



Chemistry

Chemistry is the science of matter, what it is made from, what its properties are, how it is structured and how it reacts. It is the central science, overlapping with aspects of both Biology and Physics. By studying Chemistry you will develop not only a much deeper understanding of chemical principles but you will also improve your analytical and evaluative skills as well as your ability to communicate effectively and to problem solve. It is an inherently practical subject and in all years there will be a significant amount of practical work undertaken.

Key Stage 3

Chemistry is divided into a number of topics which span Years 7 - 8. The emphasis is on scientific enquiry, such as scientific evidence and investigative skills, as well as chemical knowledge, skills and understanding.

During the course the students will study a wide range of topics which include particle theory, practical techniques, acids and alkalis, elements, compounds and mixtures, metals and reactivity.

Year 7

Students in Year 7 will be taught Science by one (or in some cases two) members of staff. Throughout the year they will study units in Biology, Chemistry and Physics. Roughly equal lengths of time will be spent studying each discipline over the year.

Many of the skills required to study Biology, Chemistry or Physics are common to all three subjects and so at the start of the year students will study an Introduction to completing investigations.

The Topics that the students will study in Year 7 will be:

Biology	Physics	Chemistry
Cells, tissues and organs Classification Reproduction	Sound Light Forces	The Properties of Substances (solids liquids and gases) Separating Substances Chemical reactions

Year 8

Students in Year 8 continue their study of Science as three separate subjects from now onwards and will have three teachers: one each for biology, chemistry and physics. They will have two chemistry lessons per fortnight.

During the course the students will study a wide range of topics which include particle theory, practical techniques, acids and alkalis, materials, metals and reactivity.

Key Stage 4 GCSE Chemistry

From Year 9 onwards students will study the AQA Chemistry Specification. The specification provides the basis for a wide range of studies which include atomic structure, bonding, quantitative chemistry, analytical techniques and the periodic table. The emphasis is very much on the students acquiring a sound factual base which can be applied to new situations, as well as learning to employ the correct chemical terminology. The development of a sound understanding of *How Science Works* will also be essential to success in the GCSE Sciences.

Practical work is an integral part of Chemistry and the students will complete practical work throughout the course both to extend their understanding and to reinforce the theory taught in lessons.



The content of the course and practical skills will be assessed through written examinations at the end of Year 11. More information can be obtained from www.aqa.org.uk.

Sixth Form studies

Chemistry is one of the most popular courses in the Sixth Form with a large proportion of the year group studying the subject. It is an essential requirement for students considering careers in Medicine, Veterinary Science or Dentistry as well as being good preparation for many other careers due to its emphasis on logical thinking and problem-solving.

A level Chemistry

At A-level students study the OCR Chemistry A specification. The aim of the course is to encourage the students to:

- develop their interest in, and enthusiasm for chemistry, including developing an interest in further study and careers in chemistry;
- appreciate how society makes decisions about scientific issues and how the sciences contribute to the success of the economy and society;
- develop and demonstrate a deeper appreciation of the skills, knowledge and understanding of *How Science Works*;
- develop essential knowledge and understanding of different areas of chemistry and how they relate to each other.

The course is a linear in nature and contains content designed to be taught in Year 12 that then builds to support the content taught in Year 13. The only external assessment of the course will come at the end of Year 13 where students will sit 3 written examinations that will cover both the theoretical content of the course and also the practical skills they will have developed throughout their 2 years of study. The first 2 written papers tests content and application as well as practical skills. The third paper is a synoptic paper that will bring together many areas of chemistry and tests the student's ability to apply knowledge to new and unseen scenarios (this will contribute 26% of the final grade).

The course is composed of 6 modules with a prescribed practical component which is called the practical endorsement. There is no traditional internally assessed coursework within the course; however, practical skills can and will be assessed within the written papers. The practical endorsement is awarded in addition to the A level grade and is rated as pass or not classified.

The list below shows an outline of the content of the course. For more information access www.ocr.org.uk

Year 12	Year 13
Atoms, compounds, molecules and equations	Reaction rates and equilibrium (quantitative)
Amount of substance	pH and buffers
Acid-base and redox equations	Enthalpy, entropy and free energy
Electrons, bonding and structure	Redox and electrode potentials
The periodic table and periodicity	Transition elements
Group 2 and the halogens	Aromatic compounds
Qualitative analysis	Carbonyl compounds
Enthalpy changes	Carboxylic acids and esters
Reaction rates and equilibrium (qualitative)	Nitrogen compounds
Basic concepts of organic chemistry	Polymers
Hydrocarbons	Organic synthesis
Alcohols and haloalkanes	Chromatography and spectroscopy (NMR)
Organic synthesis	
Analytical techniques (IR and MS)	



Extra-Curricular Chemistry

Year 7 Science Club

The Year 7 science club is held twice a half term and is an opportunity for Year 7 students to take part in a range of science related activities such as making pin hole cameras.

Biology & Chemistry Society:

The Biology & Chemistry Society is held weekly and is an opportunity for students in Years 10-13 to attend (and present) talks on areas of chemistry that are of interest to them. The talks are presented by the students themselves as well as external speakers including representatives of the Royal Society of Chemistry and former students who went on to study chemistry of related courses.

Chemistry competitions

We endeavour to provide our students with the opportunity to extend themselves beyond the curriculum that they study. We enter students into a range of competitions during the year these include:

- **Top of the Bench competition**

This is an inter school competition organised by the Royal Society of Chemistry for teams of year 9,10 and 11 students.

- **Cambridge Chemistry Competition**

This competition is held at the end of year 12 and provides students with an opportunity to extend and apply their sixth form knowledge. It consists of a 2 hour written paper and students that are highly successful nationally have the opportunity to attend a summer school at the University of Cambridge.

- **International Chemistry Olympiad**

This competition is held in the spring of year 13 and again provides the opportunity for the students to extend and apply their chemistry knowledge. It consists of a challenging 3 hour written paper and students that are successful will have the opportunity to progress to later rounds which potentially lead to representing the UK in the international finals.