National 4 Course Specification

National 4 Environmental Science Course Specification (C726 74)

Valid from August 2013

First edition: April 2012
Revised: September 2014, version 1.2

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

Course outline

Course title: National 4 Environmental Science

SCQF: level 4 (24 SCQF credit points)

Course code: C726 74

Mandatory Units

The Course has four mandatory Units including the Added Value Unit:

H24P 74	**Environmental Science: Living Environment (National 4)**	**6 SCQF credit points**
And either:		
H24S 74	**Environmental Science: Sustainability (National 4)**	**6 SCQF credit points**
Or		
H6N8 74	**Environmental Science: Sustainability with a Scottish Context (National 4)***	**6 SCQF credit points**
And either:		
H24R 74	**Environmental Science: Earth's Resources (National 4)**	**6 SCQF credit points**
Or		
H6N7 74	**Environmental Science: Earth's Resources with a Scottish Context (National 4)***	**6 SCQF credit points**

and
Added Value Unit:

H24T 74	**Environmental Science Assignment (National 4)**	**6 SCQF credit points**

This Course includes six SCQF credit points for the assessment of added value in the Added Value Unit. Further information on this Unit is provided in the Assessment section.

*Scottish Studies Award contributing Unit: This Course Specification should be read in conjunction with the relevant Scottish Studies Unit Specification on the Scottish Studies Award web page

Recommended entry

Entry to this Course is at the discretion of the centre. However, learners would normally be expected to have attained the skills and knowledge required by one or more of the following or by equivalent qualifications and/or experience:

- National 3 Environmental Science Course or relevant component Units
- National 3 Geography Course or relevant component Units

There may also be progression from National 3 Biology, National 3 Chemistry, National 3 Physics, or National 3 Science Courses.

In terms of prior learning and experience, relevant experiences and outcomes may also provide an appropriate basis for doing this Course. Further information on relevant experiences and outcomes is given in the *Course Support Notes*.

Progression

This Course or its Units may provide progression to:

- other qualifications in Environmental Science or related areas
- further study, employment or training

Further details are provided in the Rationale section.

Equality and inclusion

This Course Specification has been designed to ensure that there are no unnecessary barriers to learning or assessment. The individual needs of learners should be taken into account when planning learning experiences, selecting assessment methods or considering alternative evidence. For further information, please refer to the *Course Support Notes*

Rationale

All new and revised National Courses reflect Curriculum for Excellence values, purposes and principles. They offer flexibility, provide more time for learning, more focus on skills and applying learning, and scope for personalisation and choice.

In this Course, and its component Units, there will be an emphasis on skills development and the application of those skills. Assessment approaches will be proportionate, fit for purpose and will promote best practice, enabling learners to achieve the highest standards they can.

This Course provides learners with opportunities to continue to acquire and develop the attributes and capabilities of the four capacities as well as skills for learning, skills for life and skills for work.

All Courses provide opportunities for learners to develop breadth, challenge and application, but the focus and balance of the assessment will be appropriate for the subject area.

Relationship between the Course and Curriculum for Excellence values, purposes and principles

The National 4 Environmental Science Course encourages the development of skills and resourcefulness, which lead to becoming a confident individual. Successful learners in environmental science think creatively, analyse and solve problems. Environmental science aims to produce responsible citizens, through studying relevant areas such as the living environment, the Earth's resources and sustainability. Learners will be able to develop their communication and collaborative working skills.

Environmental science is an inter-disciplinary subject, which draws from the sciences and social sciences. The Course is practical and experiential and develops scientific awareness of environmental issues. Environmental scientists are involved in tackling issues such as global climate change, pollution, use of land and water resources and changes in wildlife habitats.

The Course allows learners to understand and investigate the world in an engaging and enjoyable way. It develops learners' ability to think analytically, creatively and independently, and to make reasoned evaluations. The Course provides opportunities for learners to acquire and apply knowledge, to evaluate environmental and scientific issues, to consider risk, and to make informed decisions. This can lead to learners developing an informed and ethical view of topical issues. Learners will develop skills in communication, collaborative working and leadership, and apply critical thinking in new and unfamiliar contexts to solve problems.

