



National 5
Course
Specification



National 5 Chemistry Course Specification (C713 75)

Valid from August 2013

First edition: April 2012
Revised: June 2013, version 1.1

This specification may be reproduced in whole or in part for educational purposes provided that no profit is derived from reproduction and that, if reproduced in part, the source is acknowledged. Additional copies of this Course Specification can be downloaded from SQA's website: www.sqa.org.uk.

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

© Scottish Qualifications Authority 2013

Course outline

Course title: National 5 Chemistry
SCQF: level 5 (24 SCQF credit points)
Course code: C713 75

Mandatory Units

Chemical Changes and Structure (National 5)	6 SCQF credit points
Nature's Chemistry (National 5)	6 SCQF credit points
Chemistry in Society (National 5)	6 SCQF credit points

Course assessment **6 SCQF credit points**
This Course includes six SCQF credit points to allow additional time for preparation for Course assessment. The Course assessment covers the added value of the Course. Further information on the Course assessment 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, knowledge and understanding required by one or more of the following or by equivalent qualifications and/or experience:

- ◆ National 4 Chemistry Course or relevant component Units

There may also be progression from National 4 Biology, National 4 Environmental Science, National 4 Physics or National 4 Science Courses.

In terms of prior learning and experience, relevant experiences and outcomes may also provide an appropriate basis for doing this Course.

Progression

This Course or its Units may provide progression to:

- ◆ other qualifications in Chemistry or related areas
- ◆ further study, employment 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

Chemistry, the study of matter and its interactions, contributes essential knowledge and understanding across all aspects of our lives. Chemistry explains the links between the particulate nature of matter and the macroscopic properties of the world. Chemistry research and development is essential for the introduction of new products. The chemical industry is a major contributor to the economy of the country.

An experimental and investigative approach is used to develop knowledge and understanding of chemistry concepts.

The Course provides opportunities for learners to recognise the impact chemistry makes on developing sustainability, and its effects on the environment, on society and on the lives of themselves and others.

Chemistry Courses should encourage resilience, which leads to becoming a confident individual. Successful learners in chemistry think creatively, analyse and solve problems. Chemistry can produce responsible citizens through studying the impact it makes on developing sustainability, and its effect on the environment, society, and the lives of themselves and others.

Purpose and aims of the Course

The purpose of the Course is to develop learners' curiosity, interest and enthusiasm for chemistry in a range of contexts. The key skills of scientific inquiry and investigation are integrated and developed throughout the Course. The relevance of chemistry is highlighted by the study of the applications of chemistry in everyday contexts. This will enable learners to become scientifically literate citizens, able to review the science-based claims they will meet.

The Course gives the opportunities for learners to develop the ability to think analytically, creatively and independently, and to make reasoned evaluations. The

Course covers a variety of contexts relevant to chemistry's impact on the environment and society through the chemistry of the Earth's resources, the chemistry of everyday products and environmental analysis. The Course allows flexibility and personalisation by offering choice in the contexts studied.

The key areas of bonding, the mole and balanced chemical equations are integrated throughout the Course.

It offers a broad, versatile and adaptable skills set which is valued in the workplace, and forms the basis for progress onto study of chemistry at a higher level, while also providing a knowledge base useful in the study of all of the sciences.

The aims of this Course are for learners to:

- ◆ develop and apply knowledge and understanding of chemistry
- ◆ develop an understanding of chemistry's role in scientific issues and relevant applications of chemistry, including the impact these could make in society and the environment
- ◆ develop scientific inquiry and investigative skills
- ◆ develop scientific analytical thinking skills in a chemistry context
- ◆ develop the use of technology, equipment and materials, safely, in practical scientific activities
- ◆ develop planning skills
- ◆ develop problem solving skills in a chemistry context
- ◆ use and understand scientific literacy, in everyday contexts, to communicate ideas and issues and to make scientifically informed choices
- ◆ develop the knowledge and skills for more advanced learning in chemistry
- ◆ develop skills of independent working

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

Chemistry 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 chemistry context. Learners will gain an understanding of chemistry, and develop this through a variety of approaches, including practical activities.

The Course has three mandatory Units, as listed below, which are designed to provide progression to the corresponding Units at Higher.

