

Investigative Biology

SCQF: level 7 (8 SCQF credit points)

Unit code: J1XB 77

Unit outline

The general aim of this Unit is to develop the skills, knowledge and understanding to carry out research and practical investigations. This will emphasise the principles and practice of investigative biology and its communication. Learners will do this through investigation of scientific method; scientific literature and communication; scientific ethics; pilot study; variables and minimising their effect; experimental design; controls; sampling; ensuring reliability; evaluating background information, evaluating experimental design; evaluating data analysis and evaluating conclusions.

The collection of experimental data will provide an opportunity to develop planning and organising skills. Learners will research issues and apply scientific skills which will develop their scientific literacy.

This Unit can be integrated across the other Units of the Course. The Unit covers the key areas of: scientific principles and process; experimentation; critical evaluation of biological research.

Learners who complete this Unit will be able to:

- 1 Apply skills of experimentation and draw on knowledge and understanding of scientific principles and process to carry out a biological investigation
- 2 Draw on knowledge and understanding to analyse and evaluate reports of biological research

This Unit 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 *Unit Assessment Support*.

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:

- ◆ Higher Biology or Higher Human Biology Course or relevant Units

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 experimentation and draw on knowledge and understanding of scientific principles and process to carry out a biological investigation by:**
 - 1.1 Designing investigative procedures appropriate to the aim
 - 1.2 Taking account of ethical considerations, as appropriate, in, for example, the use of living materials, human subjects and the conservation of natural habitats
 - 1.3 Identifying potential hazards, assessing associated risks and applying appropriate control measures
 - 1.4 Collecting data with precision and accuracy
 - 1.5 Using initial results to develop or confirm procedures in the experimental design

Outcome 2

The learner will:

- 2 Draw on knowledge and understanding to analyse and evaluate reports of biological research by:**
 - 2.1 Evaluating the scientific method
 - 2.2 Analysing the experimental design
 - 2.3 Evaluating the analysis and presentation of data
 - 2.4 Evaluating conclusions

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.

Evidence can be drawn from a variety of sources and presented in a variety of formats. Evidence may be presented for individual Outcomes or gathered for the Unit as a whole by 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 Thresholds

Outcome 1

Candidates are not required to show full mastery of the assessment standards to achieve outcome 1. Instead, four out of the five assessment standards for outcome 1 must be met to achieve a pass. Candidates must be given the opportunity to meet all assessment standards. The threshold has been put in place to reduce the volume of re-assessment where that is required.

Transfer of evidence

Outcome 1 in this unit of this Course can be used as evidence of the achievement of Outcome 1 in the *Biology: Cells and Proteins (J1X9 77)* and the *Biology: Organisms and Evolution (J1XA 77)* Units of this Course.

Re-assessment

Candidates may be given the opportunity to re-draft their original outcome 1 report or to carry out a new biological investigation.

Outcome 2

There is no requirement to pass assessment standards 2.1, 2.2, 2.3 and 2.4 independently. Candidates can be assessed using a single test that contains marks and a cut-off score.

Where a candidate achieves 50% or more of the total marks available in a single unit assessment, they will pass outcome 2 for this unit. Existing unit assessment support packs can be used. Teachers and lecturers can choose to adapt the existing unit assessment support packs using the following guidance, or can replace the questions with suitable alternatives of a similar standard.

Unit assessment support packs 1 and 2 contain questions covering all of the assessment standards and may be adapted for use as a single assessment. The number of marks available for each question should be combined to give the total number of marks available. A cut-off score of 50% should be applied to the unit assessments.

Centres can continue to assess assessment standards 2.1, 2.2, 2.3 and 2.4 separately using the existing UASPs. If they choose to do this, 50% or more for **each** assessment standard must be correct in the unit assessment to pass outcome 2.

Re-assessment

SQA's guidance on re-assessment is there should only be one or, in exceptional circumstances, two re-assessment opportunities. Re-assessment should be carried out under the same conditions as the original assessment. It is at the teacher or lecturer's discretion how they re-assess their candidates. Candidates may be given a full re-assessment opportunity, or be re-assessed on individual key areas. Candidates must achieve 50% or more of each re-assessment opportunity.

Important note: if centres choose to assess assessment standards 2.1, 2.2, 2.3 and 2.4 separately using the existing unit assessment support packs, candidates must achieve 50% or more for **each** assessment standard (assessment standards 2.1, 2.2, 2.3 and 2.4) in each re-assessment.

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.

1 Literacy

1.1 Reading

1.2 Writing

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

5.5 Creating

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 as 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

Published: July 2019 (version 3.0)

Superclass: RH

History of changes

Version	Description of change	Authorised by	Date
2.0	Outcome numbering changed. Change to Evidence Requirements (Transfer of evidence).	Qualifications Development Manager	April 2015
2.1	Assessment standard threshold information added.	Qualifications Manager	September 2018
3.0	Level changed from Advanced Higher to SCQF level 7 Unit code updated	Qualifications Manager	July 2019

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