

**N5**

National 5
Course Assessment
Specification



National 5 Chemistry Course Assessment Specification (C713 75)

Valid from August 2013

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

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Course outline

Course title:	National 5 Chemistry
SCQF level:	5 (24 SCQF credit points)
Course code:	C713 75
Course assessment code:	X713 75

The purpose of the Course Assessment Specification is to ensure consistent and transparent assessment year on year. It describes the structure of the Course assessment and the mandatory skills, knowledge and understanding that will be assessed.

Course assessment structure

Component 1 — question paper	80 marks
Component 2 — assignment	20 marks
Total marks	100 marks

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.

Equality and inclusion

This Course Assessment Specification has been designed to ensure that there are no unnecessary barriers to assessment. Assessments have been designed to promote equal opportunities while maintaining the integrity of the qualification.

For guidance on assessment arrangements for disabled learners and/or those with additional support needs, please follow the link to the Assessment Arrangements web page: www.sqa.org.uk/sqa/14977.html.

Guidance on inclusive approaches to delivery and assessment of this Course is provided in the *Course Support Notes*.

Assessment

To gain the award of the Course, the learner must pass all of the Units as well as the Course assessment. Course assessment will provide the basis for grading attainment in the Course award.

Course assessment

SQA will produce and give instructions for the production and conduct of Course assessments based on the information provided in this document.

Added value

The purpose of the Course assessment is to assess added value of the Course as well as confirming attainment in the Course and providing a grade. The added value for the Course will 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 this Course assessment, added value will focus on the following:

- ◆ breadth — drawing on knowledge and skills from across the Course
- ◆ challenge — requiring greater depth or extension of knowledge and/or skills
- ◆ application — requiring application of knowledge and/or skills in practical or theoretical contexts as appropriate

This added value consists of:

- ◆ a question paper, which requires learners to demonstrate aspects of breadth, challenge and application; learners will apply breadth and depth of skills, knowledge and understanding from across the Course to answer questions in chemistry
- ◆ an assignment, which requires learners to demonstrate aspects of challenge and application; learners will apply skills of scientific inquiry, using related knowledge, to carry out a meaningful and appropriately challenging task in chemistry and communicate findings

Grading

Course assessment will provide the basis for grading attainment in the Course award.

The Course assessment is graded A–D. The grade is determined on the basis of the total mark for all Course assessments together.

A learner's overall grade will be determined by their performance across the Course assessment.

Grade description for C

For the award of Grade C, learners will have demonstrated successful performance in all of the Units of the Course. In the Course assessment, learners will typically have demonstrated successful performance in relation to the mandatory skills, knowledge and understanding for the Course.

Grade description for A

For the award of Grade A, learners will have demonstrated successful performance in all of the Units of the Course. In the Course assessment, learners will typically have demonstrated a consistently high level of performance in relation to the mandatory skills, knowledge and understanding for the Course.

In addition, learners achieving a Grade A will have demonstrated a high overall level of performance by:

- ◆ retaining knowledge and understanding over a long period of time
- ◆ showing a deeper level of knowledge and understanding
- ◆ integrating and applying skills, knowledge and understanding across the three component Units of the Course
- ◆ displaying problem solving skills in less familiar and more complex contexts
- ◆ applying skills of scientific inquiry and analytical thinking in complex contexts that involve more complex data

Credit

To take account of the extended range of learning and teaching approaches, remediation, consolidation of learning and integration needed for preparation for external assessment, six SCQF credit points are available in Courses at National 5 and Higher, and eight SCQF credit points in Courses at Advanced Higher. These points will be awarded when a grade D or better is achieved.

Structure and coverage of the Course assessment

The Course assessment will consist of two Components: a question paper and an assignment. The question paper will have two Sections. The assignment will have one Section.

Component 1 — question paper

The purpose of the question paper is to assess breadth and depth of knowledge and understanding from across the Units.

The paper will assess scientific inquiry skills, analytical thinking skills and the impact of applications on society and the environment.

The question paper will give learners an opportunity to demonstrate the following skills, knowledge and understanding by:

- ◆ 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 or designing experiments to test given hypotheses or to illustrate particular effects, applying safety measures
- ◆ 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 sources of uncertainties and suggesting improvements to experiments

The mandatory skills and knowledge are specified in the 'Further mandatory information on Course coverage' section at the end of this Course Assessment Specification.

The question paper will have 80 marks out of a total of 100 marks. This is 80% of the overall marks for the Course assessment.

The question paper will have two Sections.

Section 1 (Objective Test) will have 20 marks.

Section 2 will contain restricted and extended response questions and will have 60 marks.

Marks will be distributed approximately proportionally across the Units.

The majority of the marks will be awarded for applying knowledge and understanding. The other marks will be awarded for applying scientific inquiry, scientific analytical thinking and problem solving skills.

A data booklet containing relevant data and formulae will be provided.

Component 2 — assignment

This assignment requires learners to apply skills, knowledge and understanding to investigate a relevant topic in chemistry and its effect on the environment and/or society. The effect may be positive and/or negative. The topic should draw on one or more of the key areas of the Course, and should be chosen with guidance from the assessor.

The assignment will assess the application of skills of scientific inquiry and related chemistry knowledge and understanding.

The assignment will give learners an opportunity to demonstrate the following skills, knowledge and understanding by:

- ◆ applying knowledge of chemistry to new situations and interpreting information
- ◆ selecting information and presenting information appropriately in a variety of forms
- ◆ processing the information (using calculations and units, where appropriate)
- ◆ drawing valid conclusions and giving explanations supported by evidence/justification
- ◆ communicating findings/information

The assignment will have 20 marks out of a total of 100 marks. This is 20% of the overall marks for the Course assessment.

