Qualifications and Curriculum Authority

Criteria for the Diploma qualifications in environmental and land-based studies at levels 1, 2 and 3

Version 2

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Contents

Purpose

The purpose of this document is to record a full set of criteria for principal learning for the Diploma in environmental and land-based studies at levels 1, 2 and 3. It also sets out the aims for the overall Diploma in environmental and land-based studies.

This document should be read in conjunction with the Qualifications and Curriculum Authority (QCA) document *Criteria for accreditation of Diploma qualifications at levels 1, 2 and 3* (QCA/07/3112) at www.qca.org.uk/diploma/regulation/, which defines the overarching criteria for all Diplomas at level 1, 2 and 3, and the *Line of Learning statement in environmental and land-based studies* produced by the Diploma development partnership (DDP) representing the industries covered.

All references to guided learning hours (GLH) within this document are for the purposes of ensuring that, at each level, there is sufficient content specified to enable the design of qualifications. GLH are not intended to indicate final unit sizes or design.

The purpose of the Line of Learning criteria is twofold:

- to provide the regulatory tools (alongside the overarching criteria) which the QCA will use to accredit qualifications that are developed for the Diploma and to admit qualifications and/or units of accredited qualifications into the Diploma catalogue
- to specify the requirements against which awarding bodies will develop their units and/or qualifications for the Diploma and submit qualifications and/or units of accredited qualifications for the Diploma catalogue.

Aims

The general aims of the Diplomas are identified in Section 2 of the document *Criteria for accreditation of Diploma qualifications at levels 1, 2 and 3.*

The Diploma in environmental and land-based studies is for all learners, and has particular relevance to 14–19-year-old learners who seek to acquire knowledge and understanding and develop skills in the broad context of the environmental and land-based sector.

The purpose of the Diploma in environmental and land-based studies at levels 1, 2 and 3 is to introduce learners to the world of the environmental and land-based sector.

Principal learning provides the essential knowledge, skills and understanding for all learners within the sector(s) covered. Specialist learning enables learners to acquire a deeper understanding and/or application of the topics covered in principal learning or to explore a related topic with a more local focus.

Each Diploma in environmental and land-based studies will:

- enable learners to gain informed and engaging access to the sector
- enable student to make informed choices about careers and progression within the environmental and land-based sector
- contribute to meeting the needs and raising the profile of the environmental and land-based sector
- enable learners to apply knowledge and understanding and develop the practical skills required by the environmental and land-based sector
- give opportunities to practise and acquire essential functional skills in English, mathematics and information and communication technology (ICT), which are relevant to the level and delivered in the context of the environmental and land-based sector
- enable individuals to acquire relevant personal, learning and thinking skills (PLTS) in an environmental and land-based context
- offer progression to other Diplomas, to transfer laterally and progress to further education, apprenticeships and training
- aid effective transition to further education, work-based learning or higher education and to working life

- provide a motivating learning experience for individuals, through a blend of general education and applied learning within a coherent and stimulating programme.

Diversity and inclusion

Diplomas will enable all learners to be assessed by means of internal and external assessment, differentiating only on the basis of candidates' abilities to meet the assessment requirement. Diplomas will use plain language that is free from bias and there will be no covert or overt discrimination in wording or content. There must be fair and equal access to the Diploma for a diverse range of learners, so that all can benefit from the high quality applied learning in employability skills, knowledge and understanding that it provides.

Component awarding bodies must design assessment requirements so that there are no barriers to achievement for disabled people, unless the barrier is explicitly justified as a competency standard in line with the *Criteria for the Diploma qualifications in environmental and land-based studies at levels 1,2 and 3*. There must also be no barriers to achievement in the assessment requirements in terms of gender, race, age, sexual orientation and religion/belief.

The development of principal learning qualifications and all associated tasks of assessment, awarding and appeal, must take into consideration the needs of all potential learners to ensure there are no barriers in terms of disability, gender, race, age, sexual orientation and religion/belief. In particular, they should minimise any later need to make reasonable adjustments for disabled learners. This includes the design of information and communication hardware and software, and the formatting of communication in hard copy or online. Reasonable adjustments for disabled people must be offered where these are still needed. Reasonable adjustments should reflect the candidate's usual methods of working and not invalidate the competency standard of the assessment requirements.

Component awarding bodies may allow assessment in British Sign Language. Where more than one language is used, the awarding body must put adequate mechanisms in place to guarantee the consistency of assessment across the different languages.

To support the requirements above, component awarding bodies must have procedures in place to ensure relevant staff and associates are trained in ensuring equality in the design, development and subject matter of qualifications, assessment and awarding procedures, language used in assessment, and systems used to ensure consistency of standards across options, centres and time. They must also ensure that the centres they register do the same and undertake to use buildings that provide access for all candidates in accordance with equalities legislation.

The Diploma qualification must include the identification of opportunities, if appropriate to the subject or sector, for developing understanding of spiritual, moral, ethnical, social, legislative, economic and cultural issues.

