

Chemistry Year 12 Curriculum Overview

What is the Year 12 Chemistry curriculum aiming to achieve?

What do we want our Year 12 (Chemists) to be like?	How are we building on prior learning?	How can parents/carers support their child's learning?
<p>Be excited, enthusiastic and curious about the scientific world around us.</p> <p>To be competent and confident in a variety of practical, mathematical and problem-solving skills through Required Practicals.</p> <p>Be resilient when challenged with new and more complex ideas.</p> <p>To be well equipped and knowledgeable in a range of skills techniques and concepts in Chemistry</p> <p>Adept at processing new information and committing it to long term memory and have good recall.</p>	<ul style="list-style-type: none"> • Topics include recall of key GCSE knowledge • Atomic structure and bonding taught in years 9-11 develop directly from GCSE • Organic Chemistry taught in year 11 • Rates of reaction taught in year 11 • Periodic table structure and trends taught in years 9-10 	<ul style="list-style-type: none"> • Check their understanding of key terms • Talk to the pupils about what they are learning about in lessons

How are we organising the Year 12 Chemistry curriculum?

Teacher 1	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topics	Atoms, ions and compounds Amount of Substance	Amount of Substance Acids and Redox	PPE Enthalpy	Reaction Rates and Equilibrium	Alcohols Haloalkanes PPE	Rates of Reactions (Y13)
Threshold Concepts	The chemical properties of elements depend on their atomic structure and in particular on the arrangement of electrons around the nucleus	Chemists measure amount of substances in moles. Acidity in aqueous solutions is caused by hydrogen ions and a logarithmic scale, pH, has been devised to measure acidity. Redox reactions involve a transfer of electrons from the reducing agent to the oxidising agent.	Chemical reactions absorb or emit energy. These energy changes can be calculated.	The reactivity of chemicals is a significant factor in how fast chemical reactions proceed, there are variables that can be manipulated in order to speed them up or slow them down. Le Chatelier's principle can be used to predict the effects of changes in temperature, pressure and concentration on the yield of a reversible reaction	Alcohols have many scientific, medicinal and industrial uses. Haloalkanes have a carbon-halogen bond in their structure and are an important starting material in chemistry as they are reactive.	Rate equations give information about the mechanism of a reaction that may occur in several steps.
Skills	PAG 1 Moles Determination	PAG 2 Acid-base Titration PAG 11 pH measurement	PAG 3 Enthalpy Determination		PAG 5 Synthesis of an Organic Liquid	PAG 10 Initial Rates Method
Teacher 2	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topics	Atomic Structure & Bonding	Shapes of Molecules, Intermolecular Forces (Module 2 Test)	Periodicity, Group 7, Group 2, Analysis PPE	Basic concepts of Organic chemistry Alkanes, Alkenes	Organic Analysis PPE	Benzene (Y13)
Threshold Concepts	The arrangement of electrons in orbitals is linked	The physical and chemical properties of	The elements in Group 2 are called the alkaline	Organic compounds are named using the	Interpret graphs from mass spec and infrared spec	Describe the evidence for the

	to the way in which elements are organised in the Periodic Table.	compounds depend on the ways in which the compounds are held together by chemical bonds and by intermolecular forces.	earth metals. The trends in the solubilities of the hydroxides and the sulfates of these elements are linked to their use. The halogens in Group 7 are very reactive non-metals. Trends in their physical properties are examined and explained.	International Union of Pure and Applied Chemistry (IUPAC) system and the structure or formula of molecules can be represented in various different ways. Organic mechanisms are studied, which enable reactions to be explained.	to identify unknown organic molecules	structure of Benzene Recall and describe the reactions of Benzene
Skills			PAG 4 Qualitative analysis of ions			PAG 6 Synthesis of an Organic Solid
Enrichment within the curriculum	<p>Students have previously attended a STEM day at Birmingham university to enhance their understanding of synthesis, separation and analysis of organic compounds.</p> <p>Students will be tested in a variety of ways on their research skills (e.g. Benzene day where students must present their findings on Benzene).</p> <p>PAGs as well as other practicals will take place whenever appropriate.</p> <p>Personal Learning Checklists for each topic with a QR codes to YouTube videos for support</p> <p>Specification questions sheets for each topic</p>					
Cross curricular links	<ul style="list-style-type: none"> • Math skills – Graphing, ratios, use of formula and algebra • Physics – Ideal gas law • Biology – Polymers, hydrogen bonding, condensation polymerisation 					
Extra-curricular opportunities	<p>Chemistry staff are available for Chemistry Clinic drop in sessions. In addition nearer exams more formal revision sessions will take place.</p> <p>There has previously been opportunity to attend a variety of cutting edge research talks at Warwick University.</p>					

What are the intended outcomes of the Year 12 (Chemistry) curriculum?

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Opportunities to show progress (Assessments)	End of topic assessments	End of topic assessments and Module 2 tests	End of topic assessments	End of topic assessments	End of topic assessments PPE	End of topic assessments
Impact on personal development (SMSC)	<p><i>Rapid advances in Chemistry mean that the world and society is changing at a faster pace than ever before. Often these advancements have a positive influence, however sometimes these can cause tension within our society and moral issues can arise. Students would need to deepen their own understanding, weigh up the evidence to form independent unbiased conclusions supported with scientific facts. The developments in Chemistry are global, from the early periodic table by Russian Scientist Mendeleev, to Le Chatelier's Principle named after a French Chemist in the field of chemical equilibria. The area of Chemistry is thriving due to commitment from different cultures.</i></p>					
Preparation for the next stage of education	<p><i>The foundations taught in year 12 are fundamental for the key concepts the students will move onto in year 13. Many topics are revisited and spiralled throughout the curriculum in more depth and application.</i></p>					