



National 5
Course Assessment
Specification



National 5 Environmental Science Course Assessment Specification

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Please refer to the note of changes at the end of this *Course Assessment Specification* for details of changes from previous version (where applicable).

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Course outline

Course title:	National 5 Environmental Science
SCQF level:	5 (24 SCQF credit points)
Course code:	to be advised
Course assessment code:	to be advised

The purpose of the Course Assessment Specification is to ensure consistent and transparent assessment year on year. It describes the structure of the Course assessment and the mandatory skills, knowledge and understanding that will be assessed.

Course assessment structure

Component 1 — question paper	80 marks
Component 2 — assignment	20 marks
Total marks	100 marks

This Course includes six SCQF credit points to allow additional time for preparation for Course assessment. The Course assessment covers the added value of the Course.

Equality and inclusion

This Course Assessment Specification has been designed to ensure that there are no unnecessary barriers to assessment. Assessments have been designed to promote equal opportunities while maintaining the integrity of the qualification.

For guidance on assessment arrangements for disabled learners and/or those with additional support needs, please follow the link to the Assessment Arrangements web page: www.sqa.org.uk/sqa/14977.html.

Guidance on inclusive approaches to delivery and assessment of this Course is provided in the *Course Support Notes*.

Assessment

To gain the award of the Course, the learner must pass all of the Units as well as the Course assessment. Course assessment will provide the basis for grading attainment in the Course award.

Course assessment

SQA will produce and give instructions for the production and conduct of Course assessments based on the information provided in this document.

Added value

The purpose of the Course assessment is to assess added value of the Course as well as confirming attainment in the Course and providing a grade. The added value for the Course will address the key purposes and aims of the Course, as defined in the Course Rationale. It will do this by addressing one or more of breadth, challenge, or application.

In this Course assessment, added value will focus on the following:

- ◆ breadth — drawing on knowledge and skills from across the Course
- ◆ challenge — requiring greater depth or extension of knowledge and/or skills
- ◆ application — requiring application of knowledge and/or skills in practical or theoretical contexts as appropriate

This added value consists of:

- ◆ a question paper, which requires learners to demonstrate aspects of breadth, challenge and application; learners will apply breadth and depth of skills, knowledge and understanding from across the Course to answer questions in environmental science
- ◆ an assignment, which requires learners to demonstrate aspects of challenge and application; learners will apply skills of scientific inquiry, using related knowledge, to carry out a meaningful and appropriately challenging task in environmental science and communicate their findings

Grading

Course assessment will provide the basis for grading attainment in the Course award.

The Course assessment is graded A–D. The grade is determined on the basis of the total mark for all Course assessments together.

A learner's overall grade will be determined by their performance across the Course assessment.

Grade description for C

For the award of Grade C, learners will have demonstrated successful performance in all of the Units of the Course. In the Course assessment, learners will typically have

demonstrated successful performance in relation to the mandatory skills, knowledge and understanding for the Course.

Grade description for A

For the award of Grade A, learners will have demonstrated successful performance in all of the Units of the Course. In the Course assessment, learners will typically have demonstrated a consistently high level of performance in relation to the mandatory skills, knowledge and understanding for the Course.

In addition, learners achieving a Grade A will have demonstrated a high overall level of performance by:

- ◆ retaining knowledge and understanding over a long period of time
- ◆ showing a deeper level of knowledge and understanding
- ◆ integrating and applying skills, knowledge and understanding across the three component Units of the Course
- ◆ displaying problem solving skills in less familiar and more complex contexts
- ◆ applying skills of scientific inquiry and analytical thinking in complex contexts that involve more complex data

Credit

To take account of the extended range of learning and teaching approaches, remediation, consolidation of learning and integration needed for preparation for external assessment, six SCQF credit points are available in Courses at National 5 and Higher, and eight SCQF credit points in Courses at Advanced Higher. These points will be awarded when a grade D or better is achieved.

Structure and coverage of the Course assessment

The Course assessment will consist of two Components: a question paper, and an assignment. The question paper will have one Section. The assignment will have one Section.

Component 1 — question paper

The purpose of the question paper is to assess breadth and depth of knowledge and understanding from across the Units.

