National Added Value Unit Specification

Unit title: Chemistry Added Value Unit (National 4)

SCQF: level 4 (6 SCQF credit points)

Unit code: to be advised

Unit outline

This is the Added Value Unit in the Chemistry (National 4) Course. The general aim of this Unit is to enable the learner to provide evidence of added value for the Chemistry (National 4) Course through the successful completion of an assignment and test which will allow the learner to demonstrate challenge and application in skills of scientific inquiry, investigation, analytical thinking and knowledge and understanding. Learners will investigate a topical chemical issue using knowledge and skills drawn from *Chemical Changes and Structure*, *Nature's Chemistry*, or *Chemistry in Society* contexts. Learners are also required to demonstrate their understanding of atomic structure and chemical reactions, properties and concepts.

In the assignment, learners will use a variety of approaches and will consider applications of chemistry on our lives, as well as environmental/ethical implications. They will communicate information related to their method used or their record of process, findings and conclusion, which will allow demonstration of scientific literacy skills. Learners will also demonstrate their underpinning knowledge and understanding of chemistry in a test.

Learners who complete this Unit will be able to:

1 Investigate a topical issue in chemistry and how it affects society and/or the environment
2 Apply understanding of chemistry to atomic structure, reactions, properties and concepts

This Unit is a mandatory Unit of the Chemistry (National 4) Course and is also available as a free-standing Unit. The Unit Specification should be read in conjunction with the *Course Support Notes* which provide advice and guidance on delivery and assessment approaches. Exemplification of the assessment in this Unit is given in the *National Assessment Resource.*

Recommended entry

Entry to this Unit is at the discretion of the centre. It is recommended that the learner should be in the process of completing, or have completed, the following Units in the Chemistry (National 4) Course:

- Chemistry: Chemical Changes and Structure (National 4)
- Chemistry: Nature's Chemistry (National 4)
- Chemistry: Chemistry in Society (National 4)

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. For further information please refer to the *Course Support Notes.*

Standards

Outcomes and assessment standards

Outcome 1

The learner will:

1 Investigate a topical issue in chemistry and how it affects society and/or the environment by:

1.1 Choosing, with support, a topical issue in chemistry
1.2 Outlining key aspects of the issue
1.3 Planning, with support, how to investigate the issue
1.4 Carrying out the investigation
1.5 Drawing straightforward, reasoned conclusions based on knowledge and understanding of the chemistry of the issue
1.6 Explaining how the issue might affect the society and/or the environment
1.7 Communicating the findings of the investigation

Outcome 2

The learner will:

2 Apply understanding of chemistry to atomic structure, reactions, properties and concepts by:

1.1 Describing chemical processes, reactions and concepts
1.2 Solving given problems, including making predictions and calculations
1.3 Describing practical applications in real-life situations

Evidence Requirements for the Unit

This Added Value Unit is assessed by the teacher/lecturer.

Evidence for this Unit will be generated through an assignment on a topical issue, using skills and knowledge drawn from *Chemical Changes and Structure*, *Nature's Chemistry*, or *Chemistry in Society* contexts; and a test.

Evidence is required to show that the learner has met the Outcomes and Assessment Standards.

Outcome 1
The topical issue of applying chemistry knowledge to provide explanations could involve either a negative or positive impact on society/environment. This could be from an unfamiliar context or from a familiar context investigated in greater depth, or from integrating aspects of one or more Units.

The assignment topic will be agreed between the learner and the teacher/lecturer.

- The assignment should be carried out under open-book conditions.
- The teacher/lecturer will provide overall guidelines for the assignment, which will lead learners through the assignment in clear stages.

- The teacher/lecturer may also give learners support and guidance to help them progress through each stage of the assignment.
- Evidence should include:
  - the method used or record of process
  - the findings and conclusions

Learners should have flexibility in how they communicate their method used or their record of process, findings and conclusions. This can include one or more of the following:

- a written report
- an oral presentation which may be supplemented by additional material
- an audio/visual or digital presentation using ICT
- a learning log or journal which may be in electronic or digital form

Outcome 2
The test will assess learners' underpinning knowledge and understanding of atomic structure and the chemistry of reactions, properties and concepts selected from across the Course.

- Learners will complete the test under closed-book conditions.
- Data booklets and calculators can be used.
- The test will consist of short response questions.
- The duration of the test should be no more than 40 minutes.

Further information is provided in the exemplification of assessment in the *National Assessment Resource*. Advice and guidance on possible approaches to assessment is provided in the *Course Support Notes.*

Development of skills for learning, skills for life and skills for work

Please refer to the Course Specification for information about skills for learning, skills for life and skills for work.

Further mandatory information on Course coverage for the Chemistry (National 4) Course

The following gives mandatory skills, knowledge and understanding for the Chemistry (National 4) Course. Assessment of this Added Value Unit will involve selecting appropriate skills, knowledge and understanding from those listed below, in line with the Evidence Requirements above. This list of skills, knowledge and understanding also provides the basis for the assessment of all of the Units in the Course.

Chemistry: Chemical Changes and Structure (National 4)

Atomic structure and bonding related to properties of materials

- basic atomic structure and bonding
- chemical names, formulae and simple equations along with relative formula mass
- patterns of physical properties of chemicals linked to their bonding

Acids and bases

- the effect of soluble oxides on the pH of water; natural and synthetic production of non-metal oxides and their environmental impact; uses of acids in food and drink and their impact on health
- neutralisation reactions to produce water and a named salt; selection of appropriate base based on physical properties

Chemistry: Nature's Chemistry (National 4)

Fossil fuels

- description of formation and extraction processes; current uses of fossil fuels
- hydrocarbons — introducing calculations involving mass balance
- environmental impact of the use of fuels — carbon cycle
- alternative energy sources, including biomass, hydrogen, ethanol and biodiesel

Foods

- carbohydrates, fats and oils from plants, exothermic reactions involving combustion of foods
- alcoholic drinks: sources and production
- units in drinks, and health issues and law
- photosynthesis and relevance to carbon cycle

Plants to products

- manufacturing processes — plants used to make everyday consumer products

Chemistry: Chemistry in Society (National 4)

The properties of metals

- metals' reactions and corrosion of metals and alloys
- percentage composition of ores

The properties of materials

- ceramics
- plastics
- natural resources
- novel substances
- design and properties

Sustainable chemistry

- research the use of chemicals in society with an emphasis on economic and environmental issues

Administrative information

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Superclass: to be advised

History of changes

Version	Description of change	Authorised by	Date