



## **Curriculum Overview – CHEMISTRY**

In year 9 the Chemistry curriculum is designed to bridge the gap between KS3 and GCSE. It concentrates on developing skills and instilling the basics of the subject. It is our expectation that every student should be able to write a balanced equation, that matter is made up of atoms and understand the difference between elements, compounds and mixtures. We want students to be able to relate the study of chemistry in the classroom to knowledge about the world around them. They should know why salt is put on roads in the winter, why lemonade goes flat if left in the warm sun and why granulated sugar dissolves faster than sugar cubes.

In KS4 we follow the Edexcel specification. Chemistry is a practical based subject and wherever possible we encourage students to experiment, see reactions first hand and develop into capable practitioners of the subject. Often for Chemists, our fondness for the subject literally began with a bang and our course is designed to include as many of these show stopping demonstrations as possible. By the end of the two years it is hoped that students will have learnt about the impacts of Chemistry on their everyday lives. In particular, they will know some of the science about the Earth's atmosphere and the impact that global warming will have on their lives. They will be able to approach problems logically and evaluate data scientifically and objectively.

In KS5 the ethos of the department continues – practical based, full of demonstrations and relevant to everyday life. The level of study brings interest and fascination that was previously unattainable. Topics that were studied at GCSE are revisited but with a completely different approach. For example, students will finally be able to appreciate why the elements are arranged in the way they are in the Periodic Table. In year 12 we introduce a variety of different topics which allow students to build up their knowledge above GCSE. Physical and Inorganic Chemistry topics are revisited and extended. In the Organic Chemistry strand, we begin introducing a variety of organic families such as Alkanes, Haloalkanes and Alkenes; and then expanding them over the course of the two years. Foundation Organic Chemistry is the key to ensure that once students enter Year 13 they are able to cope with a number of ideas that are more complicated and challenges such as Organic Synthesis. Students will understand how some drugs work and why some can cause horrific side effects such as thalidomide. The course goes beyond A level and students are encouraged to stretch themselves by taking part in the Chemistry Olympiad and Cambridge Chemistry Challenge. By the end of A level, our Students will have a background in Chemistry that will give them an appreciation of the world around them and for those doing a chemistry related subject or medicine, they can start their degree fully prepared for university.

### Key Stage 3

Year 7	Year 8	Year 9
n/a	n/a	State of matters
		Elements/compounds and mixtures
		Solubility and precipitation reactions
		Rate of reactions
		Practical skills
		Graph skills
		Balancing equations – writing chemical equations.
		Learn formulae for positive and negative common ions – combining these to make the formulae of ionic compounds.

## Key Stage 4 – GCSE Exam Board: Edexcel

Year 10	Year 11
Atomic structure	Rate of reactions
Bonding	Equilibrium
The periodic table	Chemical analysis – identifying ions and tests for gases
Acids and bases – making soluble and insoluble salts	Energy changes
Metals and reactivity series	Organic chemistry
Quantitative chemistry	Electrolysis
Water, air and pollution	Practical skills - practical assessment
Practical skills - practical assessment	Maths skills
Maths skills	Graph skills
Balancing equations	Balancing equations
Writing chemical and ionic equations	Writing chemical and ionic equations

## Key Stage 5 – A Level/Pre U Exam Board: AQA

Year 12		Year 13	
Inorganic/physical stand	Organic strand	Inorganic/physical stand	Organic strand
Quantitative chemistry	Atomic structure	Thermodynamics	Nomenclature and isomerism
Kinetics	Bonding and shape of molecules	Kinetics	Benzene
Halogens	Intermolecular forces	Acids and bases	Carbonyls, carboxylic acids and derivatives – preparation of aspirin
Redox	Introduction to organic chemistry- naming organic compounds	Aqueous chemistry	amines
Volumetric analysis	Alkanes	Transition metals	Spectroscopy - analytical skills: infra-red, mass spectrometry, NMR low and high resolution
Enthalpy changes	Alkenes		Electrochemistry
Equilibrium	Haloalkanes		Organic synthesis – synoptic work
Periodicity			
Maths skills	Analytic skills: Infrared and mass spectrometry	Maths skills	
Practical skills – CPAC assessment	Mechanism skills for organic reactions	Practical skills – CPAC assessment	
Writing chemical and ionic equations skills			