

Unit title: Laboratory Science: Careers Using Laboratory Science — Scotland (National 5)

Unit code: H6MX 75

Superclass: RA

Publication date: June 2017

Source: Scottish Qualifications Authority

Version: 1.0

Unit purpose

This unit is an alternative mandatory unit of the National 5 Laboratory Science Skills for Work Course, and is also an optional unit in the Scottish Studies Award at SCQF level 5. It can also be taken as a freestanding unit. It is suited to learners 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 learners to the wide range of industries and services which use scientific knowledge and laboratory skills in Scotland. Learners 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. Learners 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. Learners will prepare for employment, further education or training through producing their own Curriculum Vitae for a specific job role in a laboratory science setting.

Learners will have the opportunity to reflect on and evaluate their own employability skills and attributes throughout the unit.

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Outcomes

On successful completion of the unit the learner will be able to:

- 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 Produce a Curriculum Vitae for a specific job role in a laboratory science setting.
- 4 Review and evaluate own performance in specified employability skills.

Credit points and level

1 National Unit credit at SCQF level 5: (6 SCQF credit points at SCQF level 5)

Recommended entry to the unit

Entry to this unit is at the discretion of the centre.

Core Skills

Opportunities to develop aspects of Core Skills are highlighted in the support notes for this unit specification.

There is no automatic certification of Core Skills or Core Skill components in this unit.

Context for delivery

If this unit is delivered as part of a course, it is recommended that it should be taught and assessed within the subject area of the course to which it contributes.

The Assessment Support Pack (ASP) for this unit provides assessment and marking guidelines that exemplify the national standard for achievement. Centres wishing to develop their own assessments should refer to the ASP to ensure a comparable standard. A list of existing ASPs is available to download from SQA's website (<http://www.sqa.org.uk/sqa/46233.2769.html>).

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.

Further advice can be found on our website www.sqa.org.uk/assessmentarrangements.

National unit specification: statement of standards

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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

Produce a Curriculum Vitae for a specific job role in a laboratory science setting.

Performance criteria

- (a) List all own skills, qualifications and experience in the Curriculum Vitae.
- (b) Describe own skills, qualities and experience relevant to the job role.
- (c) Explain why these skills, qualities and experience are relevant to the job role.

National unit specification: statement of standards (cont)

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Outcome 4

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.

Evidence requirements for this unit

Evidence is required to demonstrate that learners have achieved all outcomes and performance criteria.

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 learner folio. Progress will be discussed with the teacher/lecturer at appropriate points during the investigations to ensure that the folio is the learner's own work. A record of each discussion must be retained.

Learners will investigate a range of industries and/or services which use laboratory science. Learners will be given a clear brief for the investigation.

Learners are required to:

- ◆ identify **three** industries and/or services which use laboratory science. One must be a local industry and/or service (within Scotland), 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

National unit specification: statement of standards (cont)

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- ◆ 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

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

Outcome 3 — Written and/or oral evidence

Evidence for Outcome 3 will be a completed Curriculum Vitae (CV), relating to a specific laboratory science job role. This could be in relation to the identified role in Outcome 2 which is of personal interest, if appropriate, or another role in the field of laboratory science. Learners will be provided with an appropriate CV template, which they will complete on their own. Evidence will be gathered in open-book conditions at an appropriate point in the unit.

Outcome 4 — Learner reviews

Evidence requirements for Outcome 4 will take the form of **three** completed learner reviews which will give learners the opportunity to record their progress in developing employability skills. Learners will be provided with a review template.

Each review will include the following:

- ◆ A record of the learner'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

National unit specification: Statement of standards (cont)

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- review and self-evaluation skills
- working independently
- ◆ A record of feedback gathered from others in relation to employability skills.

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

- ◆ 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. Learners 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 learner must sign and date each review sheet. The review sheets will be countersigned by the assessor.

When delivering this unit as part of the National 5 Laboratory Science Skills for Work 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.

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

The Assessment Support Pack (ASP) provided for this unit illustrates the standard that should be applied. It contains an investigation template, learner brief, CV template and learner review sheets. If a centre wishes to design its own assessments for this unit, they must be of a comparable standard.

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. Employability is a key aspect of Skills for Work and is present throughout the unit. In addition, there are a number of other skills that learners will be expected to improve on and develop as they undertake this unit, these can be 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
- 1.3 Listening and talking

3 Health and wellbeing

- 3.1 Personal learning
- 3.2 Emotional wellbeing
- 3.4 Planning for, and making, choices and changes
- 3.5 Relationships

4 Employability, enterprise and citizenship

- 4.1 Employability
- 4.3 Working with others

5 Thinking Skills

- 5.1 Remembering
- 5.2 Understanding
- 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 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 national unit support notes.

National unit support notes

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Unit support notes are offered as guidance and 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 an alternative mandatory unit of the National 5 Laboratory Science Skills for Work Course, and is also an optional unit in the Scottish Studies Award at SCQF level 5. It can also be taken as a freestanding unit. It is suited to learners 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 learners to the wide range of industries and services which use scientific knowledge and laboratory skills. Learners will learn about the variety of ways in which science and laboratory skills are used in different industries and services in Scotland and about the job roles which use these skills. Learners 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. Learners will prepare for employment, further education or training through producing their own Curriculum Vitae for a specific job role in a laboratory science setting.

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

Outcome 1

Outcome 1 introduces learners 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.