The majority of the marks will be awarded for applying scientific inquiry and analytical thinking skills. The other marks will be awarded for applying knowledge and understanding related to the topic chosen.

The assignment offers challenge by requiring skills, knowledge and understanding to be applied in a context that is one or more of the following:

- ◆ unfamiliar
- ◆ familiar but investigated in greater depth
- ◆ integrates a number of familiar contexts

This assignment has two stages:

- ◆ a research stage
- ◆ a communication stage

In the course of their assignment, learners are required to:

- ◆ choose, with support, a relevant topic in chemistry that has an effect on the environment and/or society
- ◆ devise an appropriate aim
- ◆ describe the relevant application(s) of chemistry and explain the effect on the environment/society
- ◆ research the topic by selecting, processing and presenting relevant data/information
- ◆ draw a conclusion
- ◆ describe underpinning chemistry knowledge and understanding and explain its relevance to the topic researched
- ◆ communicate the findings of the research in a report

Setting, conducting and marking of assessment

Question paper

This question paper will be set and marked by SQA, and conducted in centres under conditions specified for external examinations by SQA. Learners will complete this in 2 hours.

Controlled assessment — assignment

This assignment is:

- ◆ set by centres within SQA guidelines
- ◆ conducted under a high degree of supervision and control

Evidence will be submitted to SQA for external marking.

All marking will be quality assured by SQA.

Setting the assessment

Set by centres within SQA guidelines.

Conducting the assessment

The **research** stage will be conducted under some supervision and control.

The **communication** stage will be conducted under a high degree of supervision.

SQA will provide Assignment General assessment information and Assignment Assessment task documents. SQA will specify the material to be taken into the communication stage of the assignment.

The production of the report will be carried out:

- ◆ in time to meet a submission date set by SQA
- ◆ independently by the learner

Further mandatory information on Course coverage

The following gives details of mandatory skills, knowledge and understanding for the National 5 Chemistry Course. Course assessment will involve sampling the skills, knowledge and understanding. This list of skills, knowledge and understanding also provides the basis for the assessment of Units of the Course.

The following gives details of the skills:

- ◆ 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

These skills will be assessed, across the Course, in the context of the mandatory knowledge.

The following table specifies the mandatory knowledge for the National 5 Chemistry Course.

Chemical Changes and Structure
Rates of reaction <ul style="list-style-type: none">◆ Average rate of reaction calculated from graph to show change in rate of reaction as reaction progresses
Atomic structure and bonding related to properties of materials <ul style="list-style-type: none">◆ Nuclide notation; isotopes and relative atomic mass; ions, ionic bonding◆ Covalent molecular, covalent network and ionic lattices◆ Physical properties of chemicals explained through bonding◆ Chemical and ionic formulae including group ions
Formulae and reaction quantities <ul style="list-style-type: none">◆ Balanced equations including state symbols◆ Gram formula mass, the mole, calculations relating mass, volume of solution, concentration and moles
Acids and bases <ul style="list-style-type: none">◆ Dissociation of water into hydrogen and hydroxide ions◆ pH is related to the concentration of hydrogen and hydroxide ions in pure water, acids and alkalis◆ Neutralisation titration

Nature's Chemistry

Homologous series

- ◆ The study of cycloalkanes and branched chain alkanes and alkenes (up to C₈)
- ◆ To include their physical, chemical properties, general formulae, systematic names, structural formulae, uses, and isomers.
- ◆ Reactions, combustion and addition

Everyday consumer products

- ◆ Uses of alcohols and carboxylic acids: to include their physical, chemical properties
- ◆ For straight chain alcohols and carboxylic acids (C₁–C₈) general formulae, systematic naming, structural formulae,
- ◆ Functional group in alcohols, carboxylic acids and esters.
- ◆ Manufacture of esters as a use of alcohols and carboxylic acids
Uses of esters

Energy from fuels

- ◆ Energy calculations involving $E_r = cm\Delta T$ (There is no requirement to calculate enthalpy per mole)
- ◆ Calculations based on balanced equations

Chemistry in Society

Metals

- ◆ Metallic bonding and resulting electrical conductivity
- ◆ Balanced ionic equations for reactions of metals, extraction of metals and reduction reactions
- ◆ Electrochemical cells including a non-metal electrode
- ◆ Reactions of metals — electron flow
- ◆ Redox reaction, oxidation, reduction
- ◆ Fuel cells and rechargeable batteries

Properties of plastics

- ◆ Addition and condensation polymerisation including polythene and polyesters
- ◆ Representation of the structure of monomers and polymers, natural polymers

Fertilisers

- ◆ The Haber process to produce ammonia; commercial production of nitrate fertilisers
- ◆ Percentage mass compositions of fertilisers

Nuclear chemistry

- ◆ Radiation process, alpha, beta and gamma radiation; specific properties mass, charge and ability to penetrate different materials
- ◆ Nuclear equations
- ◆ Uses of radioisotopes
- ◆ Half-life
- ◆ Use of radioisotopes to date materials

Chemical analysis

- ◆ Techniques for monitoring the environment and methods for reducing pollution, and titration with calculations

Administrative information

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History of changes to Course Assessment Specification

Course details	Version	Description of change	Authorised by	Date
	1.1	Further information and clarification on scope and structure of the question paper/ assignment given in the 'Structure and coverage of Course assessment' section. Setting, conducting and marking of assessment section: wording added to clarify assessment conditions; Further mandatory information section: amendment to wording to clarify activities in skills list, plus changes to wording in Course/Unit content to clarify meaning and benchmarking	Qualifications Development Manager	June 2013

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