

Chemistry (Salters) - Student Guide for Advanced Subsidiary/Advanced GCE Specifications

Chemistry is the study of the properties and reactions of substances. It is a science subject, so practical work is an important element.

Before you start this course

You should have studied Science to Intermediate level (either GCSE or GNVQ Intermediate) or Chemistry to GCSE.

Other subjects that would go well with Chemistry at AS or GCE Advanced level are Biology, Mathematics and Physics. However, other combinations of subjects including Geology and Geography are also suitable. You may be concentrating on arts, humanities or modern language subjects and wish to take Chemistry to AS level to broaden your studies by continuing to take a science subject.

With a qualification in Chemistry you could go on to Further or Higher Education, studying Chemistry or one of the other sciences or related subjects, such as Medicine, Pharmacy, Veterinary Science or Chemical Engineering, or work in science-based industry, the medical field or agriculture.

This subject has 6 Units of Assessment:

- To get a certificate for Advanced Subsidiary (AS), you will need to have been assessed on your performance in three AS units.
- To get a certificate for Advanced GCE, you will need to have been assessed on your performance in the three AS Units, together with three further units, known as A2 units.

The specification is related to the Salters Advanced Chemistry Course developed in the Science Education group at the University of York in collaboration with OCR. The course offers an innovative approach to teaching and learning chemistry in which chemical principles are developed through modern applications of chemistry.

The Salters Advanced Chemistry course is divided into thirteen teaching sections (themes), six in AS and seven in A2. A visit to a chemical industry is a recommended part of the course.

Each theme is supported by materials for both students and teachers. There are three parts:

- a Storyline provides the settings within which the chemistry and skills are developed
- the Chemical Ideas provide the underlying chemical principles
- Activities provide practical work as well as many other types of activities, including research exercises, group discussions, applications of IT, etc.

Before taking the AS units of assessment you will study the following modules of work:

Module 2850 Chemistry for Life

In this module you will study **two** themes:

The Elements of Life is a study of the elements in the human body, the solar system and the universe. It is designed to provide a bridge from GCSE and you will learn about atomic and nuclear structure, chemical calculations, the development of the Periodic Table, Group 2 chemistry and chemical bonding.

Developing Fuels is a study of fuels and the contribution that chemists make to the development of better fuels. Through this you will learn about thermochemistry, homologous series and alkanes, isomerism and catalysis.

A 90 minute written examination (unit of assessment) will test your understanding of this module.

Module 2851 From Minerals to Medicines

In this module you will study **four** themes:

From Minerals to Elements is a study of the extraction and uses of two elements, bromine and copper. You will learn about halogen chemistry and the major classes of chemical reactions: acid-base, redox and precipitation.

The Atmosphere is a study of two important chemical processes, the depletion of ozone in the upper atmosphere and the greenhouse effect in the lower atmosphere. In this setting you will learn about the interaction of radiation and matter, radicals, rates of reaction, organic halogen compounds and chemical equilibrium.

The Polymer Revolution tells the story of the development of addition polymers, many of which were the result of 'accidental' discoveries. You will learn about alkenes and intermolecular forces.

What's in a Medicine? is the story of aspirin and illustrates some of the features of the pharmaceutical industry. You will learn about the chemistry of organic molecules containing the $-OH$ group and the use of mass spectrometry and infrared spectroscopy in determining the structure of organic molecules.

A 2 hour written examination (unit of assessment) will test your understanding of this module.

Module 2852 Skills for Chemistry

This is a coursework module in which you will build up basic chemical skills in communication and practical and investigative work. There are two components to the assessment of this module:

2852/1 The Open-Book Paper

This is a written paper taken over a two week period. You will be supplied with two related scientific articles on a topic of current interest. You have to research the topic and produce a 1000-word report addressing the issues on the question paper, together with a 50-word summary of your report.

2852/2 Experimental Skills

Four practical skill areas are assessed through a range of activities.

Before taking the A2 units of assessment you will study the following modules of work:

Module 2853 Polymers, Proteins and Steel

In this module you will study three themes:

In **Designer Polymers** you will continue the story of polymers with a study of condensation polymers, such as nylon and Kevlar, designed to have particular properties. You will learn more about polymer chemistry and the chemistry of carboxylic acids and their derivatives.

Engineering Proteins is a study of proteins, the role of DNA in protein synthesis and the use of chemistry to 'engineer' proteins with particular properties. You will learn about the chemistry of organic nitrogen compounds, nuclear magnetic resonance spectroscopy, equilibrium constants and study rates of reactions quantitatively.

The Steel Story focuses on steel as a material, the processes used to make it and prevent its corrosion. You will learn about redox and electrochemistry, d-block elements and complex formation.

A 90 minute written examination (unit of assessment) will test your understanding of this module.

The assessment structure for Chemistry (Salters) is:

Module 2854 Chemistry by Design

In this module you will study four themes:

Aspects of Agriculture is a study of the contribution that chemistry makes to ensuring a safe and sufficient food supply. You will learn about the structure of silicates and clays in soils, ion exchange reactions, nitrogen chemistry and the relationship between the properties of a substance and its structure and bonding.

Colour by Design explains why some compounds are coloured and describes the use of chemistry to provide colours to order. You will learn about analytical techniques, ultraviolet and visible spectroscopy and the chemistry of aromatic compounds.

The Oceans describes the role of the oceans in regulating the climate, in forming rocks and in supporting life. You will learn about ionic solutions and precipitation, acid-base equilibria and entropy.

Medicines by Design concerns the effects of chemicals on the body. You will learn about molecular recognition, carbonyl compounds and synthetic routes to organic molecules.

Visiting the Chemical Industry is also included in this module.

A 2 hour written examination (unit of assessment) will test your understanding of this module. This is a synoptic paper and will test the knowledge, understanding and skills you have learnt throughout the course.

Module 2855 Individual Investigation

This is a coursework module. You will be assessed on the four practical skill areas through an extended practical investigation of a topic of your own choice.

Unit 2850

Chemistry for Life
(The Elements of Life and Developing Fuels)

Examination: 90 marks (15%), 1½ hours, compulsory short answer questions and questions requiring a longer answer.

+

Unit 2851

From Minerals to Medicines
(From Minerals to Elements, The Atmosphere, The Polymer Revolution and What's in a Medicine?)

Examination: 120 marks (20%) 2 hours, compulsory short answer questions and questions requiring a longer answer

+

Unit 2852

Skills for Chemistry

This is made up of two components:
Coursework: 90 marks (15%)

Unit 2852/1
Open Book Paper

Externally-assessed coursework: 45 marks, a 1,000-word report and 50-word summary, written over 2 weeks in response to questions on the examination paper.

Unit 2852/2
Experimental Skills

Internally-assessed coursework: 45 marks, separate assessment of 4 practical skill areas.

= AS

+

Unit 2853

Polymers, Proteins, and Steel
(Polymers by Design, Engineering Proteins and The Steel Story)

Examination: 90 marks (15%), 1½ hours, compulsory short answer questions and questions requiring a longer answer.

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Unit 2854

Chemistry by Design
(Aspects of Agriculture, Colour by Design, The Oceans, Medicines by Design and Visiting the Chemical Industry)

Examination: 120 marks (20%), 2 hour, synoptic paper, compulsory short answer questions and questions requiring a longer answer.

+

Unit 2855

Individual Investigation

Examination: 90 marks (15%), assessment of 4 practical skill areas in the context of a single extended practical investigation.

= A2