



# A Level Chemistry Course Outline

## Overview

The A Level chemistry courses have been designed to be a practical experience, with students undertaking both practical and theory work. The practical activities included will help the students to consolidate their understanding of the main aspects of chemistry and equip them with the skills required to study this subject at higher levels. The course is designed to prepare students for progression either into higher education or employment and to develop their interest and enthusiasm in chemistry. Students will study, amongst many topics, aspects of chemistry that are often seen in the media or that affect their lives; including green chemistry, pharmaceuticals and climate change. It also aims to help the students to appreciate how society makes decisions about scientific issues and how science contributes to the success of the economy and society, developing a deeper understanding of 'How Science Works' and how areas of the subject relate to each of us and to the world around us.

## Course Structure & Content

### Year 12

**Module 1: Development of Practical Skills** (this module bridges both years of the course).

- Planning, implementing, analysis and evaluation of practical work undertaken

**Module 2: Foundations of Chemistry**

- Atoms, compounds, molecules and equations; amount of substance; acid – base and redox reactions; electrons, bonding and structure

**Module 3: Periodic Table and Energy**

- The Periodic Table and periodicity; Group 2 and Group 7; Qualitative analysis; enthalpy changes; reaction rates and equilibrium (qualitative)

**Module 4: Core Organic Chemistry**

- Basic concepts; hydrocarbons; alcohols and haloalkanes; organic synthesis; analytical techniques (infra-red and mass spectroscopy)

### Year 13

**Module 5: Physical chemistry and Transition Elements**

- Reaction rates and equilibrium (quantitative); pH and buffers; enthalpy, entropy and free energy; redox and electrode potentials; transition elements

**Module 6: Organic Chemistry and Analysis**

- Aromatic compounds; carbonyl compounds; carboxylic acids and esters; nitrogen compounds; polymers; organic synthesis; chromatography and spectroscopy (nuclear magnetic resonance)

## Assessment

The **A Level** is assessed by three written papers and a coursework component:

- **Paper 1** (2 hrs 15 minutes): Periodic table, elements and physical chemistry; a combination of multiple choice and structured questions examining theory and practical skills based on modules 1, 2, 3, and 5. (37%)
- **Paper 2** (2 hrs 15 minutes): Synthesis and analytical techniques; a combination of multiple choice and structured questions examining theory and practical skills based on modules 1, 2, 4, and 6. (37%)
- **Paper 3** (1 hr 30 minutes): Unified chemistry; a combination of multiple choice and structured questions examining theory and practical skills based on all modules (26%).
- **Practical Endorsement for Chemistry** – Candidates complete a minimum of 12 practical activities and investigations covering key skills and topic areas over the two year course. Evidence of candidates meeting a series of competencies in practical skills is assessed by class teachers and moderated externally. Performance in this assessment is reported separately to the A Level grade as a pass/fail certificated endorsement. It does not count towards the final A Level grade.

## Entry Qualifications

GCSE grade 6/6 in core and additional science or grade 6/6/5 (6 in chemistry) if the triple science route was followed at GCSE. Students applying for this course must also have a grade 6 in mathematics and should be prepared to complete high levels of independent study and must therefore show interest and motivation for the subject.

## Career Prospects

Success in A Level chemistry paves the way for many and varied possible progressions. It is also a very useful A Level for continuing on to a wide variety of different higher education courses. A few of the many careers that a chemistry A Level could lead to are pharmacology, research and development forensic science and engineering, as well as law, journalism and education.