conclusions for the environmental evaluation.</p> <p>Applied detailed decision-making techniques to produce valid conclusions and proposals.</p>	<p>Convincingly justified, the scientific methods used to carry out environmental assessments.</p> <p>Comprehensively evaluated, the risks and ways to minimise risks to both the researcher and the habitat.</p> <p>Collated all of the data gained from primary research appropriately, working well with colleagues.</p> <p>Analysed in detail the results of primary and secondary research to provide conclusions for the environmental evaluation.</p> <p>Comprehensively applied, detailed decision-making techniques to produce highly valid conclusions and specified proposals.</p>

3

## Guidance for delivery

This unit involves active learning which allows ample opportunity for learners to become familiar with collecting and analysing primary data. It is important that the learning is directed to practical field studies of habitats within the local area.

To carry out the survey work, it is envisaged that learners will work in groups for the collection of data. However, the recording, collation and analysis of data should be carried out independently. Learners may also share secondary data, but again the recording and analysis of this data must be done independently.

The assignment and delivery of this unit should be viewed from a holistic approach and may be taught in conjunction with Level 3 Unit 1: The ecology of the natural environment and the importance of biodiversity, whereby data may be collected for both units.

In order that there is enough data to collect and analyse, a suitable habitat must be chosen from:

- woodland
- field
- moorland
- peat bog
- heathland
- river
- sea shore
- sand dune
- salt marsh
- fen.

The purpose of carrying out an environmental evaluation will be to:

- provide baseline data for biological records
- carry out scientific research
- evaluate the importance of the habitat in terms of its conservation value
- evaluate the threat from development
- evaluate the threat from change in environmental or land use (eg to a golf course)
- measure pollution (land, water and air) and waste levels (agricultural, domestic and industrial waste)
- complete an application for an Integrated Pollution Prevention and Control (IPPC) Licence
- produce Annual Environmental Reports (AER).

Teacher supervision is essential during the field survey, to ensure adherence to correct health and safety procedures and the appropriate use of equipment for data collection.

The features that should be included on maps of habitats are:

- physical features eg ponds, watercourses, rock outcrops, hills, slopes
- man-made features eg fences, roads, tracks, buildings
- vegetation eg woods, wetland, grassland, scrub, moorland.

Teachers must make learners aware of the range of scientific techniques that are appropriate for the chosen habitat and deliver this part of the syllabus before field visits take place.

The types of secondary data that may be used could be species lists, soil types and pH, water quality analysis, air quality analysis etc and may be of the following formats:

- maps
- national and local records of species
- management plans
- aerial photographs
- historical records and archives
- sites and monuments records.

To assist with the report writing skills required within this unit, local country park, nature reserve, or farm management plans could be used in conjunction with discussions with the staff of these facilities. In addition, talks from industry may be applicable and available, for example from the construction, energy, manufacturing and pharmaceutical industries. These may acquire land for development and require an Environmental Impact Assessment, need to carry out an Environmental Audit, complete an application for an Integrated Pollution Prevention and Control (IPPC) Licence or produce Annual Environmental Reports (AER). The dual usage of habitats for conservation and leisure recreation must be considered, and suitable speakers may assist learners in understanding that the countryside today is a living landscape in which people interact with each other and the environment. Conservation can be achieved only with co-operation between the different users. If possible, a broad discussion of a range of ideas about habitat management would be beneficial to the learners.

Key speakers, such as local countryside rangers, farmers, environmental scientists, industrial based environmental managers, foresters, gamekeepers, researchers, outdoor leisure facility managers, local business managers, waste managers, energy specialists etc may be used to assist in the delivery of this unit.

The theme for the unit is 'developing the sustainable environment' and links very closely with Level 3 Unit 7: Sustainable management and development of resources, and Level 3 Unit 8: Global impacts and the Environmental and Land-based sector.

This unit contributes to this theme by developing skills and knowledge to enable learners to explore and measure the scientific factors that underpin current issues in the sustainable management of environmental resources. Learners will develop an understanding of the impacts of changing natural processes on commercial systems in the Environmental and Land-based sector.

Benefits can be obtained by using some of the data and monitoring techniques used in this unit across the other units within the theme.