Notes

The six areas of diversity in law are disability, gender, race, age, sexual orientation and religion/belief. In addition, QCA's regulation promotes equality and aims to eliminate discrimination in terms of disability, gender and race, in accordance with public sector equality duties.

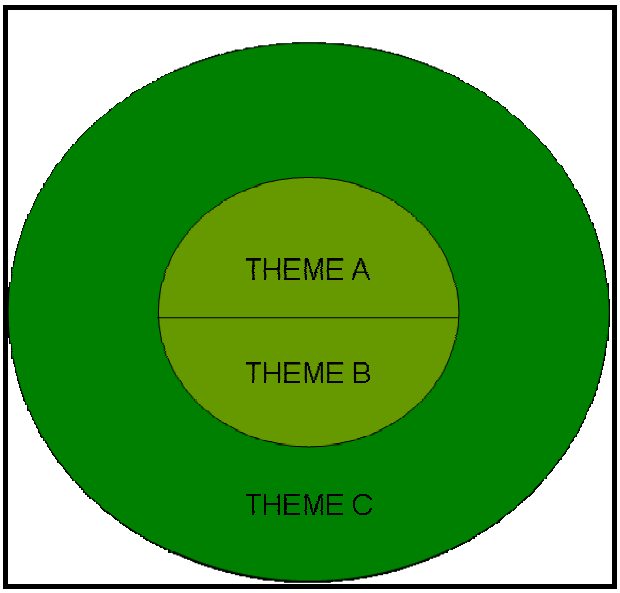
Structure

Structure of Diplomas in environmental and land-based studies			
Level	**1**	**2**	**3**
Total GLH	**600**	**800**	**1080**
Principal learning (GLH)	**240**	**420**	**540**
Generic learning (GLH)	**240**	**200**	**180**
Additional and specialist learning (GLH)	**120**	**180**	**360**

Themes

The Diploma in environmental and land-based studies is structured around the same three themes at each level. These themes indicate the structure and diversity of the environmental and land-based sector.

Central to the sector and the structure of the Diploma are the natural resources of our environment. The ways in which we use these resources are explored through Themes A and B. Wrapping around all of this is the need for the sustainable use of the environment and how this can be achieved (Theme C). Arising from the interdependency of plants, animals and the environment, all three themes are represented within and across the topics.



Theme A The productive and working environments

Central to this theme are the components and finite resources of our natural environment, the influences upon them, how they influence us and how these resources are used. The environmental and land-based sector accounts for a large portion of jobs and wealth generation in the national and global economy. This theme will also explore the value of the sector, the diversity of the jobs it offers and the practical skills required by environmental and land-based employers.

Theme B Plants and animals

Plants and animals are an integral part of our environment and the land-based sector. We use plants for commercial, recreational and conservation purposes and animals for production (food), recreation, work or companionship. The theme will also consider the care of plants and the care and welfare of animals, and show how their interdependency is manifest in wildlife, recreational and commercial resources. Where reference is made to wild animals, this covers those living in the wild. Domesticated refers to animals cared for by humans for a wide range of uses including production, companionship, recreation and those kept in captivity.

Theme C Developing the sustainable environment

This theme will explore the impact of people and businesses on our environment, the importance of the sustainable use of our finite resources and how sustainable practices can be implemented. The role of people and organisations and the tools and techniques used to monitor and analyse our environments are also investigated.

Level 1 Summary of themes and topic titles

Themes and topics	GLH
Theme A The productive and working environments	
Topic 1.1 Components of the natural environment	30
Topic 1.2 Environmental and land-based production, systems and services	30
Topic 1.3 Introduction to working in the environmental and land-based sector	30
Theme B Plants and animals	
Topic 1.4 Working with plants and animals	60
Topic 1.5 Introducing the role and value of plants and animals	30
Theme C Developing the sustainable environment	
Topic 1.6 Impacts on the environment	60

Topics 1.2, 1.3 and 1.4 are compulsory for all learners taking the environmental and land-based Diploma. Centres may choose which other topics they take from the principal learning to make up the required minimum 75 per cent.

Topic 1.4 is the elective topic for learners taking another Diploma line wishing to take a topic from the environmental and land-based Diploma.

Topic 1.1 Components of the natural environment (30 GLH)

Purpose

This topic introduces learners to:

- the key components of and habitats in land-based and aquatic environments
- the influence of weather on the environment
- soil types
- basic systems used to identify aspects of the environment.

Scope of content

Learners must know and understand:

1. the key factors that affect the growth and distribution of plants and animals in an ecosystem
2. the range of common land and aquatic species and habitats
3. that animals and plants are linked in a feeding web
4. that seasonal weather patterns and climate affect species and habitats
5. soil types, their main components and their importance in land use.

Learners must be able to:

1. identify a range of land-based and aquatic habitats
2. use basic keys to identify plants and animals
3. identify common soil types and carry out basic soil tests
4. carry out basic weather observations.

In order to engage with this topic effectively, learners must use the following PLTS:

- independent enquirers
- self-managers.
- effective participators.