Purpose and aims of the Course

The purpose of the Course is to develop learners' interest and enthusiasm for environmental science in a range of contexts, as well as their investigative and experimental skills. Environmental science takes a problem solving approach to attempt to develop solutions that prevent or reverse environmental deterioration and aim for sustainable practices.

The Course aims to develop an understanding of environmental issues. It provides a range of up-to-date topics relevant to the role of environmental science in society.

Through the Course, learners will investigate key areas of the living environment, the Earth and its resources. It allows learners the opportunity to investigate sustainability and sustainable development. The Course has a strong interdisciplinary nature and aims to develop skills, knowledge and understanding in relevant areas of science and social science. It provides opportunities for learners to develop their scientific literacy skills. In addition, learners will consider the impact that environmental science makes on their lives, on the lives of others, on the environment, and on society. Skills will be developed in each of the Units in the context of discrete areas of content.

The Course allows flexibility and personalisation within each Unit and within the Added Value Unit of the Course by offering choice in the contexts studied.

The Course aims for learners to:

- develop and apply knowledge and understanding of environmental science
- develop an understanding of environmental science's role in scientific issues and relevant applications of environmental science in society and the environment
- develop scientific inquiry and investigative skills
- develop scientific analytical thinking skills in an environmental science context
- develop the use of technology, equipment and materials, safely, in practical scientific activities
- develop problem solving skills in an environmental science context
- develop practical fieldwork skills in an environmental science context
- use and understand scientific literacy, in everyday contexts, to communicate ideas and issues
- develop the knowledge and skills for more advanced learning in environmental science

Information about typical learners who might do the Course

The Course is suitable for learners who have experienced learning across the sciences and/or people, place and environment experiences and outcomes.
The Course may be suitable for those wishing to study environmental science for the first time.

This Course has a skills-based approach to learning. It takes account of the needs of all learners and provides sufficient flexibility to enable learners to achieve in different ways.

Environmental Science Courses are offered from SCQF level 3 to SCQF level 6. Vertical progression is possible through these levels, while lateral progression is possible to other qualifications in the sciences. This Course can also assist entry to employment, training and further education.

Course structure and conditions of award

Course structure

The Course develops skills in an environmental science context. Learners will gain an understanding of environmental science, and develop this through a variety of approaches, including practical activities.

The Course has four mandatory Units including the Added Value Unit. The first three Units listed below are designed to provide progression to the corresponding Units at National 5.

Units are statements of standards for assessment and not programmes of learning and teaching. They can be delivered in a number of ways.

Units can be taught sequentially or in parallel to each other. However, learning and teaching approaches should provide opportunities to integrate skills, where possible.

Environmental Science: Living Environment (National 4)
In this Unit, learners will develop skills of scientific inquiry, investigation and analytical thinking, along with knowledge and understanding in the context of the living environment. Learners will research issues and communicate information related to their findings, which will develop skills of scientific literacy. The key areas covered are: interdependence; adaptation for survival; the impact of population growth and natural hazards on biodiversity; and the nitrogen cycle and the environmental impact of fertilisers.

Environmental Science: Earth's Resources (National 4)
In this Unit, learners will develop skills of scientific inquiry, investigation and analytical thinking, along with knowledge and understanding in the context of the Earth's resources. Learners will research issues and communicate information related to their findings, which will develop skills of scientific literacy. The key areas covered are: the responsible use and conservation of non-renewable and renewable resources; the formation and use of fossil fuels; the derivation and uses of materials derived from crude oil; the risks and benefits of different energy sources, including those produced from plants; the carbon cycle and processes involved in maintaining the balance of gases in the air, and the causes and implications of changes in the balance.

Environmental Science: Sustainability (National 4)
In this Unit, learners will develop skills of scientific inquiry, investigation and analytical thinking, along with knowledge and understanding in the context of sustainability. Learners will research issues and communicate information related to their findings, which will develop skills of scientific literacy. The key areas covered are: the sustainability of key natural resources and possible implications for human activity; the interaction between humans and the environment and the impact of human activity on an area; the role of agriculture in the production of food and raw material and its environmental impacts and sustainability; society's energy needs and the impact of developments in transport infrastructure in a selected area; and development of sustainable systems.

Added Value Unit: Environmental Science Assignment (National 4)
In this Unit, learners will draw on and extend the skills they have learned from across the other Units and demonstrate the breadth of knowledge and skills acquired, in unfamiliar contexts and/or integrated ways.