Benefits can also be obtained by selecting appropriate teaching and learning strategies eg co-teaching or using the data from this unit as the basis for further work and creating a single purposeful activity. In particular, the practical aspects will develop handling and recording skills and, in some instances, the same habitats could be used for both this unit and Level 3 Unit 1: The ecology of the natural environment and the importance of biodiversity.

## Opportunities for applied learning

This unit enables the learners to apply their knowledge and to develop their report writing skills by completing an Environmental Impact Assessment. They will also further develop their field survey skills and techniques.

They will be able to carry out research to:

- understand why environmental evaluation may be necessary
- produce primary data
- interpret and assess the validity of secondary data
- identify risks to surveyor and habitat and the ways in which they can be minimised
- analyse data using computer packages
- evaluate a habitat
- provide unbiased recommendations for proposed developments or changes to a habitat.

## Suggested prior learning

Learners will need to have basic knowledge of plant and animal species. Knowledge gained from studying Level 1 Unit 1: The natural environment, and Level 2 Unit 7: Monitoring the environment would be beneficial. Utilisation of plant and animal species will be developed further in this unit.

## Personal, Learning and Thinking Skills

The list below is indicative of the way this unit supports the development of PLTS, as opposed to the achievement of PLTS that are possible through the assessment. The unit supports the development of more PLTS than are covered through the Assessment criteria alone.

Alternative approaches could be selected.

The learner could develop PLTS by:

### Independent enquirers

- planning and carrying out research using data gained from both primary and secondary sources

### Creative thinkers

- exploring the range of research methods and selecting those most appropriate to evaluate the habitat

### Reflective learners

- evaluating research findings to reach a decision about the proposed environmental or land use changes

### Self-managers

- organising time and resources in their production of work to ensure deadlines are met

### Effective participators

- presenting and discussing findings with others in small and whole group situations, negotiating and balancing diverse views to reach valid conclusions

### Team worker

- working with others in a co-operative manner to collect relevant data.

## Opportunities for Functional Skills development

This unit and its associated learning activities will provide the learner with opportunities to develop and use English, mathematics and ICT in a number of ways.

The ability to express clearly information with supporting arguments is key to this unit as it is about the purpose and value of conducting environmental evaluations and other types of scientific research. The scope of this type of activity will need to be researched and reported on. Once the activity has been undertaken, the findings will require collation, interpretation and analysis, which could involve mathematical skills and knowledge development in order to draw meaningful conclusions.

If work for this unit is generated electronically, the learner will have the opportunity to develop skills and/or evidence for the Functional Skills in ICT.

## Suggested learning resources

### Books

A range of identification books would be very useful when carrying out environmental analysis.

Jahns, H. M. (1983). *Guide to the Ferns, Mosses and Lichens of Britain and Northern and Central Europe*. Published: Collins. ISBN: 978-0002192545.

Preston, C. D.; Pearman, D. A.; Dines, T. D. (Editors) (2002). *New Atlas of the British and Irish Flora: An Atlas of the Vascular Plants of Britain, Ireland, The Isle of Man and the Channel Islands*. Published: Oxford University Press. ISBN: 978-0198510673.

Rose, F.; O' Reilly, C. (2006). *The Wild Flower Key*. Published: Frederick Warne Publishers Ltd. ISBN: 978-0723251750.

Sutherland, W. J.; Hill, D. A. (1995). *Managing Habitats for Conservation*. Published: Cambridge University Press. ISBN: 978-0521447768.

Stace, C. A. (1997). *New Flora of the British Isles*. Published: Cambridge University Press. ISBN: 978-0521589352.

### Journals and magazines

- The Ecologist
- Environmental Times
- Journal of Ecology

### Websites

- |  |  |
|--|--|
| • Department for Environment, Food & Rural Affairs | <a href="http://www.defra.gov.uk">www.defra.gov.uk</a>                           |
| • The Wildlife Trusts                              | <a href="http://www.wildlifetrusts.org">www.wildlifetrusts.org</a>               |
| • RSPB   | <a href="http://www.rspb.org.uk">www.rspb.org.uk</a>                             |
| • Environmental Agency                             | <a href="http://www.environment-agency.gov.uk">www.environment-agency.gov.uk</a> |
| • FSC (Field Studies Council)                      | <a href="http://www.field-studies-council.org">www.field-studies-council.org</a> |
| • Forestry Commission GB                           | <a href="http://www.forestry.gov.uk">www.forestry.gov.uk</a>                     |
| • BTCV   | <a href="http://www2.btcv.org.uk">www2.btcv.org.uk</a>                           |
| • Soil Association                                 | <a href="http://www.soilassociation.org">www.soilassociation.org</a>             |
| • Natural England                                  | <a href="http://www.naturalengland.org.uk">www.naturalengland.org.uk</a>         |