Learners 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 learner has a particular interest in a specific industry or service which does not fall among those listed, then the learner should be encouraged to include this among their three choices. It is important that learners 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.

National unit support notes (cont)

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Learners 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, learners 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.

Outcome 2

Learners 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.

Learners 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.

Learners 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. Learners 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 learner'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 learners have the opportunity to develop their skills in organising and presenting their findings clearly, an important skill in science careers.

National unit support notes (cont)

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Outcome 3

Whether learners progress to employment or to further education or training, they will be required to complete an application form or produce a Curriculum Vitae. This outcome has been designed to help prepare learners for this process and is intended to give learners the opportunity to produce their own CV to incorporate their own skills, qualifications and experience for a specific job role in a laboratory science setting. Learners may benefit from advice on how to present themselves in a positive manner in the CV. Since learners will have the opportunity to develop and evaluate their employability skills in relation to Outcome 4, they could find this a useful experience that will prepare them for completing their CV and identifying their skills and qualities.

Outcome 4

This outcome is intended to give learners 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

Learners 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
- ◆ 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

National unit support notes (cont)

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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 National 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* (National 5)
- ◆ Participate in practical activities in the units *Laboratory Science: Working in a Laboratory* (National 5) and *Laboratory Science: Practical Skills* (National 5)

Guidance on approaches to delivery of this unit

Outcomes 1 and 2

Learners 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 learners 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 learners to work in groups and share information although the final investigation and folio must be the learner's own work. Learners 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 learners to learn of a wider range of industries and services from the work of other learners in the group.

Outcome 3

Learners could research online tools, eg My World of Work for writing their CVs and/or link with their centre's Careers service, although the final CV must be the learner's own work. They should be encouraged to be honest about their skills, qualifications and experience and add to their CV as they progress through the course.

National unit support notes (cont)

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Outcome 4

Learners 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 National 5 Laboratory Science Course, opportunities to practise employability skills should occur naturally throughout the course.

Guidance on approaches to assessment of this unit

Evidence can be generated using different types of assessment. The following are suggestions only. There may be other methods that would be more suitable to learners.

Centres are reminded that prior verification of centre-devised assessments would help to ensure that the national standard is being met. Where learners experience a range of assessment methods, this helps them to develop different skills that should be transferable to work or further and higher education.

If learners 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 National 5 Laboratory Science Skills for Work Course, it would be appropriate for Outcomes 1 and 2 to be completed and assessed at the beginning of the course and for Outcomes 3 and 4 to be assessed throughout the course so that learners have opportunities to practise and develop the specified employability skills and set and evaluate their goals.

Outcomes 1 and 2

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

Outcome 3

Learners could be referred to the Internet or libraries for information on how to prepare a CV. Visiting speakers may also be a useful resource. The job role identified for the production of the CV should be a realistic one appropriate for someone entering the sector without prior experience.

National unit support notes (cont)

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Outcome 4

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 learner, a placement supervisor or anyone else who has observed the learner and is able to make appropriate comment. The reviews will be completed in supervised open-book conditions. On each occasion the learner will sign and date each review sheet. The review sheets will be countersigned by the assessor.

Opportunities for 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 Communication Technology (ICT), such as e-testing or the use of e-portfolios or social software. Centres which wish to use e-assessment must ensure that the national standard is applied to all learner evidence and that conditions of assessment as specified in the evidence requirements are met, regardless of the mode of gathering evidence. The most up-to-date guidance on the use of e-assessment to support SQA's qualifications is available at www.sqa.org.uk/e-assessment.

Opportunities for developing Core Skills

In this unit learners will be involved in an investigation, production of a CV, and 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, 2 and 3. They will also develop their communication skills in their presentation of their findings for these outcomes.

In Outcome 4 learners 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 learners will choose to use computers either as part of their research methods or whilst preparing their presentation or both. Learners choosing to do this will have the opportunity to develop their Information and Communication Technology skills.

Learners 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.

General information for learners

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This section will help you to decide whether this is the unit for you by explaining what the unit is about, what you should know or be able to do before you start, what you will need to do during the unit and opportunities for further learning and employment.

In this unit you will research a variety and range of industries and services that use laboratory science in Scotland. You will research career opportunities in science laboratories at a local, national and global setting and present your findings. You will investigate the skills, qualifications and experience required for a job role in laboratory science of personal interest to you. You will learn how to produce a Curriculum Vitae (CV) for a specific job role. This could be in relation to the job role of personal interest, or a different role. At different points through this unit you will review your own skills and set personal targets for improvement.

You will be involved in an investigation, production of a CV, and self-evaluation and review of employability skills. You should have the opportunity to practise and develop both Oral and Written Communication skills and your inter-personal skills in working with others in your research. You will also develop communication skills in presentation of your findings.

You must seek the opinion of others on your performance in specified employability skills which gives further opportunities for you to develop both your communication skills and your ability to work with others. If you chose to use a computer either as part of your research method or whilst preparing your presentation you will have the opportunity to develop Information and Communication Technology (ICT) skills.

You will take responsibility for your own performance in the investigation and in the review and evaluation of your employability skills which may develop the three components of Problem Solving: Critical Thinking, Planning and Organising; Reviewing and Evaluating.

Administrative information

Published: June 2017

Superclass: RA

History of changes to National Unit Specification

Version	Description of change	Date

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