The question paper will give learners an opportunity to demonstrate the following skills, knowledge and understanding by:

- ◆ recalling knowledge
- ◆ integrating and applying environmental science knowledge and understanding
- ◆ applying scientific inquiry skills
- ◆ applying scientific analytical thinking skills
- ◆ solving problems
- ◆ explaining the impact of applications to society/the environment

The mandatory skills and knowledge are specified in the 'Further mandatory information on Course coverage' section at the end of this Course Assessment Specification.

The question paper will have 80 marks (80% of the total mark).

The question paper will have one Section, which contains restricted and extended response questions.

Marks will be distributed approximately proportionately across the Units. The majority of the marks will be awarded for applying knowledge and understanding. The other marks will be awarded for applying scientific inquiry, scientific analytical thinking and problem solving skills.

Component 2 — assignment

The purpose of the assignment is to allow the learner to carry out an in-depth study of an environmental science topic. The topic will be chosen by the learner, who will investigate/research the underlying environmental science and the impact on society/the environment.

The assignment will assess the application of skills of scientific inquiry and related environmental science knowledge and understanding.

The assignment will have 20 marks (20% of the total marks).

The majority of the marks will be awarded for applying scientific inquiry and analytical thinking skills. The other marks will be awarded for applying related knowledge and understanding.

In preparation for the controlled assessment, the learner will:

- ◆ select an appropriate environmental science topic, within the set guidelines provided by SQA

- ◆ investigate/research the topic, focusing on applications and impact on society/the environment
- ◆ process the information/data collected

In the controlled assessment, the learner will present evidence of:

- ◆ the process they have undertaken
- ◆ environmental science knowledge and understanding related to the topic investigated/researched
- ◆ the application of the topic
- ◆ a balanced evaluation of the impact on society/the environment
- ◆ a reasoned conclusion

Setting, conducting and marking of assessment

Question paper

This question paper will be set and marked by SQA, and conducted in centres under conditions specified for external examinations by SQA. Learners will complete this in 2 hours.

Controlled assessment — assignment

This assignment is:

- ◆ set by centres within SQA guidelines
- ◆ conducted under a high degree of supervision and control

Evidence will be submitted to SQA for external marking.

All marking will be quality assured by SQA.

Setting the assessment

Set by centres within SQA guidelines.

Conducting the assessment

Conducted under a high degree of supervision and control.

Learners will complete the controlled assessment in no more than 1 hour and under open-book supervised conditions.

SQA will provide an assignment specification for the generation of evidence. Learners will have a choice of topic to be investigated/researched. SQA will specify the extent of the material to be taken into the controlled assessment.

The production of evidence for the assessment will be carried out:

- ◆ with the use of specified resources
- ◆ in time to meet a submission date set by SQA
- ◆ independently by the learner

Further mandatory information on Course coverage

The following gives details of mandatory skills, knowledge and understanding for the National 5 Environmental Science Course. Course assessment will involve sampling the skills, knowledge and understanding. This list of skills, knowledge and understanding also provides the basis for the assessment of Units of the Course.

The following gives details of the skills:

- ◆ demonstrating knowledge and understanding of environmental science by making statements, describing information, providing explanations and integrating knowledge
- ◆ applying environmental science knowledge to new situations, interpreting information and solving problems
- ◆ planning, designing, and safely carrying out investigations/experiments to test given hypotheses or to illustrate particular effects
- ◆ selecting information from a variety of sources
- ◆ presenting information appropriately in a variety of forms
- ◆ processing information (using calculations and units, where appropriate)
- ◆ making predictions and generalisations based on evidence/information
- ◆ drawing valid conclusions and giving explanations supported by evidence/justification
- ◆ suggesting improvements to investigations/experiments
- ◆ communicating findings/information

These skills will be assessed, across the Course, in the context of the mandatory knowledge.

The following table specifies the mandatory knowledge for the National 5 Environmental Science Course.

Living Environment	
1	Investigating ecosystems and biodiversity
a.	Ecological terms to include habitat community, biotic, abiotic, biodiversity, species, population, adaptation and competition
b.	Biodiversity in the context of one aquatic and one terrestrial ecosystem of national importance
c.	Sampling plants and animals using quantitative techniques including quadrats and pitfall traps
d.	Evaluation of their limitations and sources of error
e.	Measuring abiotic factors including light intensity, temperature, pH and soil moisture
f.	Using data to assess the effect of abiotic factors on the distribution of organisms
g.	Using and constructing paired-statement keys to identify organisms

