



National Unit Specification: general information

UNIT Laboratory Science: Careers using Laboratory Science
(SCQF level 5)

CODE F86K 11

SUMMARY

This Unit has been designed as a mandatory Unit of the Skills for Work Laboratory Science Course at SCQF level 5 and has been designed to be taken as part of that Course. It can also be taken as a freestanding Unit. It is suited to candidates who have an interest in and may be considering a career in laboratory science, as well as those whose interest is more general.

The Unit introduces candidates to the wide range of industries and services which use scientific knowledge and laboratory skills. Candidates will learn about the variety of ways in which science and laboratory skills are used in different industries and services and about the job roles which use these skills. Candidates will investigate a range of career opportunities within industries and services which use laboratory science and investigate the skills, qualifications and experience required for a job role of personal interest within the field of laboratory science.

Candidates will have the opportunity to reflect on and evaluate their own employability skills and attributes.

OUTCOMES

- 1 Investigate the use of laboratory science within different industries and/or services.
- 2 Investigate a range of careers within industries and/or services which use laboratory science.
- 3 Review and evaluate own performance in specified employability skills.

RECOMMENDED ENTRY

Entry is at the discretion of the centre.

CREDIT VALUE

1 credit at SCQF level 5 (6 SCQF credit points at SCQF level 5*).

**SCQF credit points are used to allocate credit to qualifications in the Scottish Credit and Qualifications Framework (SCQF). Each qualification in the Framework is allocated a number of SCQF credit points at an SCQF level. There are 12 SCQF levels, ranging from Access 1 to Doctorates.*

Administrative Information

Superclass: RA

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National Unit Specification: general information (cont)

UNIT Laboratory Science: Careers using Laboratory Science
(SCQF level 5)

CORE SKILLS

There is no automatic certification of Core Skills within this Unit.

Opportunities for developing aspects of Core Skills are highlighted in the *Support Notes* for this Unit Specification.

National Unit Specification: statement of standards

UNIT Laboratory Science: Careers using Laboratory Science (SCQF level 5)

Acceptable performance in this Unit will be the satisfactory achievement of the standards set out in this part of the Unit Specification. All sections of the statement of standards are mandatory and cannot be altered without reference to SQA.

OUTCOME 1

Investigate the use of laboratory science within different industries and/or services.

Performance Criteria

- (a) Identify a range of industries and/or services which use laboratory science.
- (b) Explain why laboratory science is relevant to the identified industries and/or services.
- (c) Explain how laboratory science is used in the identified industries and/or services.
- (d) Organise and present findings in an appropriate format.

OUTCOME 2

Investigate a range of careers within industries and/or services which use laboratory science.

Performance Criteria

- (a) Identify current career opportunities in laboratory science.
- (b) Identify and describe job roles and responsibilities in laboratory science.
- (c) Describe the skills, qualifications and experience required for a job role.
- (d) Organise and present findings in an appropriate format.

OUTCOME 3

Review and evaluate own performance in specified employability skills.

Performance Criteria

- (a) Identify own strengths and weaknesses in specified employability skills
- (b) Seek feedback from others when reviewing own employability skills.
- (c) Identify areas for improvement in specific skills and qualifications and set relevant goals.
- (d) Evaluate progress in achieving these goals over a set period of time.

National Unit Specification: statement of standards (cont)

UNIT Laboratory Science: Careers using Laboratory Science (SCQF level 5)

EVIDENCE REQUIREMENTS FOR THIS UNIT

Written and/or oral evidence which covers all Outcomes and Performance criteria is required for this Unit. All evidence is gathered in open-book conditions.

Outcomes 1 and 2: Written and/or oral evidence

Evidence for Outcomes 1 and 2 will be gathered in open-book conditions at appropriate points throughout the Unit and presented in a candidate folio. Progress will be discussed with the teacher/lecturer at appropriate points during the investigations to ensure that the folio is the candidate's own work. A record of each discussion must be retained.

Candidates will investigate a range of industries and/or services which use laboratory science.

Candidates will be given a clear brief for the investigation.

