

What are the aims and intentions of this curriculum?

The aim of our Key Stage 5 Curriculum is to promote a passion for chemistry and equip the students with the necessary skills and qualifications for the next step towards their future career. The curriculum will deliver the A level subject content through the Modules: Foundations in chemistry, Periodic table and energy and Core organic chemistry. This is a flexible approach where each module is divided into topics that cover the key concepts of chemistry. The teaching of practical skills is integrated within the theoretical topics. As well as developing strong mathematical ability, this curriculum will provide our students with invaluable and transferable skills including: analysis and problem solving, time management and organisation, as well as written and oral communication skills.

Term	Topics	Knowledge and key terms	Skills developed	Assessment
Autumn 1	<ul style="list-style-type: none"> • Atoms, ions and compounds • Amount of substance • Acids and redox • Electrons and bonding 	<p>Students will build directly from GCSE Science, starting with basic atomic structure and isotopes.</p> <p>The role of acids, bases and salts in Chemistry is developed in the context of neutralisation reactions.</p> <p>Redox reactions are studied within the context of oxidation number and electron transfer.</p> <p>The introduction of the concept of atomic orbitals and developing a deeper understanding of electron configurations linked to the periodic table.</p> <p>The central role of electrons in ionic and covalent bonding is studied.</p>	<p>Important basic chemical skills are developed: writing chemical formulae, constructing equations and calculating chemical quantities using the concepts of amount of substance.</p> <p>Other skills include the development of important quantitative techniques involved in measuring masses, gas and solution volumes, including the use of volumetric apparatus.</p>	<ul style="list-style-type: none"> • PAG 1: Moles determination • Atoms, ions and compounds assessment. • Amount of substance assessment. • Acids and redox assessment. • Electrons and bonding assessment.
Autumn 2	<ul style="list-style-type: none"> • Shapes of molecules and intermolecular forces • Periodicity • Reactivity trends • Enthalpy 	<p>The important role of molecules is studied, including an explanation of polarity and intermolecular forces. This section looks at how structure and bonding contribute to the properties of substances.</p> <p>Periodic trends are studied to extend the understanding of structure and bonding. Group properties are studied using Group 2 and the halogens as typical metal and non-metal groups, allowing an understanding of redox reactions to be developed further.</p> <p>This section looks at how unknown ionic compounds can be analysed and identified using simple test tube tests.</p> <p>Students learn about the importance of enthalpy changes, their uses and determination from experimental results including enthalpy cycles.</p>	<p>The development of important qualitative practical skills, especially observational skills required for analysis and accurate quantitative techniques involved in the determination of energy changes.</p> <p>There are opportunities for developing mathematical skills when studying enthalpy changes and when carrying out quantitative practical work.</p>	<ul style="list-style-type: none"> • PAG 2: Acid Base Titration • Shapes and intermolecular forces assessment • Periodicity assessment • Reactivity trends assessment • Enthalpy assessment • First Trial Examination

Spring 1	<ul style="list-style-type: none"> • Reaction rates and equilibrium • Basic concepts of organic chemistry • Alkanes • Alkenes 	<p>Students will learn the ways in which a change in conditions can affect the rate of a chemical reaction, in terms of activation energy, the Boltzmann distribution and catalysis.</p> <p>Reversible reactions are studied including the dynamic nature of chemical equilibrium and the influence of conditions upon the position of equilibrium.</p> <p>The integrated roles of enthalpy changes, rates, catalysis and equilibria are considered as a way of increasing yield and reducing energy demand, improving the sustainability of industrial processes. Students will be introduced to the various types of structures used routinely in organic chemistry, nomenclature, and the important concepts of homologous series, functional groups, and isomerism and reaction mechanisms.</p> <p>These initial ideas are then developed within the context of the hydrocarbons, alkanes and alkenes.</p>	<p>Quantitative techniques and mathematical skills are further developed in the determination of reaction rates.</p> <p>The development of important organic practical skills, including the use of Quickfit apparatus for distillation and heating under reflux.</p>	<ul style="list-style-type: none"> • PAG 3: Enthalpy Determination • PAG 4: Qualitative Analysis of Ions • Reaction rates and equilibrium assessment • Basic concepts of organic chemistry assessment • Alkanes assessment • Alkenes assessment
Spring 2	<ul style="list-style-type: none"> • Alcohols • Haloalkanes • Organic synthesis • Spectroscopy 	<p>This section introduces two further functional groups: alcohols and haloalkanes, and considers the importance of polarity and bond enthalpy to organic reactions.</p> <p>Students will learn the important techniques of infrared spectroscopy and mass spectrometry to illustrate instrumental analysis as a valuable tool for identifying organic compounds.</p>	<p>The development of organic practical skills, including the preparation and purification of organic liquids.</p> <p>The development of analytical skills from the use of mass and infrared spectra.</p>	<ul style="list-style-type: none"> • PAG 5: Synthesis of an Organic Liquid • Alcohols assessment • Haloalkanes assessment • Organic synthesis assessment • Spectroscopy assessment • Second Trial Examination
Summer 1	<ul style="list-style-type: none"> • Revision 	<p>The consolidation and practice of the subject content contained in the AS modules: Foundations in chemistry, Periodic table and energy and Core organic chemistry, through revision lessons, completing past paper questions, timed questions, student presentations and online quizzes.</p>	<p>The consolidation of mathematical skills, practical skills and analytical skills acquired through the year.</p>	
Summer 2	<ul style="list-style-type: none"> • Examinations • Rates of reactions 	<p>Students will build on their knowledge and understanding of the chemical concepts that were developed in AS Chemistry.</p> <p>The largely qualitative treatment of reaction rates encountered in AS Chemistry is further developed within a quantitative and graphical content.</p> <p>This section also allows students to develop practical quantitative techniques involved in the determination of reaction rates.</p>	<p>The development of mathematical skills, including the use of logarithms and exponents when studying the content and when carrying out quantitative practical work.</p>	<ul style="list-style-type: none"> • Rates of reactions assessment.