Topic 1.2 Environmental and land-based production, systems and services (30 GLH)

Purpose

This topic introduces learners to:

- the meaning of the terms ‘land use’ and ‘production’ in the environmental and land-based sector
- how humans affect environments over time
- how the use of wild and/or cultivated plants and wild and/or domesticated animals creates different land uses and production systems
- key systems, services and procedures that generate different land uses

Scope of content

Learners must know and understand:

1. the common natural and human-induced production systems in the environmental and land-based sector
2. the types of wild and/or cultivated plants and wild and/or domesticated animals used in land-use systems and the resultant products
3. the systems and services that result from different types of human influence, including commercial food production, recreation and leisure management, wildlife and conservation, resource extraction
4. the reasons for the location of different land use and production systems and services
5. what records need to be kept of natural and/or human-influenced systems and services

Learners must be able to:

1. identify the key features of a natural and a human-influenced land use and/or production system
2. use basic methods to identify and record plants and/or animals within a land use or production system

In order to engage with this topic effectively, learners must use the following PLTS:

- independent enquirers
- self-managers
- creative thinkers.

Topic 1.3 Introduction to working in the environmental and land-based sector (30 GLH)

Purpose

This topic introduces learners to:

- jobs, training and qualifications for those who wish to work or volunteer in the environmental and land-based sector
- the personal skills and qualities required to work in the environmental and land-based sector
- the importance of health and safety
- the need to review one's strengths and weaknesses.

Scope of content

Learners must know and understand:

1. the range of jobs available in the environmental and land-based sector, what they involve and the training and qualifications available
2. the personal skills required for work in the environmental and land-based sector
3. the importance of effective teamwork and clear communication in an environmental and land-based job.
4. the range of common tools and equipment used in the environmental and land-based sector, their uses and how to transport, store and maintain them
5. common hazards, the risks of working in the environmental and land-based sector and the processes, obligations and responsibilities of employers and employees to minimise them.

Learners must be able to:

1. complete an application for an environmental or land-based job
2. behave responsibly in a workplace
3. undertake and keep a log of activities undertaken and tools used in an appropriate workplace
4. review own strengths and weaknesses in at least one specific role

5. contribute to identifying health and safety risks and meeting environmental requirements.

In order to engage with this topic effectively, learners must use the following PLTS:

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

Topic 1.4 Working with plants and animals (60 GLH)

Purpose

This topic introduces learners to:

- the importance of wild/cultivated plants and wild/domesticated animals
- caring for plants and animals
- common plant and animal pests and diseases
- the safe use of tools and machinery when working with plants and animals.

Scope of content

Learners must know and understand:

1. the physical and environmental conditions needed for the growth of plants and animals in natural and managed environments
2. why good plant husbandry is required; the importance of routine and non-routine care, common failings and how they can be avoided
3. why animals need food, water, health care, housing and good environmental conditions (the five freedoms) and how this is provided, including the duty of care
4. the conditions required for plants and/or animals to reproduce and grow
5. basic after-care of plants and animals
6. common plant and animal diseases.

Learners must be able to:

1. identify common types of wild and cultivated plants and wild and domesticated animals
2. prepare, propagate, plant, water, containerise, feed, mulch and apply post-planting care for a selection of plants
3. care for a selection of animals so that they meet the basic requirements of the five freedoms
4. identify and record signs of health and illness in a range of plants and/or animals

In order to engage with this topic effectively, learners must use the following PLTS:

- independent enquirers
- creative thinkers
- effective participators.

Topic 1.5 Introducing the role and value of plants and animals (30 GLH)

Purpose

This topic introduces learners to:

- the range of plants and animals related to commercial and recreational use
- the value of wild and cultivated plants
- the value of wild and domesticated animals
- habitat biodiversity and the impact of mono-culture.

Scope of content

Learners must know and understand:

1. how the use of wild and/or cultivated plants can benefit society
2. how wild and/or domesticated animals can benefit society
3. how the relationship between environmental factors, plants and animals leads to different landscapes and land uses – including green spaces, wildlife, recreational and commercial production
4. the role of plants and animals in the food chain
5. the basic implications for the biodiversity of a habitat of monoculture production
6. the potential hazards to plants and animals from human impact.

Learners must be able to:

1. identify the plants and animals making up a food chain, habitat or ecosystem
2. record, present and store the results of investigations

In order to engage with this topic effectively, learners must use the following PLTS:

- independent enquirers
- creative thinkers.

Topic 1.6 Impacts on the environment (60 GLH)

Purpose

This topic introduces learners to:

- basic principles of sustainability and the importance of the sustainable use of the environment
- human uses of and impacts on the natural world and their implications for future-friendly living
- how these impacts are regulated and measured.

Scope of content

Learners must know and understand:

1. the importance of the sustainable use of land and aquatic habitats and how it is encouraged at a local and a global scale
2. how people and businesses use, interact with and impact on the environment on a local and global scale
3. how the impact of human activities on a natural habitat can be minimised to encourage future-friendly living
4. how climatic change impacts on and is affected by the environmental and land-based sector on a local and global scale
5. products and services sourced from an environment
6. the importance of renewable energy sources and how they are being developed
7. common sources and types of pollution and their impacts
8. how waste is managed and/or recycled
9. how access to the countryside is facilitated and restricted
10. the general principle that environmental and planning legislation protects the environment.