Candidates are required to:

- ◆ identify **three** industries and/or services which use laboratory science. One must be a local industry and/or service, one must be a national industry and/or service, and one must be a global industry and/or service. The three industries and/or services chosen must include at least **two** from the range:
 - agriculture, horticulture, forestry and fisheries
 - biotechnology/bio-industries
 - chemical industry
 - construction
 - education
 - energy provision
 - engineering
 - food and drink industries
 - health sector
 - pharmaceutical industries
 - sport and recreation
 - transport
- ◆ explain why laboratory science is relevant to each of the identified industries and/or services
- ◆ explain how laboratory science is used within each of the identified industries and/or services
- ◆ identify a current career opportunity in laboratory science in each of the identified industries and/or services
- ◆ describe a job role and responsibilities in laboratory science for each identified industry and/or service
- ◆ describe the skills, qualifications and experience required for **one** identified job role which is of personal interest from **one** of the identified industries and/or services

Candidates must present their findings in an organised and appropriate format.

National Unit Specification: statement of standards (cont)

UNIT Laboratory Science: Careers using Laboratory Science (SCQF level 5)

Outcome 3 Candidate reviews

Evidence requirements for Outcome 3 will take the form of **three** completed candidate reviews which will give candidates the opportunity to record their progress in developing employability skills. Candidates will be provided with a review template.

Each review will include the following:

- ◆ A record of the candidate's analysis of own strengths and weaknesses in relation to the following employability skills:
 - ability to follow instructions
 - awareness of Health and Safety in a laboratory
 - appropriate use of resources
 - positive attitude to learning
 - flexible approach to problem solving
 - confidence to set goals, reflect and learn from experience
 - time management skills
 - communication skills
 - presentation skills
 - numeracy skills
 - practical skills of weighing, measuring, preparing solutions
 - working co-operatively with others
 - confidence to seek feedback
 - review and self-evaluation skills
 - working independently

- ◆ A record of feedback gathered from others in relation to employability skills.

Candidates will gather feedback from the teacher/lecturer on **two** occasions and another person on **one** occasion. The other person can be, for example, another candidate or placement supervisor who has observed the candidate.

- ◆ A record of identified areas for improvement and goals set in relation to these employability skills.

- ◆ An evaluation of progress towards achievement of these goals over a set period of time.

The first review will take place at an early stage of the Unit, one will be completed at an appropriate point during the Unit and the third will be carried out towards the end of the Unit. Candidates will complete the reviews based on their experiences and learning to date. The reviews will be completed in supervised open-book conditions.

On each occasion the candidate must sign and date each review sheet. The review sheets will be countersigned by the assessor.

When delivering this Unit as part of the SCQF level 5 Laboratory Science Course opportunities will occur throughout the Course to identify, develop and practise the relevant skills, which are the basis of the reviews. Further guidance is given in the support notes under content and context.

National Unit Specification: statement of standards (cont)

UNIT Laboratory Science: Careers using Laboratory Science (SCQF level 5)

It is expected that, at this level, most candidates will need support and guidance in completing their reviews. Templates and other support must be provided. However candidates must take responsibility for completing their own reviews.

The National Assessment Bank (NAB) pack provided for this Unit illustrates the standard that should be applied. It contains an investigation template, candidate brief and candidate review sheets. If a centre wishes to design its own assessments for this Unit, they must be of a comparable standard.

National Unit Specification: support notes

UNIT Laboratory Science: Careers using Laboratory Science (SCQF level 5)

This part of the Unit Specification is offered as guidance. The support notes are not mandatory.

While the exact time allocated to this Unit is at the discretion of the centre, the notional design length is 40 hours.

GUIDANCE ON THE CONTENT AND CONTEXT FOR THIS UNIT

This Unit has been designed as a mandatory Unit Skills for Work Laboratory Science Course at SCQF level 5 and has been designed to be taken as part of that Course. It can also be taken as a freestanding Unit. It is suited to candidates who have an interest in, and may be considering a career in laboratory science, as well as those whose interest is more general.

The Unit introduces candidates to the wide range of industries and services which use scientific knowledge and laboratory skills. Candidates will learn about the variety of ways in which science and laboratory skills are used in different industries and services and about the job roles which use these skills. Candidates will investigate a range of career opportunities within industries and services which use laboratory science and investigate the skills, qualifications and experience required for a job role of personal interest within the field of laboratory science.

Candidates will have the opportunity to reflect on and evaluate their own employability skills and attributes.