## 4 Assessment guidance

The following guidance is applicable to all lines of learning and at all levels. The guidance will be available within the specifications and contained in other relevant publications that support Diploma qualifications made available to consortia/centres.

### 4.1 Task setting

#### Guidance

Each internally assessed unit has guidance related to task setting within the Assessment section.

Clear guidance, with exemplars of suitable internal assessment, is available to all consortia centres in order to ensure that suitable tasks are set. AQA-City & Guilds will give extra guidance on task setting through its moderators and they will review a selection of proposed tasks to check that these are suitable at the early advisory visits.

The teacher at a centre with overall responsibility for internal standardisation is also responsible for the standardisation of task setting.

Guidance is provided on the total amount of time that a task should take, on the amount of time that specific activities within a task should take and on the form of supervision expected.

The Assessment structure within each unit clearly states what must be covered in the assessment and must be used in order to set appropriate assignments. The units also give details of the demand expected in each assessment task and the overall sector purpose that must be adhered to.

The Weighting of Learning outcomes in relation to marking should also be used as guidance in task setting, so that teachers can allocate appropriate depth and breadth to different areas of the assignment.

#### Moderation

All centres will receive an early visit by their moderator, which will include guidance on assignment/task setting for internally set and marked units. This visit will also include guidance on marking.

Centres will also receive detailed feedback following moderation of any units, which includes appropriateness of the task set.

### 4.2 Task taking

#### Internal assessment

##### Control criteria for internally assessed assignments

The internal assignments must all be taken using controls where appropriate. The forms of evidence required in a unit will drive the controls needed. The following controls should be in place for certain forms of assessment. Where there is specific guidance required beyond that stated below, it will be found in the Assessment section of the unit concerned.

Form of evidence	Method of control									
	Attendance by moderator or Video/DVD recording	Photographs to confirm individual work or product	Witness statement	Bibliography or list of sources	Signed notes evidencing questions asked by teacher	Transcript or audio recording	Log or journal event/business with financial record if applicable	Learner's own record	Supervision	Submission of artefact or product
Performance	1		2							
Research of relevant sources of material				1	2					
Record of interviews with business, industry or third party representatives			2 with learner's own record			1 with evidence of permission		2 with witness statement		
Artefact or Production	2	2	2			2			1*	1*
Practical assignment/experiment	2	2	2			2			1*	1 if possible
Set up and run an event or business			3				2	2	1*	
Portfolio of evidence										1*
Presentation of ideas			2			1				
Report					2 where applicable					1*
Career plan/personal development plan										1*
Witness statement										1*
Job application										1*

**Please note:**

Control methods rated 1 must be used. Those rated 2 may be used if employing the favoured method is not practical and has been agreed with the centre's moderator. They may also be used as a way of providing additional evidence of the learner's having met the Assessment criteria. Those rated 3 are optional forms of control that may be employed.

\*Where the number 1 is followed by an asterisk, this indicates that any other control methods may accompany but not substitute the use of this method.

4

## Supervision of learners' work

Learners' work for assessment should be carried out under direct supervision when this is appropriate to the task. Some items of work must use direct supervision as per the controls table. Where direct supervision is not practical the table above shows the controls that would need to be in place and therefore allow the teacher to authenticate that the work is the learner's own.

All learners must sign that the work submitted is their own and teachers/assessors must confirm that the work assessed is solely that of the learner concerned and was conducted under the conditions required by the specification.

## Guidance by the teacher

The work assessed must be solely that of the learner concerned. Any assistance given to an individual learner which is beyond that given to the group as a whole must be recorded.

## External assessment

### Timing of external assessments

The external assessments will be timetabled twice a year, in January and June and the dates will be published at the start of the academic year.