Learners must be able to:

1. assess how different parts of a habitat are used by people

2. carry out a simple energy audit

3. identify the potential sources and types of pollution in a habitat

4. identify the impact of people and/or businesses on an environment

5. use monitoring equipment in a safe and effective manner.

In order to engage with this topic effectively, learners must use the following PLTS:

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

Level 2 Summary of themes and topic titles

Themes and topics	GLH
Theme A The productive and working environments	
Topic 2.1 Environmental influences upon ecosystems and production zones	60
Topic 2.2 Working in environmental and land-based organisations	60
Theme B Plants and animals	
Topic 2.3 Plant nutrition, growth and breeding	60
Topic 2.4 Animal nutrition, growth and breeding	60
Topic 2.5 Plants and animals and their role in society	60
Theme C Developing the sustainable environment	
Topic 2.6 The importance of a sustainable environment to society	60
Topic 2.7 Environmental monitoring	30
Topic 2.8 Sources and uses of energy	30

Topic 2.1 Environmental influences upon ecosystems and production zones (60 GLH)

Purpose

The purpose of this topic is to explore:

- the range of factors that influence the environment, plants, animals and related land-based enterprises
- the interdependency of plants and animals, how they are identified and how they adapt to their environment
- topography, climate and weather and their significance to environmental and land-based organisations.

Scope of content

Learners must know and understand:

1. the relationship between the physical characteristics of a landscape and the plant and animal communities that live there
2. the interdependency of plants and animals, how they adapt to their environments and why the equilibrium changes
3. the principles of biodiversity and succession in land-based and aquatic ecosystems
4. the role of microorganisms in ecosystems, including in nutrient cycles and decomposition
5. the influence of topography, climate (including microclimate), weather, soil and the hydrological cycle on plants, animals and the location of related enterprises
6. potential impacts of climatic change on plant and animal species, communities and habitats
7. basic testing, recording, monitoring and forecasting techniques used in environmental and land-based organisations.

Learners must be able to:

1. identify and classify common wild and cultivated plants and/or wild and domesticated animals
2. use a variety of techniques to record information accurately
3. measure and interpret information on a range of natural environmental influences on a habitat or ecosystem

4. collect, record and interpret weather data

In order to engage with this topic effectively, learners must use the following PLTS:

- independent enquirers
- creative thinkers
- self-managers.

Topic 2.2 Working in environmental and land-based organisations (60 GLH)

Purpose

The purpose of this topic is to explore:

- the range of organisations that make up the environmental and land-based sector
- the range of products and services sector organisations offer and how this continues to change
- the jobs, career pathways and progression opportunities available
- the skills required to work safely in the environmental and land-based sector
- health and safety and legislative responsibilities of employers and employees.

Scope of content

Learners must know and understand:

1. the range of enterprises in the environmental and land-based sector, the products and services they offer and the need for competitiveness
2. the changing nature of environmental, land-based and related food businesses
3. the duty of care towards the environment and those plants, animals and humans that occupy it and how this is implemented
4. common hazards when working in the environmental and land-based industries and the health and safety obligations and responsibilities of employees and employers
5. legal and ethical obligations of environmental and land-based employers to their employees and consumers
6. the breadth of job roles, qualifications, training needs and lifelong learning opportunities
7. the personal and workplace skills required by environmental and land-based employers
8. what constitutes good practice in terms of the use, maintenance and storage of tools, materials, equipment and machinery.

Learners must be able to:

1. review own skills and identify training needs for a job in the environmental and land-based industries

2. source and prepare an application for a job within the sector

3. carry out agreed activities safely, effectively and efficiently and support others to meet team goals

4. select, transport, use, store and maintain appropriate tools, materials, equipment and/or machinery.

In order to engage with this topic effectively, learners must use the following PLTS:

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

Topic 2.3 Plant nutrition, growth and breeding (60 GLH)

Purpose

The purpose of this topic is to explore:

- the requirements of wild and cultivated plants throughout their lifecycle
- plant succession
- the growth, breeding and selection of plants
- techniques and safe working practices for feeding, growing and breeding plants.

Scope of content

Learners must know and understand:

1. the principles of plant succession and the role of plants in nutrient cycles
2. the main requirements of plant nutrition, the importance of balanced nutrition, the consequences of poor nutrition and role of fertilizers in commercial production systems
3. how plant nutritional requirements vary between specific breeds, species and stages of growth
4. organisms that cause disease and damage to wild and cultivated plants, their environmental and economic impacts and how they can be managed on a large scale
5. . the principal processing techniques used to prepare plants for human consumption
6. plant breeding and selection and the principles of and ethics behind genetic modification of plants
7. current legislation and codes of practice for governing the growing and breeding of plants

Learners must be able to:

1. plan and implement a balanced and appropriate watering and feeding regime for plants
2. handle plants appropriately
3. identify common pests, diseases and the symptoms of infected wild and cultivated plants; select and apply suitable treatments
4. maintain accurate production records.