Outcome 1

Outcome 1 introduces candidates to the wide range of industries and/or services that laboratory science contributes to, including many in which the science element may not be immediately apparent to the client or service user.

Candidates will investigate the role that laboratory science plays in three different industries and/or services. At least two will be chosen from different areas among those specified in the Evidence Requirements. If there is a specific locally-based industry or service which employs staff using laboratory skills or if the candidate has a particular interest in a specific industry or service which does not fall among those listed, then the candidate should be encouraged to include this among their three choices. It is important that candidates learn that there is a wide range of industries and services which make use of science knowledge and skills and that they do so in a variety of different ways.

Candidates are asked to explain both why laboratory science is relevant and how laboratory science is used in each example. For example, in many sport and recreation fields, candidates may comment that laboratory science is relevant because it enables quantifiable checks on athletes' physiological performance during training. Alternatively they may comment that it provides an objective test for the use of banned substances during competition. They would then comment on how it is used in these instances by explaining for example that there would be chemical analysis made of blood and urine samples.

National Unit Specification: support notes

UNIT Laboratory Science: Careers using Laboratory Science (SCQF level 5)

Outcome 2

Candidates will identify career opportunities available using laboratory science and related skills. They should be encouraged to investigate a wide range of such opportunities and to become aware of the use of laboratory work in widely varying industries and services.

Candidates will investigate job roles and responsibilities for each of the three industries and/or services identified in Outcome 1. For some industries and services these may be roles in significantly different areas. For others it is likely that the roles will simply reflect different levels of seniority and, therefore, of experience and responsibility. In this case the employability requirements of checking the precision, accuracy and safety of one's own work and, for more senior staff, taking responsibility for that of others may be discussed.

Candidates will explore and discuss current career opportunities in laboratory science in each of the identified industries and/or services, and will investigate job roles and responsibilities within each industry and/or service. Candidates will investigate the skills, qualifications and experience required for one job role of personal interest from one of the identified industries/services and should be encouraged to explore the variety of possible pathways available for achieving these skills and attributes. There is also the opportunity to consider more generally the range of practical skills needed in laboratory work.

The results of the candidate's investigations for both Outcomes 1 and 2 should be recorded in a suitably organised manner in an appropriate form of folio, eg a presentation, display, poster or set of leaflets. It is important that candidates have the opportunity to develop their skills in organising and presenting their findings clearly, an important skill in science careers.

Outcome 3

This Outcome is intended to give candidates the opportunity to evaluate and to review their performance in employability skills. They will be expected to seek and accept comment from others on those employability skills. They will then be expected to take responsibility for improving their performance by identifying areas for improvement both by self-evaluation and by taking feedback from others. This should include setting goals and evaluation of progress towards these goals over a set period of time. It should also include recording these reviews and progress in a suitable manner.

Employability skills

Candidates will be required to review and evaluate the following employability skills:

- ◆ ability to follow instructions
- ◆ awareness of Health and Safety in a laboratory
- ◆ appropriate use of resources
- ◆ positive attitude to learning
- ◆ flexible approach to problem solving
- ◆ confidence to set goals, reflect and learn from experience
- ◆ time management skills
- ◆ communication skills
- ◆ presentation skills

National Unit Specification: support notes

UNIT Laboratory Science: Careers using Laboratory Science (SCQF level 5)

- ◆ numeracy skills
- ◆ practical skills of weighing, measuring, preparing solutions
- ◆ working co-operatively with others
- ◆ confidence to seek feedback
- ◆ review and self-evaluation skills
- ◆ working independently

These skills can be practised, reviewed and evaluated in real or simulated workplace environments, individual or group laboratory activities. When this Unit is being taken as part of the SCQF level 5 Laboratory Science Course, opportunities will arise to practise, review and evaluate employability skills, for example by carrying out the following activities:

- ◆ Carry out an investigation and contribute to group working in the Unit *Laboratory Science: Practical Investigation Skills* (SCQF level 5)
- ◆ Participate in practical activities in the Units *Laboratory Science: Working in a Laboratory* (SCQF level 5) and *Laboratory Science: Practical Skills* (SCQF level 5)

