



**Curriculum Overview for:
Chemistry**

**Key Stage 4
Academic Year Group: 12**

Term	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic	Foundations in Chemistry – Atoms and reactions	Foundations in Chemistry – Electrons, bonding and structure	The Periodic Table	Basic concepts of organic Chemistry	Physical Chemistry	Alcohols, Haloalkanes and analysis
Content	<ul style="list-style-type: none"> Atomic structure and isotopes Compounds, formulae and equations Amount of substance Acids Redox 	<ul style="list-style-type: none"> Electron structure Structure and bonding 	<ul style="list-style-type: none"> Periodicity Group 2 The halogens Qualitative analysis 	<ul style="list-style-type: none"> Basic concepts of organic chemistry Alkanes Alkenes 	<ul style="list-style-type: none"> Enthalpy changes Reaction rates Chemical equilibrium 	<ul style="list-style-type: none"> Alcohols Haloalkanes Organic synthesis Analytical techniques
Rationale/ Linking	<p>The course starts with the foundations of chemistry that bridges the gap between GCSE and A level Chemistry. This topic builds on the skills learnt at GCSE and provides the key knowledge and skills to be applied in every future topics of the A level course.</p> <p>These two sections of foundation chemistry are taught side by side by parallel teachers.</p>		<p>Topics above are taught in parallel by specialist teachers. Students develop their understanding of the periodic table and it's trends. They will later use this information to explain reactivity and reactions in many different scenarios and make predictions. Eg – trends down group 7 and qualitative analysis will be used in the summer term when studying the hydrolysis of haloalkanes.</p> <p>In organic chemistry students learn the rules of nomenclature, the properties and reactions of alkanes and alkenes. Reaction mechanisms are also introduced at this stage.</p>		<p>Topics above are taught in parallel by specialist teachers. In the physical chemistry topic students spiral back to use the mathematical skills developed in the Autumn term. Additionally they build on the work done at GCSE with rates, equilibrium and energy changes. These concepts will all go on to be built on with further layers of complexity in Y13.</p> <p>In the organic unit students develop their use of reaction mechanisms further. Students are also given the opportunity to learn new practical techniques such as heating under reflux.</p> <p>Finally students begin learning about analytical techniques, problem solving skills that will be built upon during Y13 a prepare students for further education in chemistry.</p>	
Assessment	<p>Regular end of topic assessments at least once per half term. Regular informal assessment opportunities built into lessons and homework.</p> <p>Y12 Trial exams in the summer term.</p>			Learning Resources	<p>OCR A level Chemistry textbook and CPG revision guide. Practical resources for PAG activities.</p>	



Term	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Topic	Rates, equilibrium pH	Aromatic compounds, carbonyls and acids	Energy, Transition elements, redox and electrochemistry	Organic Chemistry 2 - Nitrogen compounds, polymers, synthesis and analysis	Revision and Past Paper Practice	N/A
Content	Rate equations, orders of reaction, the rate-determining step Equilibrium constants, K_c and K_p Acid-base equilibria including pH, K_a and buffer solutions	Aromatic compounds Carbonyl compounds Carboxylic acids and esters	Lattice enthalpy and Born-Haber cycles Entropy and free energy Electrochemical cells Redox chemistry Transition elements.	Amines Amino acids, amides and chirality Polyesters and polyamides Carbon-carbon bond formation Organic synthesis Chromatography and qualitative analysis Spectroscopy	Revision of topics and practice of past exam papers as exam preparation.	N/A
Rationale/ Linking	Topics above are taught in parallel by specialist teachers. Students use the concepts learnt in physical chemistry during Y12. Developing further quantitative skills and using higher mathematical skills to analyse data from chemical reactions. The organic chemistry unit continues to broaden exposure to more organic compounds, including some met at GCSE (carboxylic acids and esters, and some that have never been met before such as aromatic compounds.		Topics above are taught in parallel by specialist teachers. Students continue to build on physical chemistry from Y12 while introducing new concepts of entropy. The understanding of entropy then allows students to make predictions for feasibility which is revisited when studying electrochemical cells. Students use the redox reaction in electrochemical cells and combine this knowledge with quantitative topics from the beginning of Y12 to determine quantities of transition metals in redox titrations. Finally transition metals and ligands link closely to aspects of A level biology with haemoglobin being used a specific example of multidentate ligands. The organic chemistry topic is rounded off with the final group of organic compounds and their reactions. Finally students develop the analytical skills from Y12 with new techniques such as nmr to be able to combine a range of techniques for the identification of unknowns.			N/A
Assessment	Regular end of topic assessments at least once per half term. Regular informal assessment opportunities built into lessons and homework. Y13 Trial exams in the autumn term. External exams in the summer term.			Learning Resources	OCR A level Chemistry textbook and CPG revision guide. Practical resources for PAG activities.	