In order to engage with this topic effectively, learners must use the following PLTS:

- independent enquirers
- creative thinkers
- effective participators.

Topic 2.4 Animal nutrition, growth and breeding (60 GLH)

Purpose

The purpose of this topic is to explore:

- the requirements of wild and domesticated animals throughout their lives
- the responsibilities of owners and/or managers of wild and domesticated animals
- safe handling of wild and domesticated animals
- key legislation and codes of practice governing animals and their welfare.

Scope of content

Learners must know and understand:

1. how animal feeding behaviour and nutritional requirements vary between breeds, species and stages of growth
2. animal digestive systems and how they vary
3. how commercial animal feeds address nutritional requirements
4. how commercial organisations manage the feeding processes and how they change according to age, stage of growth and environment
5. the genetics behind animal breeding programmes
6. the principles underpinning the five freedoms and animal welfare
7. current legislation and codes of practice governing animals.

Learners must be able to:

1. identify the characteristics of healthy wild and domesticated animals and the signs and symptoms of common animal ill health
2. feed, handle and, where relevant, transport different animals appropriately
3. keep relevant animal nutrition records
4. plan and carry out an appropriate animal care programme.

In order to engage with this topic effectively, learners must use the following PLTS:

- independent enquirers
- self-managers
- creative thinkers
- effective participators.

Topic 2.5 Plants and animals and their role in society (60 GLH)

Purpose

The purpose of this topic is to explore:

- the use of plants and animals for commercial production, recreation and tourism and wildlife conservation purposes
- the use of plants for production, work, recreation and wellbeing
- the use of animals for production, work, companionship, recreation and wellbeing.

Scope of content

Learners must know and understand:

1. the characteristics, role and economic significance of animals used for production, work, companionship and recreation
2. the use of plants in commercial, environmental and amenity situations, the range of associated enterprises, their economic and social importance and their impact on land use and landscape design
3. the value of the association between plant, animal and human interaction and its impact on land use
4. the business, cultural and ethical responsibilities of wildlife and conservation managers, growers and breeders in respect of plants and animals
5. the environmental impact of large-scale plant and/or animal production on ecosystems
6. the processes underpinning plant preparation and humane slaughter of animals to prepare fresh produce for human consumption

Learners must be able to:

1. assess the characteristics of a selection of plants and animals in their role in production and/or recreation and tourism and/or wildlife conservation
2. use appropriate techniques to measure the environmental impact of commercial and/or recreational land use

In order to engage with this topic effectively, learners must use the following PLTS:

- independent enquirers
- creative thinkers
- reflective learners
- self-managers.

Topic 2.6 The importance of a sustainable environment to society (60 GLH)

Purpose

The purpose of this topic is to explore:

- the meaning and value of sustainability
- the uses of the environment and the impacts of environmental activities
- habitat changes and their need for protection
- renewable and non-renewable resources and their role in economic stability
- relevant legislation to protect the environment.

Scope of content

Learners must know and understand:

1. the meaning and value of environmental and economic sustainability
2. how environmental, economic and social factors affect the way water and land is used and designed
3. the basic principles of how resources are managed to assure economic stability and environmental sustainability in the UK and on a global scale
4. the impact of changes in habitat on the animal, plant and human communities using it and habitat protection strategies
5. how human communities and business organisations use and impact on their environment, the value they place on it and the need for community involvement and consensus
6. how to deal with pollution and manage waste from environmental systems
7. key interest groups, their approaches and an introduction to the politics of sustainability
8. current and relevant legislation to protect the environment; its implications, implementation and regulation.

Learners must be able to:

1. identify the impact a human community has on a habitat, species or an ecosystem
2. select and organise an appropriate protection strategy for a habitat or an ecosystem

3. assess how economic and social factors affect land and/or water.

In order to engage with this topic effectively, learners must use the following PLTS:

- independent enquirers
- creative thinkers.

Topic 2.7 Environmental monitoring (30 GLH)

Purpose

The purpose of this topic is to explore:

- why and how the environment is monitored
- the organisations involved in monitoring the environment and ensuring compliance with legislation
- sources of pollution and waste.

Scope of content

Learners must know and understand:

1. the reasons why habitats/environments and species are monitored and the organisations and agencies (including volunteers) involved
2. methods of analysing habitats, the tools required and the significance of scientific method
3. the concept of experimental error and how to minimise it
4. the ways in which environmental monitoring data are used in the planning, design, maintenance and management of environmental schemes
5. the importance of risk-assessing an environmental monitoring programme
6. the need to measure and monitor pollution and waste.

Learners must be able to:

1. profile a habitat
2. carry out a monitoring plan on a local habitat, and/or organism(s) and/or waste
3. risk-assess a monitoring programme
4. use appropriate environmental monitoring methods, techniques and tools
5. interpret and present outcomes in an appropriate environmental brief or report.

