Chemistry (National 5)

Draft National Course Assessment Specification

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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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Contents

Course outline **3**

Course assessment structure 3

Equality and inclusion 3

Assessment **4**

Course assessment 4

Added value 4

Grading 4

Structure and coverage of the Course assessment 6

Setting, conducting and marking of assessment 8

Further mandatory information on Course coverage 9

Administrative information **12**

Course outline

Course title:	Chemistry (National 5)
SCQF level:	6 (24 SCQF credit points)
Course code:	to be advised
Course assessment code:	to be advised

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 for 40 additional programmed hours to allow 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 will be provided in the *Course Support Notes*.

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Assessment

To gain the award of the Course, the learner must pass all 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 assessed
- 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.

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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.

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.

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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 this question paper is to assess breadth of knowledge from across the Units, depth of understanding, and application of this knowledge and understanding to solve problems and to explain the impact of chemistry applications on society/the environment.

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

- integrate and apply chemistry knowledge and understanding
- apply scientific inquiry skills
- apply scientific analytical thinking skills
- explain the impact of chemistry applications on society/the environment

The question paper will have 80 marks (80% of the total mark).

This question paper has two Sections.

Section 1, titled 'Objective Test,' will have 20 marks.

Section 2, titled 'Paper 2', will contain restricted and extended response questions and will have 60 marks.

Marks will be distributed approximately evenly across the three Units.

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

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

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Component 2 — assignment
The purpose of this assignment is to assess the application of skills of scientific investigation/research and explain the impact of chemistry applications on society/the environment, using related knowledge by carrying out a meaningful and appropriately challenging task in chemistry and communicating findings.

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

- investigate/research an appropriate chemistry topic/issue
- process the information gathered, using scientific investigative/research skills
- apply knowledge and understanding related to the topic/issue
- present a reasoned and well-developed conclusion, supported by evidence

The assignment will have 20 marks (20% of the total marks).

This assignment has one Section.

The majority of the marks will be awarded for applying scientific investigative/research skills. The other marks will be awarded for applying related knowledge and understanding.

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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 1 hour and 30 minutes.

Controlled assessment — assignment

This assignment is:

- set by SQA
- 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.

Learners will complete the write-up of this assignment in no more than one hour and under open book, supervised conditions.

SQA will provide an assignment specification for the generation of evidence. Learners will have a choice of topic/issue to be investigated/researched. SQA will specify the extent of the material to be taken into the write-up.

The production of evidence for assessment will be conducted:

- with the use of specified resources
- in time to meet a submission date set by SQA
- independently by the learner

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Further mandatory information on Course coverage

The following gives details of mandatory skills, knowledge and understanding for the Chemistry (National 5) 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 of scientific inquiry, investigation and analytical thinking. Learners should be able to:

- apply knowledge and understanding of chemistry to unfamiliar situations, interpret information and solve problems
- select information from a variety of sources
- present information appropriately in a variety of forms
- process information, using calculations where appropriate
- plan, design and carry out investigations/research to test hypotheses or to illustrate effects
- evaluate experimental procedures
- draw valid conclusions and give explanations supported by evidence or justification
- make predictions and generalisations based on evidence/information
- communicate findings

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

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

Chemical Changes and Structure
Rates of reaction ♦ Average rate of reaction calculated from graph **Atomic structure and bonding related to properties of materials** ♦ Nucleotide notation; isotopes and relative atomic mass; ions, ionic bonding ♦ Covalent molecular, covalent network and ionic lattices ♦ Chemical and ionic formulae including group ions ♦ Physical properties of chemicals explained through bond **Formulae and reaction quantities** ♦ Balanced equations ♦ Gram formula mass, calculations relating mass, volume, concentration and moles **Acids and bases** ♦ 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 ♦ Definitions of strong and weak alkalis on degree of dissociation and related chemical properties ♦ Acid/alkalis titration

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Nature's Chemistry
Homologous series The study of straight and branched chained: ♦ cycloalkanes ♦ alkanols ♦ alkanoic acids ♦ esters To include their physical, chemical properties, general formulae, systematic names, structural formulae and uses ♦ Isomers **Chemical reactions** ♦ Addition, hydrolysis and condensation reactions **Energy from fuels** ♦ Energy calculations involving $\Delta E = CM\Delta T$ ♦ 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 ♦ Reducing agents ♦ Ion electron equations of corrosion and chemical protection of metals ♦ Electrochemical cells including a non-metal electrode ♦ Redox reaction, oxidation, reduction ♦ Fuel cells and rechargeable batteries **Properties of plastics** ♦ Addition and condensation polymerisation including polythene, polyesters and polyamides ♦ Representation of the structure of monomers and polymers, natural polymers ♦ Products of burning plastics **Ceramic materials** ♦ Properties and uses **Energy changes of chemical reactions** ♦ Overall energy changes from bond breaking and bond making **Agrochemicals** ♦ The Haber process to produce ammonia; commercial production of nitrate fertilisers ♦ Percentage mass compositions of fertilisers **Chemical analysis** ♦ Techniques for monitoring the environment and methods for reducing pollution, titration with calculations

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Nuclear chemistry
Formation of elements, radioactive unstable nuclei link between the proton:neutron ratio and stability; background radiation; radiation process, alpha, beta and gamma radiation; specific properties mass, charge and ability to penetrate different materials; half-life; use of isotopes to date materials; uses of both nuclear fusion and nuclear fission reactions; nuclear equations

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Administrative information

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Superclass: to be advised

History of changes

Course details	Version	Description of change	Authorised by	Date

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