2 Interdependence

- a. Food webs. Terms to include carnivore, herbivore, omnivore, producer, primary/secondary/tertiary consumer, detritivore, decomposer and niche
- b. Factors affecting food webs including predation, disease, competition, natural and human impacts
- c. Energy flow through food webs and energy loss through movement, heat and undigested material
- d. Simple word equations of photosynthesis and respiration and the interdependence between plants and animals
- e. The processes involved in the nitrogen cycle to include nitrogen fixation, death/decay, nitrification and denitrification by bacteria, absorption by plants, feeding by animals
- f. The processes involved in the carbon cycle to include photosynthesis, respiration, feeding, decomposition, formation and combustion of fossil fuels

3 Human influences on biodiversity

- a. Human activities which can affect ecosystems positively or negatively. Species reduction or increase, extinction and loss of biodiversity
- b. Indicator species in environmental monitoring
- c. The impact of non-native species on ecosystems
- d. Conflicts between land and/or water based activities and an environment of national importance
- e. Relevant current national organisations, policies and legislation for the protection of the environment

Earth's Resources

1 Overview of Earth systems and their interactions

- a. Earth systems — geosphere, hydrosphere, atmosphere and biosphere
- b. The rock, carbon, nitrogen and water cycles connect the systems
- c. Resources to include physical, biological, renewable and non-renewable

2 Geosphere

- a. Structure of the Earth: core, mantle and crust
- b. Difference between minerals and rocks
- c. Properties of rocks including porosity and permeability
- d. The rock cycle and formation of igneous, sedimentary and metamorphic rocks
- e. Limestone: formation, discovery, extraction, processing, uses
- f. Difference between ore minerals and ores
- g. Iron ore: formation, discovery, extraction, processing and uses of iron
- h. Petroleum: formation, discovery, extraction, processing and uses
- i. The carbon cycle to include limestone and fossil fuels

<p>3 Hydrosphere</p> <ul style="list-style-type: none"> a. The main reservoirs of water to include atmosphere, oceans, ice, freshwater and groundwater b. The water cycle including evaporation, transpiration, condensation and precipitation c. Uses of water: industrial, domestic and agricultural d. Issues arising from national availability of water resources in the UK e. Energy from water including hydroelectric and tidal power f. Requirements for siting hydroelectric and tidal power stations
<p>4 Biosphere</p> <ul style="list-style-type: none"> a. Oceanic and freshwater resources including economically important species b. Terrestrial resources including economically important species c. Energy from biological resources
<p>5 Atmosphere</p> <ul style="list-style-type: none"> a. Uses of nitrogen and oxygen b. Energy from wind power c. Requirements for siting wind farms

<p>Sustainability</p>
<p>1 Introduction to sustainability</p> <ul style="list-style-type: none"> a. Introduction to sustainability and sustainable development b. Global citizenship
<p>2 Food</p> <ul style="list-style-type: none"> a. Global population increase and the pressure on food supplies b. Strategies for a secure food supply, in farming, to include intensive farming, GM crops and agrochemicals c. Organic farming advantages and disadvantages d. Strategies for a secure food supply, in freshwater and marine based systems, to include intensive fishing and alternative species e. Fish conservation to include marine conservation areas, zoning, sustainable fishing methods f. The environmental impact of food distribution – ‘food miles’ g. National policies and legislation relating to food production
<p>3 Water</p> <ul style="list-style-type: none"> a. Increased water demand due to increase in global population b. Clean water supplies in developed and developing countries c. Issues arising from water use including international conflicts in river basins, contamination of water supplies, impact on public health, effluents, thermal pollution, tourism and recreation d. Sustainable approaches to water use including methods of water conservation e. National policies, legislation and statutory bodies relating to water use

4 Energy

- a. Increased energy demand due to increase in global population
- b. Renewable and non-renewable energy sources and issues arising from their use
- c. Enhanced greenhouse effect to include carbon dioxide and methane and their sources
- d. Sustainable approaches to reduce greenhouse gas emissions
- e. Social, economic and environmental impacts of climate change, including habitat loss, reduction in biodiversity, changes in species distribution
- f. National policies and legislation relating to energy use

5 Waste management

- a. Increased waste production due to society's demands
- b. Sustainable approaches in waste management, to include: reduce, reuse and recycle
- c. Education and personal responsibility
- d. National policies and legislation relating to waste management

Administrative information

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Superclass: to be advised

History of changes to Course Assessment Specification

Course details	Version	Description of change	Authorised by	Date