In order to engage with this topic effectively, learners must use the following PLTS:

- independent enquirers

- creative thinkers
- reflective learners
- team workers
- self-managers
- effective participators.

Topic 2.8 Sources and uses of energy (30 GLH)

Purpose

The purpose of this topic is to explore:

- current energy sources, uses and the impacts on the environment
- the need for alternative sources of energy
- positive and negative impacts of alternative energy sources.

Scope of content

Learners must know and understand:

1. the current energy supply systems from renewable and non-renewable sources
2. the uses of energy and the need to reduce energy consumption in production, processing and distribution
3. the environmental case for alternative fuels and the way in which energy can be harnessed from the environment
4. the environmental impact of securing future energy supplies to meet increasing demand
5. how energy sources can be managed to minimise pollution
6. the technological, social, economic and environmental factors influencing renewable energy development
7. how global influences affect the UK energy supply
8. the advantages and disadvantages of biofuel production, the arising business opportunities and the impact on the environmental and land-based sector.

Learners must be able to:

1. undertake an energy audit
2. recommend energy efficiency improvements in an environmental or a land-based organisation

In order to engage with this topic effectively, learners must use the following PLTS:

- independent enquirers
- creative thinkers.

Level 3 Summary of themes and topic titles

Themes and topics	GLH
Theme A The productive and working environments	
Topic 3.1 The ecology of the natural environment	30
Topic 3.2 The management of natural resources and resources for production	60
Topic 3.3 Business and enterprise in the environmental and land-based sector	90
Theme B Plants and animals	
Topic 3.4 Applied plant and animal science	60
Topic 3.5 Plants, animals and humans	60
Topic 3.6 Plants and animals: safe working practices and relevant legislation	60
Theme C Developing the sustainable environment	
Topic 3.7 Sustainable development of resources	60
Topic 3.8 Global impacts and the environmental and land-based sector	60
Topic 3.9 Research methods, skills and environmental analysis	60

Topic 3.1 The ecology of the natural environment (30 GLH)

Purpose

The purpose of this topic is to explore:

- basic ecological principles
- the dynamic nature of ecosystems
- the importance of biodiversity.
- the effects of natural and managed activity on soil, water and the environment

Scope of content

Learners must know and understand:

1. the significance and interrelationships between biotic elements, abiotic elements and energy within an ecosystem
2. the distribution and types of habitats and their key characteristics
3. how animal and plant communities develop, how they interact and the factors affecting them
4. biodiversity in natural and human-influenced ecosystems
5. the effects of natural and managed activity on soil, water and the environment.

Learners must be able to:

1. use ecological terminology appropriately
2. identify, measure and evaluate the animal and plant community development in complex natural and/or managed UK habitats
3. measure and test a range of related environmental factors
4. identify important ecological characteristics in plants and/or animals.

In order to engage with this topic effectively, learners must use the following PLTS:

- independent enquirers
- creative thinkers

- self-managers
- effective participators.

Topic 3.2 The management of natural resources and resources for production (60 GLH)

Purpose

The purpose of this topic is to explore:

- why natural and human-influenced environments need managing
- use of wild and cultivated plant and wild and domesticated animal resources
- practical skills required to manage animal and plant communities in a range of natural and managed communities.

Scope of content

Learners must know and understand:

1. the environmental, economic and social factors that influence the productivity and sustainability of environmental and land-based (including food) production systems
2. the purpose and outcomes of active intervention programmes, including green space and wildlife, leisure and recreation and food production (including fisheries)
3. principles and practices of managing and maintaining the health of plants and the health and welfare of animals for the production of food, fibre, fuel, fodder and other products
4. important factors in animals and plants and how these influence breeding and restocking schemes
5. types of pollutants and their implications for environmental management.

Learners must be able to:

1. use basic models to predict environmental impacts
2. carry out a pollution assessment on a natural or human-influenced habitat
3. carry out and review plant, and/or animal and/or habitat management strategies
4. plan and execute an appropriate active intervention programme.

In order to engage with this topic effectively, learners must use the following PLTS:

- independent enquirers

- reflective learners
- team workers
- self-managers
- creative thinkers.

Topic 3.3 Business and enterprise in the environmental and land-based sector (90 GLH)

Purpose

The purpose of this topic is to explore:

- the range of environmental and land-based industries, their importance to the UK and global economies and the career opportunities they offer
- business principles, structures, practices and drivers in the environmental and land-based sector
- the responsibilities and challenges of the environmental and land-based sector in respect of its stakeholders and customers
- business skills required by environmental and land-based employees.