## 4.3 Task marking

### Guidance on applying the unit Assessment grid

When assessing learners' work, teachers/assessors should consider the level of attainment demonstrated in four broad areas within the demands and context of the specific unit being assessed:

- the depth and breadth of understanding
- the level of skills
- the level of synthesis, analysis and evaluation
- the level of independence and originality.

In the Assessment grid for each unit, mark ranges are specified for each Learning outcome. When assessing a learner's work, teachers/assessors should use their professional judgement to identify, for each Learning outcome, the mark band description within which that work falls and then the mark within that range that best describes the depth and quality of the work. To achieve the higher mark bands, learners should show greater depth and breadth of understanding, higher level skills, higher levels of synthesis, analysis and evaluation and higher levels of independence and originality. Work that clearly meets all the requirements of the mark band description should be awarded the maximum mark identified.

Aspects of the work that might fall short of meeting the description in full, but which do not, in the judgement of the teacher/assessor sufficiently influence the overall level of achievement to merit the work being assigned to a lower mark band, will reduce the mark awarded within the identified range available. This can be expressed as identifying the 'best-fit' approach, where the areas of strength in the work submitted by the learner can be allowed to compensate for weaknesses in other areas.

Assessors will use archived exemplars as they become available as a reference point. By comparing their own learners' work with archive work which has an assessment commentary attached, the assessor will be able to position the work either on a higher or lower point.

Moderators will also use exemplar work in their early advisory visits to consortia/centres to aid in the consistent application of the marking grids.

## Assessment of group work

Group work is a useful way of obtaining information for some activities but it is important that individual learners meet the Assessment criteria requirements. Teachers/assessors assessing the evidence will need to be convinced of its individual authenticity. Questioning can be used in order to clarify the validity, authenticity and sufficiency of evidence and, under these circumstances, the teacher/assessor may wish to include a dated witness statement detailing this evidence. It is expected that the use of such statements will be kept to a minimum so that they constitute a very minor part of the submitted evidence.

Annotation of written/photographic evidence can also be used to detail an individual's contribution.

It is recognised that there can be instances where learners are required to carry out tasks as part of a group and the group-working skills are an integral part of the assessment requirements. In such cases this general guidance on group work will be superseded by the specific requirements and instructions of the individual unit(s).

## Internal standardisation of marking

The centre is required to standardise the assessment across different teachers and teaching groups, within and across units, to ensure that all work at the centre has been judged against the same standards. If two or more teachers are involved in marking units, one teacher must be designated as responsible for internal standardisation.

Common pieces of work must be marked on a trial basis and differences between assessments discussed at a training session in which all teachers involved must participate.

The teacher responsible for standardising the marking must ensure that the training includes the use of reference and archive materials such as work from a previous year or examples provided by AQA-City & Guilds. The centre is required to send to the moderator a signed Centre Declaration Sheet (confirming that the marking of work at the centre has been standardised). If only one teacher has undertaken the marking, that person must sign this form.

## Claiming and moderation of internal assessment

Claiming and moderation of internal assessment will only be available in the summer term at fixed dates that will be published at the start of the academic year.

## Unfair practice

At the start of the course, the supervising teacher is responsible for informing learners of the AQA-City & Guilds Regulations concerning malpractice. Learners must not take part in any unfair practice in the preparation of work to be submitted for assessment, and must understand that to present material copied directly from books or other sources, without acknowledgement, will be regarded as deliberate deception. Centres must report suspected malpractice to AQA-City & Guilds.

## Authentication of learners' work

Both the learner and the teacher are required to sign declarations confirming that the work submitted for assessment is the learner's own. The teacher declares that the work was conducted under the specified conditions and records details of any additional assistance.

Work other than that of the learner can be utilised in coursework for research and reference, but must be fully acknowledged.

## Malpractice

Learners must **not**:

- submit work which is not their own
- lend work to other learners
- allow other learners access to, or the use of, their own independently-sourced source material (this does not mean that learners may not lend their books to another learner, but learners should be prevented from plagiarising other learners' research)
- include work copied directly from books, the internet or other sources without acknowledgement and attribution
- submit work typed or word-processed by a third person without acknowledgement.

These actions constitute malpractice, for which a penalty (eg disqualification from the examination) will be applied.

