

CHEMISTRY KEY STAGE 5 CURRICULUM OVERVIEW

By the end of Key Stage 5, students should:

Know	<i>By the end of the AQA A Level Chemistry course, students should know the key principles of physical, inorganic, and organic chemistry and how these areas interconnect. They should understand atomic structure, bonding, and energetics, as well as the factors that influence rates of reaction and chemical equilibrium. Students should also know how redox reactions, periodic trends, and transition metal chemistry explain many real-world chemical behaviours. In organic chemistry, they should understand the structure, properties, and reactions of key functional groups, along with the importance of analytical techniques such as infrared spectroscopy, mass spectrometry, and NMR in identifying compounds. Overall, they should have a solid theoretical and practical understanding of how chemistry explains the behaviour of matter.</i>
Do	<i>Students should be able to confidently apply their knowledge of physical, inorganic, and organic chemistry to explain and predict chemical behaviour in unfamiliar contexts. They should be able to plan, carry out, and evaluate experiments safely and accurately, using a range of practical techniques and analytical skills. Students should be skilled in performing chemical calculations, balancing equations, and interpreting data from graphs, spectra, and other sources of evidence. They should also be able to communicate their ideas clearly using correct scientific terminology and demonstrate how chemistry connects to real-world applications such as medicine, energy, and materials science.</i>
Appreciate	<i>Students should appreciate the importance of chemistry in understanding and shaping the world around them. They should recognise how chemical principles underpin everyday life — from the medicines we take and the fuels we use to the materials that build modern technology. Students should also appreciate the role of chemistry in tackling global challenges such as sustainability, climate change, and resource management. Through studying the course, they should develop an understanding of the collaborative and evolving nature of scientific research and gain a deeper respect for the precision, creativity, and problem-solving skills that chemistry requires.</i>

Curriculum coverage

	Topic	Sub topic	Coverage
Year 12	Physical Chemistry	What is the structure of an atom and how does bonding occur?	<i>Atomic structure; Bonding</i>
		What calculations can I use to analyse chemical substances?	<i>Amount of substance: Moles; Concentration; Ideal gas equation; Titration calculations; Percentage yield; Atom economy Experiment 1: Titrations</i>
		How do chemical reactions happen and what do they need to occur?	<i>Energetics; Experiment 2: Measure enthalpy change; Kinetics; Experiment 3: Rate of reaction; Chemical equilibria; Kc; Oxidation ; Reduction; Redox</i>
	Inorganic Chemistry	How to use the periodic table to explain trends in the properties of elements.	<i>Periodicity</i>
		How do trends in properties change down a group?	<i>Properties of Group 2 elements; Properties of Group 7 elements</i>
		How to test for cations and anions.	<i>Experiment 4: Identify anions and cations</i>
	Organic Chemistry	How do chemical reactions change the structure of molecules? How do molecules react based on their structure?	<i>Introduction to organic chemistry; Alkanes; Halogenoalkanes; Alkenes; Alcohols</i>
		How to purify a product after the completion of a chemical reaction.	<i>Experiment 5: Distillation of a product Organic analysis</i>
		How to identify organic compounds.	<i>Experiment 6: Testing organic compounds</i>

Curriculum Coverage continued:

	Topic	Sub Topic	Coverage
Year 13	Physical Chemistry	How do conditions affect chemical reactions?	<i>Thermodynamics; Rate equations; Equilibrium constant; K_p for homogeneous systems Experiment 7: Measure rate of reaction</i>
		What is the chemistry which underpins batteries?	<i>Electrode potentials and electrochemical cells Experiment 8: Measure cell emf c</i>
		How can we use logarithm scales?	<i>Acids and bases Experiment 9: Investigate pH change</i>
	Inorganic Chemistry	How do trends in properties change across a period?	<i>Properties of Period 3 elements and their oxides</i>
		How does the unique ability to have multiple oxidation states affect the properties and uses of transition metals?	<i>Transition metals; Reactions of ions in aqueous solution</i>
		How to use simple tests to identify and analyse substances.	<i>Experiment 11: Simple tube reactions</i>
	Organic Chemistry	How are complex molecules named and grouped?	<i>Optical isomerism; Organic synthesis</i>
		How chemical reactions change the structure of molecules. How molecules react based on their structure.	<i>Aldehydes and ketones; Carboxylic acids and derivatives; Aromatic chemistry; Amines; Polymers; Amino acids, proteins and DNA</i>
		How are organic compounds identified and quantified?	<i>Nuclear magnetic resonance spectroscopy; Chromatography Experiment 12: TLC Experiment 10a: Test organic solid aspirin Experiment 10b: Test organic liquid ethyl ethanoate</i>

Wider Key Stage 5 Curriculum

Homework expectations - Students will be set independent work that will encourage them to use their study periods wisely and practice the new skills that they need for A level. Homework tasks for KS5 science students might include researching scientific concepts, completing data analysis, answering extended-response questions, preparing practical write-ups, or revising past exam questions. Students also have access to a range of resources via Microsoft Teams.