Scope of content

Learners must know and understand:

1. the breadth of the environmental and land-based sector, its importance to the UK and global economies and how the organisations involved inter-relate
2. best business principles, practice and ethics in the environmental and land-based sector
3. environmental and land-based business structures, organisation, management and leadership to deliver a product or service to stakeholders
4. the influence of stakeholders and customers on business operations, marketing, supply chain management and development
5. the industry response to and public perception of environmental and land-based sector enterprises
6. the need to assess and manage environmental and business risks
7. the importance of ethical and socially responsive customer service and how environment and land-based enterprises ensure customers' needs are met
8. the principles and practices of quality management systems, quality standards, quality assurance schemes and codes of practice in the environmental and land-based sector

9. the professional and personal skills and attributes required by environmental and land-based employers and employees

10. career pathways available in the environmental and land-based sector and the training, further and higher education opportunities available.

Learners must be able to:

1. plan a business strategy with colleagues

2. carry out a business risk analysis

3. design and carry out surveys to explore customer needs

4. analyse data on marketing requirements

5. carry out a self-appraisal and produce a career plan.

In order to engage with this topic effectively, learners must use the following PLTS:

- independent enquirers
- creative thinkers
- reflective learners
- team workers
- self-managers.

Topic 3.4 Applied plant and animal science (60 GLH)

Purpose

The purpose of this topic is to explore:

- the basic structure and functions of plants and animals
- plant and animal physiology – nutrition, reproduction and pathology
- scientific principles to support the management of plant and animal populations
- inter-relationships between plants and animals in the natural and managed environment.

Scope of content

Learners must know and understand:

1. the functions and physiology of plants
2. the functions and biological systems of animals
3. the principles of nutrition, reproduction and pathology for the management of plant and animal populations
4. the inter-relationships between plants and animals: food chains, energy flows and the carbon cycle, and the impact of intervention strategies
5. relevant laboratory and science techniques applied to managing plant and animal populations.

Learners must be able to:

1. use correct terminology and laboratory techniques
2. identify major structures and systems in plants and animals
3. monitor the effects of an abiotic or a biotic factor on plants and animals
4. apply knowledge of nutrition, reproduction and pathology to the management of plant and animal populations
5. conduct investigations to identify inter-relationships between plants and animals in the natural and managed environment.

In order to engage with this topic effectively, learners must use the following PLTS:

- independent enquirers
- reflective learners
- effective participants.

Topic 3.5 Plants, animals and humans (60 GLH)

Purpose

The purpose of this topic is to explore:

- the role and uses of wild and domesticated animals in the human economy and for wellbeing: production, work, companionship, recreation and tourism and wild space
- the role and uses of wild and cultivated plants in the human economy and for wellbeing: production, recreation and tourism and wild space
- waste and pollutants and how they are managed by commercial enterprises
- environmental impact and environmentally sensitive areas.

Scope of content

Learners must know and understand:

1. the significance of wild and cultivated plants and wild and domesticated animals to the economy, the environment and human health and development
2. the cultural, humane, social and ethical implications on the environment of the commercial and recreational use of plants and animals
3. the sustainable development and conservation pressures and opportunities for plants and animals used in production, leisure and medicine
4. relationships and inter-dependencies of plants to plants; plants to animals and animals to animals in commercial development, recreation and conservation
5. up-scaling production and the implications for environmental and commercial systems
6. the impact of pollution and waste from recreational and commercial enterprises and techniques to prevent, monitor and manage these within wider environmental systems.

Learners must be able to:

1. assess the impact on a habitat or ecosystem of a new or up-scaled commercial enterprise
2. carry out a pollution assessment on a commercial enterprise
3. conduct a waste management system analysis.

In order to engage with this topic effectively, learners must use the following PLTS:

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

Topic 3.6 Plants and animals: safe working practices and relevant legislation (60 GLH)

Purpose

The purpose of this topic is to explore:

- health and safety risks, their management and levels of incidence
- systems to support safe working practices across the environmental and land-based sector
- the legal obligations of environmental and land-based enterprises
- how these obligations are implemented.

Scope of content

Learners must know and understand:

1. the roles of relevant statutory and non-statutory agencies and government-appointed organisations and the European Union in respect of safe and legal work
2. how to comply with the legislation for the safe and legal import and export of plants and animals and their primary and secondary products
3. practices used to secure supplies of plants and animals and how plant and animal movements, their products and origins are tracked, traced and regulated
4. the potential for accidents, illnesses, diseases, welfare problems and hazardous situations in the environmental and land-based sector and the levels of incidence
5. the importance of safety audits on different environmental and land-based organisations and how they are implemented
6. the mechanisms designed to prevent wild and domesticated animal diseases and wild and cultivated plant diseases and the management of outbreaks
7. the legal responsibilities for health, welfare and safety and how these responsibilities are put into practice within a workplace.

Learners must be able to:

1. apply techniques to monitor movements of plants and animals

2. analyse tracking data to identify quality issues

3. carry out a safety audit or a risk assessment on an environmental or land-based premise

4. review and revise health and safety policies for a workplace.

In order to engage with this topic effectively, learners must use the following PLTS:

- independent enquirers
- creative thinkers
- reflective learners.

Topic 3.7 Sustainable development of resources (60 GLH)

Purpose

The purpose of this topic is to explore:

- the balance between the environmental and economic viability of sustainable development
- the importance of environmental policy, planning, management and protection and the roles of the organisations involved in sustainable development
- the skills needed to design sustainable environmental solutions.