GUIDANCE ON LEARNING AND TEACHING APPROACHES FOR THIS UNIT

Outcomes 1 and 2

Candidates must identify and describe a number of industries and/or services which use science and laboratory skills and obtain information about some specific job roles within these industries and/or services. This will be in the form of an investigation. The investigation will require candidates to gather information from a variety of sources. These could include:

- ◆ workplace visits
- ◆ work experience
- ◆ visiting speakers
- ◆ interviews with workers in relevant job roles
- ◆ scientific societies
- ◆ internet
- ◆ libraries
- ◆ handouts

It may be beneficial for candidates to work in groups and share information although the final investigation and folio must be the candidate's own work. Candidates should discuss with the group and with the teacher/lecturer a suitable format for presenting the information. Care should be taken that the language and materials used throughout promote equality and diversity and avoid gender or cultural stereotypes. In most cases, styles of presentation will form a natural and appropriate way to allow all candidates to learn of a wider range of industries and services from the work of other candidates in the group.

National Unit Specification: support notes

UNIT Laboratory Science: Careers using Laboratory Science (SCQF level 5)

Outcome 3

Candidates should be encouraged to use the SMART model when setting personal goals, ie they should be specific, measurable, attainable, realistic, time-bound. They should also be encouraged to realise that such targets are personal and so will vary from those of others. Where this Unit is being taken as part of the SCQF level 5 Laboratory Science Course, opportunities to practise employability skills should occur naturally throughout the Course.

OPPORTUNITIES FOR CORE SKILL DEVELOPMENT

In this Unit candidates will be involved in an investigation and in self-evaluation and review of employability skills. They should have the opportunity to practise and develop both oral and written communication skills and their inter-personal skills in working with others as they research the information needed for Outcomes 1 and 2. They will also develop their communication skills in their presentation of their findings for these Outcomes. In Outcome 3 candidates must seek the opinion of others on their performance in specified employability skills which gives further opportunities for them to develop both their communication skills and their ability to work with others. It is likely that most candidates will chose to use computers either as part of their research methods or whilst preparing their presentation or both. Candidates choosing to do this will have the opportunity to develop their ICT skills. Candidates have to take responsibility for their own performance in the investigation and in the review and evaluation of their employability skills. This may allow them to develop the three components of *Problem Solving*: Critical Thinking, Planning and Organising; Reviewing and Evaluating.

GUIDANCE ON APPROACHES TO ASSESSMENT FOR THIS UNIT

If candidates are taking this Unit as a free-standing Unit, centres must ensure that they are given the opportunity to develop the specified employability skills over a period of time in relevant activities.

When this Unit is being delivered as part of the SCQF level 5 Laboratory Science Course, it would be appropriate for Outcomes 1 and 2 to be completed and assessed at the beginning of the course and for Outcome 3 to be assessed throughout the course so that candidates have opportunities to practise and develop the specified employability skills and set and evaluate their goals.

Outcomes 1 and 2

The folio should be the discussed by the candidate and the teacher/lecturer at an appropriate point to authenticate that it is the candidate's own work. A record of this discussion should be kept.

Outcome 3

Feedback from others will be in the form of feedback from a teacher/lecturer on two occasions and feedback from another person on one occasion. The other person could be another candidate, a placement supervisor or anyone else who has observed the candidate and is able to make appropriate comment. The reviews will be completed in supervised open-book conditions. On each occasion the candidate will sign and date each review sheet. The review sheets will be countersigned by the assessor.

National Unit Specification: support notes

UNIT Laboratory Science: Careers using Laboratory Science
(SCQF level 5)

Opportunities for the use of e-assessment

E-assessment may be appropriate for some assessments in this Unit. By e-assessment we mean assessment which is supported by information and communications technology (ICT), such as e-testing or the use of e-portfolios or e-checklists. Centres which wish to use e-assessment must ensure that the national standard is applied to all candidate evidence and that conditions of assessment as specified in the Evidence Requirements are met, regardless of the mode of gathering evidence. Further advice is available in *SQA Guidelines on Online Assessment for Further Education (AA1641, March 2003)*, *SQA Guidelines on e-assessment for Schools (BD2625, June 2005)*.

DISABLED CANDIDATES AND/OR THOSE WITH ADDITIONAL SUPPORT NEEDS

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering whether any reasonable adjustments may be required. Further advice can be found on our website www.sqa.org.uk/assessmentarrangements