Conditions of award

To achieve the National 4 Environmental Science Course, learners must pass all of the required Units, including the Added Value Unit. The required Units are shown in the Course outline section.

National 4 Courses are not graded.

Skills, knowledge and understanding

Full skills, knowledge and understanding for the Course are given in the *Added Value Unit Specification*. A broad overview of the mandatory subject skills, knowledge and understanding that will be assessed in the Course is given in this section. These include:

- demonstrating knowledge and understanding of environmental science by making statements, describing information and providing explanations
- applying environmental science knowledge to familiar situations, interpreting information and solving problems
- planning and safely carrying out practical investigations/experiments to illustrate effects
- using information handling skills by selecting, presenting and processing information
- evaluating information to solve problems and make decisions
- making generalisations based on evidence/information
- drawing valid conclusions and giving explanations supported by evidence
- suggesting improvements to practical investigations/ experiments
- communicating findings/information

Skills, knowledge and understanding to be included in the Course will be appropriate to the SCQF level of the Course. The SCQF level descriptors give further information on characteristics and expected performance at each SCQF level (www.sqa.org.uk/scqf).

Assessment

Further information about assessment for the Course is included in the *Course Support Notes* and the *Added Value Unit Specification*.

Unit assessment

All Units are internally assessed against the requirements shown in the *Unit Specification.*

They can be assessed on an individual Unit basis or by using other approaches which combine the assessment for more than one Unit.

They will be assessed on a pass/fail basis within centres. SQA will provide rigorous external quality assurance, including external verification, to ensure assessment judgments are consistent and meet national standards.

The assessment of the Units in this Course will be as follows.

Environmental Science: Living Environment (National 4)
Learners who complete the Unit will be able to:

- apply skills of scientific inquiry and draw on knowledge and understanding of the key areas of this Unit to carry out an experiment or practical investigation
- draw on knowledge and understanding of the key areas of this Unit and apply scientific skills

Environmental Science: Sustainability (National 4)
Learners who complete the Unit will be able to:

- apply skills of scientific inquiry and draw on knowledge and understanding of the key areas of this Unit to carry out an experiment or practical investigation
- draw on knowledge and understanding of the key areas of this Unit and apply scientific skills

Environmental Science: Earth's Resources (National 4)
Learners who complete the Unit will be able to:

- apply skills of scientific inquiry and draw on knowledge and understanding of the key areas of this Unit to carry out an experiment or practical investigation
- draw on knowledge and understanding of the key areas of this Unit and apply scientific skills

Added Value Unit

Courses from National 4 to Advanced Higher include assessment of added value[1]. At National 4, added value will be assessed in an Added Value Unit. The Added Value Unit 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.

[1] Definitions can be found here: http://www.sqa.org.uk/sqa/58409.html

In the National 4 Environmental Science Course, the Added Value Unit will focus on challenge and application.

Learners will draw on and apply the skills and knowledge they have learned during the Course. They will carry out an in-depth investigation on an unfamiliar and/or integrated context. This will be assessed through an assignment.

Development of skills for learning, skills for life and skills for work

It is expected that learners will develop broad, generic skills through this Unit. The skills that learners will be expected to improve on and develop through the Unit are based on SQA's *Skills Framework: Skills for Learning, Skills for Life and Skills for Work* and drawn from the main skills areas listed below. These must be built into the Unit where there are appropriate opportunities.

2 Numeracy
2.1 Number processes
2.2 Money, time and measurement
2.3 Information handling

4 Employability, enterprise and citizenship
4.6 Citizenship

5 Thinking skills
5.3 Applying
5.4 Analysing and evaluating

Amplification of these skills is given in SQA's *Skills Framework: Skills for Learning, Skills for Life and Skills for Work*. The level of these skills will be appropriate to the level of the Course. Further information on building in skills for learning, skills for life and skills for work for the Course is given in the *Course Support Notes*.

Administrative information

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History of changes to National Course Specification

Course details	Version	Description of change	Authorised by	Date
	1.1	Skills, knowledge and understanding section: amendment to wording to clarify activities	Qualification Development Manager	June 2013
	1.2	Scottish Studies Award Unit contributing information added. No other changes made to document content.	Qualifications Manager	September 2014