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.

Chemical Changes and Structure (National 5)

In this Unit, learners will develop scientific skills and knowledge of the chemical reactions in our world. Through practical experience, learners will investigate average rates of reaction and the chemistry of neutralisation reactions. Focusing on these reactions, learners will work towards the concept of balanced chemical equations. Learners will explore the mole concept, formulae and reaction quantities. The connection between bonding and chemical properties of materials is investigated.

Nature's Chemistry (National 5)

The Earth has a rich supply of natural resources which are used by all of us. In this Unit, learners will investigate the physical and chemical properties of cycloalkanes, branched chain alkanes and alkenes, and straight chain alcohols and carboxylic acids. They will explore their chemical reactions and their uses in everyday consumer products. Learners will investigate the comparison of energy from different fuels.

Chemistry in Society (National 5)

In this Unit, learners will develop skills and carry out practical investigations related to the chemistry of materials. Learners will focus on the chemistry of metals and their bonding, reactions and uses. The connection between bonding in plastics, their physical properties and their uses is investigated. Learners will investigate the chemical reactions and processes used to manufacture fertilisers. They will research the use and effect of different types of nuclear radiation. Learners will investigate chemical analysis techniques used for monitoring the environment.

Conditions of award

To gain the award of the Course, the learner must pass all of the Units as well as the Course assessment. The required Units are shown in the Course outline section. Course assessment will provide the basis for grading attainment in the Course award.

Skills, knowledge and understanding

Further information on the assessment of the skills, knowledge and understanding for the Course is given in the *Course Assessment 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 chemistry by making statements, describing information, providing explanations and integrating knowledge
- ◆ applying knowledge of chemistry to new situations, interpreting information and solving problems
- ◆ planning and designing experiments to test given hypotheses or to illustrate particular effects
- ◆ carrying out experimental procedures safely, recording observations and collecting data
- ◆ selecting information and presenting information appropriately in a variety of forms
- ◆ processing information (using calculations and units, where appropriate)
- ◆ making predictions and generalisations based on evidence/information
- ◆ drawing valid conclusions and giving explanations supported by evidence/justification
- ◆ identifying a sources of uncertainties and suggesting improvements to experiments
- ◆ 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).

Assessment

Information about assessment for the Course is included in the *Course Assessment Specification*, which provides full details including advice on how a learner's overall attainment for the Course will be determined.

Unit assessment

All Units are internally assessed against the requirements shown in the *Unit Specification*.

They can be assessed on an individual Unit basis or by using other approaches which combine the assessment for more than one Unit.

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.

Chemical Changes and Structure (National 5)

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
- ◆ draw on knowledge and understanding of the key areas of this Unit and apply scientific skills

Nature's Chemistry (National 5)

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
- ◆ draw on knowledge and understanding of the key areas of this Unit and apply scientific skills

Chemistry in Society (National 5)

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
- ◆ draw on knowledge and understanding of the key areas of this Unit and apply scientific skills

Course assessment

Courses from National 4 to Advanced Higher include assessment of [added value](#)¹. At National 5 the added value will be assessed in the Course assessment. The added value for the Course must 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.

In the National 5 Chemistry Course, added value will focus on breadth, challenge and application.

Learners will draw on, extend and apply the skills they have learned during the Course. This will be assessed within a [question paper](#)² and [assignment](#)³, requiring demonstration of the breadth of skills, knowledge and understanding acquired from across the Units and how they can be applied in unfamiliar contexts and/or integrated ways.

¹ Definitions can be found here: <http://www.sqa.org.uk/sqa/58409.html>

² See link above for definition.

³ See link above for definition.

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

Published: June 2013 (version 1.1)

History of changes to National Course Specification

Course details	Version	Description of change	Authorised by	Date
	1.1	S,K&U section: amendment to wording to clarify activities	Qualification Development Manager	June 2013

This specification may be reproduced in whole or in part for educational purposes provided that no profit is derived from reproduction and that, if reproduced in part, the source is acknowledged. Additional copies of this specification can be downloaded from SQA's website at www.sqa.org.uk.

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

© Scottish Qualifications Authority 2013