If malpractice is suspected, the Examinations Officer should be consulted about the procedure to be followed.

Where suspected malpractice in coursework/portfolios is identified by a centre after the learner has signed the declaration of authentication, the Head of Centre must submit full details of the case to AQA-City & Guilds at the earliest opportunity. The form JCQ/M1 should be used. Copies of the form can be found on the JCQ website ([www.jcq.org.uk/](http://www.jcq.org.uk/)).

Malpractice in coursework/portfolios discovered prior to the learner signing the declaration of authentication need not be reported to AQA-City & Guilds, but should be dealt with in accordance with the centre's internal procedures. AQA-City & Guilds would expect centres to treat such cases very seriously. Details of any work which is not the learner's own must be recorded on the coursework/portfolio cover sheet or other appropriate place.

## Moderation

A moderator will be assigned to each consortium for each line of learning. The moderator, through AQA-City & Guilds' processes check the setting, taking and marking of internal assessments.

Moderation has two stages. The first is the technical advisory visit to check matters such as coverage of applied learning, understanding of controlled conditions, coverage of PLTS and arrangements for internal standardisation, including use of the marking grids. There is also a requirement at the advisory visits for moderators to see examples of assessment tasks that will be used for internal assessment.

The second stage of moderation is to check the taking and marking of assessments. This stage will take place at fixed times in the academic year, and may be through postal moderation or through a visit to a consortia/centre. This will depend on the line of learning and the type of evidence submitted. The moderator will review a sample of units and the marks awarded by the consortium, in line with national standards. The consortium may be asked to review its marking following this process. In extreme cases, the work of all learners will be re-marked by the moderator.

## 5 Administration

### 5.1 Availability of Principal Learning units

All internally assessed Principal Learning units for this specification are available to claim once a year in June, commencing 2010. External assessments will be timetabled twice a year, in January and June, and the dates will be published at the start of the academic year.

### 5.2 Centre registration

Centres wishing to prepare learners for this specification should apply for approval to offer Principal Learning before teaching begins. Completed application forms should be submitted to Centre Registration, AQA, Stag Hill House, Guildford, Surrey, GU2 7XJ. Applications can only be considered from centres which have received approval through the Gateway process to offer Level 3 Principal Learning in Environmental and Land-based Studies. Further details of the approval process are available on the website at: [www.diplomainfo.org.uk](http://www.diplomainfo.org.uk)

### 5.3 Centre requirements

#### Resources

Centres must have access to sufficient equipment in the centre or in other centres within the consortium to ensure that learners have the opportunity to cover all the practical activities. Any requirement for specialised equipment is to be found in the description of the units themselves.

#### Health and safety

The importance of safe working practice and the demands of the Health and Safety at Work Act 1974 must be stressed to all learners. Learners have responsibilities for maintaining the safety of others as well as their own. Anyone behaving in an unsafe fashion must be stopped and a suitable warning given by the teacher responsible. It is essential that all learners acquire habits required to promote health and safety in the workplace and that their learning avoids potentially unpleasant or dangerous consequences.

#### Centre staff

Centre staff should be technically competent in all the areas for which they are delivering education and training and/or should also have relevant experience of providing the necessary practical training.

#### Continuing Professional Development (CPD)

Centres are expected to support their staff in ensuring that their knowledge and skills in the vocational area remain current and take account of any national or legislative developments.

## 5.4 Entries

Please refer to the current version of Entry Procedures and Codes for up-to-date entry procedures. You should use the following entry codes for the Principal Learning units:

Unit 1 (ELS3U1)

Unit 2 (ELS3U2)

Unit 3 (ELS3U3)

Unit 4 (ELS3U4)

Unit 5 (ELS3U5)

Unit 6 (ELS3U6)

Unit 7 (ELS3U7)

Unit 8 (ELS3U8)

Unit 9 (ELS3U9)

## 5.5 Quality assurance

### Internal quality assurance

Registered centres must have effective quality assurance systems to ensure optimum delivery and assessment of qualifications. Quality assurance includes initial centre registration by AQA-City & Guilds and the centre's and/or consortium's own internal procedures for monitoring quality. Centres are responsible for internal quality assurance and AQA-City & Guilds is responsible for external quality assurance.

