



National 4  
Course  
Specification



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# National 4 Biology Course Specification

**Valid from August 2013**

This edition: April 2012, version 1.0

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

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# Course outline

**Course title:** National 4 Biology

**SCQF:** level 4 (24 SCQF credit points)

**Course code:** to be advised

## Mandatory Units

<b>Cell Biology (National 4)</b>	<b>6 SCQF credit points</b>
<b>Biology: Multicellular Organisms (National 4)</b>	<b>6 SCQF credit points</b>
<b>Biology: Life on Earth (National 4)</b>	<b>6 SCQF credit points</b>

**Added Value Unit:**

<b>Biology Assignment (National 4)</b>	<b>6 SCQF credit points</b>
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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 4 Biology Course or relevant component Units

There may also be progression from National 3 Chemistry, National 3 Environmental Science, 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 Biology or related areas
- ◆ further study, employment and/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**

Biology affects everyone and aims to find solutions to many of the world's problems. Biology, the study of living organisms, plays a crucial role in our everyday existence, and is an increasingly important subject in the modern world. Advances in technologies have made this varied subject more exciting and relevant than ever.

Biology Courses should encourage development of skills and resourcefulness, which lead to becoming a confident individual. Successful learners in biology think creatively, analyse and solve problems. Biology aims to produce responsible citizens, through studying of relevant areas of biology, 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' interest and enthusiasm for biology in a range of contexts. The skills of scientific inquiry and investigation are developed, throughout the Course, by investigating the applications of biology. This will enable learners to become scientifically literate citizens, able to review the science-based claims which they will meet.

The Course will be of value to those wishing to develop skills, knowledge and understanding of biology. It aims to develop scientific understanding of biological issues, with an emphasis on practical activities. The Course is a broad and up-to-date selection of concepts and ideas relevant to the central position of life science within our society. An experimental and investigative approach is used to develop knowledge and understanding of biology's key areas.

The Course covers major areas of biology ranging from cellular to whole organism and up to ecosystems. The key areas of biodiversity, interdependence, body systems and cells and inheritance are developed through the Course. 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 allows flexibility and personalisation by offering choice in the contexts studied.

The Course aims to:

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

The Course also serves to equip all learners with an understanding of the impact of biology 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 biology, 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 biology 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.

Biology Courses are offered from SCQF level 3 to SCQF level 7. 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 biological context. Learners will gain an understanding of biology, 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.

### Cell Biology (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 cell biology. Learners will research issues and communicate information related to their findings, which will develop skills of scientific literacy. The key areas covered are: cell division and its role in growth and repair, DNA, genes and chromosomes, therapeutic use of cells, properties of enzymes and use in industries, properties of microorganisms and use in industries, photosynthesis — limiting factors, factors affecting respiration, and controversial biological procedures.

### Biology: Multicellular Organisms (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 multicellular organisms. Learners will research issues and communicate information related to their findings, which will develop skills of scientific literacy. The key areas covered are: sexual and asexual reproduction and their importance for survival of species, propagating and growing plants, commercial use of plants, genetic information, growth and development of different organisms, and biological actions in response to internal and external changes to maintain stable body conditions.

### Biology: Life on Earth (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 life on Earth. Learners will research issues and communicate information related to their findings, which will develop skills of scientific literacy. The key areas covered are how animal and plants species depend on each other, impact of population growth and natural hazards on biodiversity, nitrogen cycle, fertiliser design and environmental impact of fertilisers, adaptations for survival, and learned behaviour in response to stimuli linked to species survival.

### **Added Value Unit: Biology 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 Biology 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 will be 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 biology by making statements, describing information and providing explanations
- ◆ applying biology knowledge 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](http://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 a Unit-by-Unit basis or by combined assessment.

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.

### Cell Biology (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/practical investigation
- ♦ draw on knowledge and understanding of the key areas of this Unit and apply scientific skills

### Biology: Multicellular Organisms (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/practical investigation
- ♦ draw on knowledge and understanding of the key areas of this Unit and apply scientific skills

### Biology: Life on Earth (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/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](#)<sup>1</sup>. 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.

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<sup>1</sup> Definitions can be found here: [www.sqa.org.uk/sqa/45528.html](http://www.sqa.org.uk/sqa/45528.html)



In the National 4 Biology 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.

Exemplification of possible assessment approaches for Units is provided in the *National Assessment Resource*.

## **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

### **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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**Published:** April 2012 (version 1.0)

**Superclass:** to be advised

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## History of changes to National Course Specification

Course details	Version	Description of change	Authorised by	Date

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Note: You are advised to check SQA's website ([www.sqa.org.uk](http://www.sqa.org.uk)) to ensure you are using the most up-to-date version of the Course Specification.