Scope of content

Learners must know and understand:

1. the scientific principles of sustainability, concept of sustainable development and their ethical, economic, political and environmental implications
2. habitats that fulfill important global, national, local and specific roles and who regulates and manages them
3. the role of governments, organisations and agencies involved in managing, planning, developing and funding the environment, their roles, the standards they work to and how they implement them
4. the influence of the media and pressure groups on sustainability
5. the principles and practices of environmental policy, planning and decision making, the links between them and their contribution to sustainable development
6. why and how the protection of endangered animals and plant species and habitat protection is managed nationally and internationally
7. the purposes of biodiversity conservation and the requirements of good development design; the principles and practices of industrial environmental ecology and management
8. the industrial infrastructure and the underpinning scientific principles required to secure good quality supplies of water and power and to treat waste economically.

Learners must be able to:

1. survey and design a solution for a site or habitat to improve its sustainability

2. use technology to produce a fit-for-purpose design solution

3. engage individuals and communities in habitat improvement initiatives

4. produce and monitor a sustainability management plan for a site following appropriate consultation.

In order to engage with this topic effectively, learners must use the following PLTS:

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

Topic 3.8 Global impacts and the environmental and land-based sector (60 GLH)

Purpose

The purpose of this topic is to explore:

- current issues in the management of environmental resources for a sustainable future
- the impact of changing natural processes on commercial systems in the environmental and land-based sector.

Scope of content

Learners must know and understand:

1. new drivers in environmental management and the effects on individuals and businesses on a local, national and global scale
2. how issues arising from human pressures on the environment (such as the need for energy, recreational use, recreational ecology and tourism) are managed
3. possible impact of natural and human-induced climatic change on ecosystems at a local, national and global scale and how environmental and land-based practices may impact on local and global climatic change
4. the concept of and science underpinning carbon neutrality, carbon management and carbon off-setting on a local, national and global scale
5. the social, economic, cultural, political and environmental implications of poor management of finite resources
6. the use of renewable resources to produce energy in the future
7. innovation in pollution management and control, waste management and recycling
8. the outcomes of global environmental impacts on a local scale.

Learners must be able to:

1. develop a strategy and action plan for a carbon-neutral future for a business and/or self
2. identify and evaluate the response of a business to a global environmental issue.

In order to engage with this topic effectively, learners must use the following PLTS:

- independent enquirers
- creative thinkers
- reflective learners
- self-managers.

Topic 3.9 Research methods, skills and environmental analysis (60 GLH)

Purpose

The purpose of this topic is to explore:

- the value of environmental evaluation
- the techniques, skills and resources required to undertake valid research
- the use and execution of environmental impact assessments.

Scope of content

Learners must know and understand:

1. the value, purpose and consequences of environmental analysis
2. the principles of and techniques used in scientific methods of research, including the importance of a sound evidence base
3. the purpose of risk assessments to research procedures and propose solutions
4. the range of resources required for research projects and how to assess their validity
5. the choice of recording systems available to the researcher and the techniques used to secure appropriate solutions to environmental problems
6. the contribution of formal decision-making techniques
7. the social and economic tools that can be used to support the development of environmental objectives
8. why and how researchers' prejudices can affect findings and recommendations.

Learners must be able to:

1. adopt sound scientific principles to carry out an environmental analysis of a habitat
2. use statistical and error analysis tools correctly
3. analyse data including inferential techniques
4. use a range of impact assessment techniques

5. accurately collect, record, collate, synthesise and formally report on results.

In order to engage with this topic effectively, learners must use the following PLTS:

- independent enquirers
- creative thinkers
- reflective learners
- self-managers
- effective participators.

Personal, learning and thinking skills

Awarding bodies must design learning outcomes and assessment criteria that clearly include opportunities for the development of personal, learning and thinking skills. At all levels of the Diploma, principal learning must include all six PLTS. These should be integrated as a minimum within the assessment criteria for principal learning to explicitly recognise the application of these skills within sector-relevant contexts.

Awarding bodies must also provide a clear mapping of the coverage of personal, learning and thinking skills within their submission. This should be at the level requested under each topic within the criteria, such as ‘independent enquirers’, ‘creative thinkers’ and so on.

Functional skills

Components and qualifications based on these criteria must provide opportunities for learners to develop and apply functional skills within sector-specific contexts. Awarding bodies must provide a summary of appropriate opportunities identified.

Additional and specialist learning

Please refer to the *Criteria for accreditation of Diploma qualifications at levels 1, 2 and 3* (QCA/07/3112) for the rules governing additional and specialist learning.

The DDP has created and published *Specialist Learning for the Diploma in environmental and land-based studies*, which outlines the sector requirements for specialist learning. Awarding Bodies should use the document as a basis for dialogue with the DDP about the identification and development of specialist learning. Please use the web address below to access this document:

www.diplomalbe.co.uk

Level 3 external assessment

At level 3, the principal learning will have 120 GLH of external assessment.