National standards and rigorous quality assurance are maintained by the use of:

- AQA-City & Guilds external examinations
- AQA-City & Guilds externally set briefs or assignments
- internal quality assurance
- AQA-City & Guilds external moderation.

To meet the quality assurance criteria for this qualification, the centre must ensure that the following procedures are followed:

- the setting of appropriate tasks (see Section 4.1)
- the application of appropriate control of tasks (see Section 4.2)
- training in the use of the Assessment grid (see Section 4.3)
- completion by the person responsible for internal standardisation of the Centre Declaration Sheet to confirm that internal standardisation has taken place (see Section 4.3)
- the completion by learners and teachers/assessors of the record form for each learner's work (see Section 4.3).

## External quality assurance

External quality assurance is provided by the two stage moderation system described in Section 4.3. External moderation of internally assessed work is carried out to ensure that assessment is valid and reliable, and that there is good assessment practice in centres and that national standards are maintained.

In order to carry out their quality assurance role, external moderators must have appropriate teaching and vocational knowledge and expertise. AQA-City & Guilds will appoint external moderators and will ensure that they attend regular training and development meetings designed to keep them up-to-date, to ensure standardisation of all assessments and to share good practice.

External moderators:

- provide advice and support to staff in centres
- ensure the quality and consistency of assessments within and between centres and over time by the use of systematic sampling
- regularly visit centres to ensure that they continue to meet the centre registration requirements of AQA-City & Guilds
- provide feedback to centres and to AQA-City & Guilds.

In order to monitor compliance with JCQ requirements, particularly for administering external tests, JCQ inspectors will regularly visit centres.

AQA-City & Guilds requires the Head of Centre to:

- facilitate any inspection of the Centre which is undertaken on behalf of AQA-City & Guilds
- make secure arrangements to receive, check and keep examination material secure at all times, maintain the security of AQA-City & Guilds confidential material from receipt to the time when it is no longer confidential and keep scripts secure from the time they are collected from the learners to their despatch to AQA-City & Guilds.

## 5.6 Irregularities

Centres must inform AQA of any irregularity, including any learner who arrives late for a test. For detailed instructions please refer to the current JCQ *Instructions for Conducting Examinations* which is available to view or to download from the JCQ's website:

**[www.jcq.org.uk](http://www.jcq.org.uk)**

## 5.7 Awarding grades and reporting results

The Advanced Diploma in Environmental and Land-based Studies will be reported on a six-grade scale: A\*, A, B, C, D and E. Learners who fail to reach the minimum standard for grade E will be recorded as U (Unclassified) and will not receive a qualification certificate.

The Principal Learning and Level 3 Extended Project will be graded separately and will use the same grading system as the Diploma. Principal Learning and the Level 3 Extended Project will be separately certificated but learners will not receive individual certificates for units of Principal Learning.

## 5.8 Certification of the Diploma

AQA-City & Guilds is a registered Diploma Awarding Body and will certificate the Diploma in accordance with the requirements and timetable to be published separately by QCA. AQA conducts the administration of the Principal Learning units for this specification on behalf of AQA-City & Guilds.

## 5.9 CABs, DABs and the Diploma aggregation service

AQA is recognised as a Component Awarding Body and offers the widest range of GCE and GCSE qualifications of any unitary awarding body in the UK. These are listed in QCA's Diploma Catalogue. Similarly, City & Guilds is recognised as a Component Awarding Body and offers the widest range of NVQ, VRQ and City & Guilds' own brand qualifications, which are listed in QCA's Diploma Catalogue.

AQA-City & Guilds has been recognised as a Component Awarding Body to certificate Environmental and Land-based Studies Principal Learning and Project qualifications for Diplomas.

AQA-City & Guilds has been recognised as a Diploma Awarding Body by QCA in order to certificate whole Diploma qualifications for the Diploma in Environmental and Land-based Studies at all three levels.

Learners who have registered for Diploma awards with AQA-City & Guilds will on completion receive a Diploma certificate and a Diploma transcript. The transcript will conform to QCA's specification in terms of the design and information included. The data for the transcript will be supplied by the Diploma aggregation service which is designed to enable the data sharing, results aggregation and grading supporting functions required for the operation of the Diploma as a composite qualification.

