National 4 Course Specification

National 4 Science Course Specification (C765 74)

Valid from August 2013

First edition: April 2012
Revised: June 2013, version 1.1

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 Science

SCQF: level 4 (24 SCQF credit points)

Course code: C765 74

Mandatory Units

H267 74	**Science: Fragile Earth (National 4)**	**6 SCQF credit points**
H268 74	**Science: Human Health (National 4)**	**6 SCQF credit points**
H269 74	**Applications of Science (National 4)**	**6 SCQF credit points**

Added Value Unit

H26A 74	**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.

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 Science Course or relevant component Units

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

Science is vital to everyday life and allows us to understand and shape the world in which we live and influence its future. Scientists play a key role in meeting society's needs in areas such as medicine, energy, industry, material development, the environment and sustainability. As the importance and application of science continues to grow and develop, it is important that everyone has an informed view of science.

An experimental and investigative approach is used to develop knowledge and understanding of science key areas.

The Course provides opportunities for learners to recognise the impact science makes on developing sustainability, and its effects on the environment, on society and on the lives of themselves and others.

The Science Course should encourage resilience, which leads to becoming a confident individual. Successful learners in science think creatively, and analyse and solve problems. Science can produce responsible citizens through studying areas such as health, environment and sustainability.

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' curiosity, interest and enthusiasm for science in a range of contexts. The skills of scientific inquiry and investigation are integrated and developed throughout the Course. The relevance of science is highlighted by the study of the applications of science in everyday contexts.

The Course is an up-to-date selection of ideas relevant to the central position of science within our society. It is practical and experiential, and develops scientific awareness of issues relating to science.

The Course gives opportunities for learners to develop the ability to think analytically, creatively and independently, and to make evaluations. The Course covers a variety of contexts relevant to science's impact on the environment and society through covering the topics Fragile Earth, Human Health and Applications of Science. This will enable learners to become scientifically literate citizens, able to review the science-based claims they will meet. It provides a skills set for progressing to all of the science Courses at National 5.

The aims of this Course are for learners to:

- develop and apply knowledge and understanding of science
- develop an understanding of science's role in scientific issues and relevant applications of science in society and the environment
- develop scientific inquiry and investigative skills
- develop scientific analytical thinking skills in a science context
- develop the use of technology, equipment and materials safely in practical scientific activities
- develop problem solving skills in a 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 sciences

The Course also serves to equip all learners with an understanding of the impact of science on everyday life, and with the knowledge and skills to be able to evaluate media reports. This will also equip learners to make their own decisions on issues within a modern society where the body of scientific knowledge and its applications and implications are ever developing. By using the skills base and knowledge and understanding of science, learners will become scientifically literate citizens.

Information about typical learners who might do the Course

The Course is suitable for learners who have experienced learning across the sciences experiences and outcomes. The Course may be suitable for those wishing to study 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.

Science Courses are offered from SCQF level 3 to SCQF level 4. 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 a science context. Learners will gain an understanding of science, and develop this through a variety of approaches, including practical activities.

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

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.

Science: Fragile Earth (National 4)
In this Unit there are opportunities for personalisation and choice. Learners will focus on two choices from the following four:

- energy
- metals
- water
- food

They will investigate these resources through activities related to their source, origin, production and/or extraction. Uses and benefits will be explored. Conflicts and also possible local, national, or global solutions will be identified. Learners will gain knowledge of how science is involved in environmental issues.

Science: Human Health (National 4)
In this Unit, learners develop an understanding of factors which contribute to a healthy lifestyle, through a personal, community-based and global approach. Learners cover procedures to measure physical fitness, investigate mental/social health issues and research media reports of national/international health areas.

Applications of Science (National 4)
In this Unit, learners explore science's contribution to communication technologies and the impact that these have had on the environment/society. Learners research the production and use of new materials. They cover how science helps the understanding of risk and how it can be reduced in modern life.

Added Value Unit: 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 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. This includes:

- demonstrating knowledge and understanding of science by making statements, describing information, providing explanations
- applying knowledge of science to familiar situations, interpreting information and solving problems
- planning and safely carrying out experiments/investigations to illustrate effects
- using information handling skills by selecting, presenting and processing information
- making generalisations based on evidence/information
- drawing valid conclusions and giving explanations supported by evidence
- suggesting improvements to experiments/investigations
- 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 judgements are consistent and meet national standards.

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

Science: Fragile Earth (National 4)
Learners who complete this 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/practical investigation
- draw on knowledge and understanding of the key areas of this Unit and apply scientific skills

Science: Human Health (National 4)
Learners who complete this 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/practical investigation
- draw on knowledge and understanding of the key areas of this Unit and apply scientific skills

Applications of Science (National 4)
Learners who complete this 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/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 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[2].

[2] See link above for definition.

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

It is expected that learners will develop broad, generic skills through this Course. The skills that learners will be expected to improve on and develop through the Course 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 Course 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