



## Cell Biology (National 4) Unit

**SCQF:** level 4 (6 SCQF credit points)

**Unit code:** to be advised

### Unit outline

The general aim of this Unit is to develop skills of scientific inquiry, investigation and analytical thinking, along with knowledge and understanding of cell biology. Learners will apply these skills when considering the applications of cell biology on our lives, as well as the implications on society/the environment. This can be done by using a variety of approaches, including investigation and problem solving.

The Unit covers the key areas of: 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. Learners will research issues, apply scientific skills and communicate information related to their findings, which will develop skills of scientific literacy.

Learners who complete this Unit will be able to:

- 1 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
- 2 Draw on knowledge and understanding of the key areas of this Unit and apply scientific skills

This Unit is a mandatory Unit of the National 4 Biology Course and is also available as a free-standing Unit. The Unit Specification should be read in conjunction with the *Unit Support Notes*, which provide advice and guidance on delivery, assessment approaches and development of skills for learning, skills for life and skills for work. Exemplification of the standards in this Unit is given in the *National Assessment Resource*.

The *Added Value Unit Specification* for the National 4 Biology Course gives further mandatory information on Course coverage for learners taking this Unit as part of the National 4 Biology Course.

## **Recommended entry**

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

- ◆ National 3 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 Unit.

## **Equality and inclusion**

This Unit 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 *Unit Support Notes*.

# Standards

## Outcomes and assessment standards

### Outcome 1

The learner will:

- 1 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 by:**
  - 1.1 Planning an experiment/practical investigation
  - 1.2 Following procedures safely
  - 1.3 Making and recording observations/measurements accurately
  - 1.4 Presenting results in an appropriate format
  - 1.5 Drawing valid conclusions
  - 1.6 Evaluating experimental procedures

### Outcome 2

The learner will:

- 2 Draw on knowledge and understanding of the key areas of this Unit and apply scientific skills by:**
  - 2.1 Making accurate statements
  - 2.2 Describing an application
  - 2.3 Describing a biological issue in terms of the effect on the environment/society
  - 2.4 Solving problems

## Evidence Requirements for the Unit

Assessors should use their professional judgement, subject knowledge and experience, and understanding of their learners, to determine the most appropriate ways to generate evidence and the conditions and contexts in which they are used.

The key areas covered in this Unit are: cell division and its role in growth and repair; DNA, genes and chromosomes; genetic inheritance; the therapeutic use of cells; the properties of enzymes and their use in industries; the properties of microorganisms and their use in industries; the limiting factors of photosynthesis; the commercial uses of cells; factors affecting respiration; and controversial biological procedures.

Evidence can be drawn from a variety of sources and presented in a variety of formats. The table below describes the evidence for the Assessment Standards which require exemplification. Evidence may be presented for individual Outcomes or gathered for the Unit as a whole, through combining assessment holistically in a single activity. If the latter approach is used, it must be clear how the evidence covers each Outcome.

Assessment Standard	Evidence required
Planning an experiment/practical investigation	The plan should include: <ul style="list-style-type: none"> <li>♦ an aim</li> <li>♦ a variable to be kept constant</li> <li>♦ measurements/observations to be made</li> <li>♦ the resources</li> <li>♦ the method, including health and safety considerations</li> </ul>
Making and recording observations/measurements accurately	Units used appropriately
Presenting results in an appropriate format	One format per Unit from: table, graph, chart, key, diagram, flow chart or other appropriate format
Drawing a valid conclusion	Include reference to the aim
Evaluating experimental procedures	Suggest an improvement
Making accurate statements	One for each of the key areas
Describing a biological issue in terms of the effect on the environment/society	The description should include the biology of the issue
Solving problems	One of each per Unit: <ul style="list-style-type: none"> <li>♦ make generalisation/prediction</li> <li>♦ select information</li> <li>♦ process information, including calculations, as appropriate</li> </ul>

Transfer of evidence: Outcome 1 in this Unit may be used as evidence of the achievement of Outcome 1 in the *Multicellular Organisms* and *Life on Earth* Units of this Course.

Exemplification of assessment is provided in the *National Assessment Resource*. Advice and guidance on possible approaches to assessment is provided in the *Unit Support Notes*.

# 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

## 5 Thinking skills

- 5.3 Applying
- 5.4 Analysing and evaluating

Amplification of these is given in SQA's *Skills Framework: Skills for Learning, Skills for Life and Skills for Work*. The level of these skills should be at the same SCQF level of the Unit and be consistent with the SCQF level descriptor. Further information on building in skills for learning, skills for life and skills for work is given in the *Unit 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 Unit Specification

Version	Description of change	Authorised by	Date

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