## 5.10 Enquiries about results

The services available for enquiries about results include a clerical check, re-mark of external assessments and re-moderation of internally assessed work. Requests must be submitted within the specified period after the publication of results for individual assessments.

In cases where a post-results enquiry reveals inaccurate assessment, the result may be confirmed, raised or lowered.

For further details of enquiries about results services, please consult the current version of the JCC *Post-Results Services* booklet.

## 5.11 Re-sits and shelf-life of unit results

Unit results remain available to count towards certification, whether or not they have already been used, as long as the specification is still valid.

Learners may re-sit a unit any number of times within the shelf-life of the specification. The best result for each unit will count towards the final qualification.

Learners will be graded on the basis of the work submitted for assessment.

## 5.12 Access arrangements and special consideration

We have taken note of the provisions of the Disability Discrimination Act (DDA) 1995 in developing and administering this specification.

We follow the guidelines in the Joint Council for Qualifications (JCQ) document: *Regulations and Guidance Relating to Candidates who are Eligible for Adjustments in Examination GCSE, GCE, GNVQ, AEA, Entry Level, Basic Skills & Key Skills Access Arrangements and Special Consideration*. This is published on the JCQ website:

**[www.jcq.org.uk/access\\_arrangements/](http://www.jcq.org.uk/access_arrangements/)**

or you can follow the link from our website:

**[www.aqa.org.uk/admin/p\\_special\\_3.html](http://www.aqa.org.uk/admin/p_special_3.html)**

### Access arrangements

We can make arrangements so that learners with disabilities, special educational needs and temporary injuries can access the assessment. These arrangements must be made **before** the examination. For example, we can produce a Braille paper for a learner with visual impairment.

### Special consideration

We can give special consideration to learners who have had a temporary illness, injury or indisposition at the time of the examination. Where we do this, it is given **after** the examination.

Applications for either access arrangements or special consideration should be submitted to AQA-City & Guilds by the Examinations Officer at the centre.

## 5.13 Language of examinations

We will provide units for this specification in English only.

## 5.14 Qualification titles

The qualification based on this specification is:

AQA-City & Guilds Level 3 Principal Learning in Environmental and Land-based Studies.

# Appendix A

## Connections to other qualifications

The Advanced Diploma in Environmental and Land-based Studies incorporates the following qualifications:

### **Functional Skills qualifications in English, mathematics and ICT**

For details of the AQA Functional Skills specifications please go to:

**[www.aqa.org.uk/qual/gcse/functional\\_skills.php](http://www.aqa.org.uk/qual/gcse/functional_skills.php)**

For details of the City & Guilds Functional Skills specifications please go to:

**[www.cityandguilds.com/functionalskills](http://www.cityandguilds.com/functionalskills)**

### **The Level 3 Extended Project qualification**

For details of the AQA-City & Guilds Level 3 Extended Project specification go to:

**[www.diplomainfo.org.uk/aboutdiplomas/projects.html](http://www.diplomainfo.org.uk/aboutdiplomas/projects.html)**

## Appendix B

### Additional and Specialist Learning for the Advanced Diploma in Environmental and Land-based Studies

The complete list of accredited qualifications which has been recognised as eligible for Additional and Specialist Learning for the Advanced Diploma in Environmental and Land-based Studies is published on the National Database of Accredited Qualifications. Visit:

**[www.accreditedqualifications.org.uk](http://www.accreditedqualifications.org.uk)**

AQA and City & Guilds qualifications which have been recognised as eligible for Additional and Specialist Learning for the Diploma in Environmental and Land-based Studies are also published on:

**[www.diplomainfo.org.uk](http://www.diplomainfo.org.uk)**

# Appendix C

## Other issues

### European Dimension

AQA-City & Guilds has taken account of the 1988 Resolution of the Council of the European Community in preparing this specification and associated specimen units.

### Environmental Education

AQA-City & Guilds has taken account of the 1988 Resolution of the Council of the European Community and the Report *Environmental Responsibility: An Agenda for Further and Higher Education* 1993 in preparing this specification and associated specimen units.

### Avoidance of Bias

AQA-City & Guilds has taken great care in the preparation of this specification and specimen units to avoid bias of any kind.







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**Level 3 – Principal Learning**

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