

Year 12 Chemistry classes are taught by 1 Chemistry specialist teacher. Topics are divided to provide a logical order of delivery and to support each other. Core Practicals are delivered within the relevant topics to enhance knowledge, understanding and investigative skills and also provide evidence for the Practical Endorsement qualification. Mathematical skills are developed within topics also. Many topics in year 12 build upon foundation skills/knowledge from KS4 topics (in red).

Year 12	Chemistry Course Outline					
	Autumn		Spring		Summer	
	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
	Knowledge	<ul style="list-style-type: none"><li>• <b>Topic 1: Atomic Structure and the Periodic Table</b><sup>3/4</sup> Explain atomic structure and trends in the Periodic Table</li><li>• <b>Topic 2: Bonding and Structure</b><sup>5/6/7</sup> Explain the structure and bonding in Ionic, Covalent &amp; Metallic substances</li></ul>	<ul style="list-style-type: none"><li>• <b>Topic 3: Redox I</b><sup>11</sup> Write and explain balanced equations for Redox reactions</li><li>• <b>Topic 4: Inorganic Chemistry and the Periodic Table</b><sup>17</sup> Properties and Reactions of Group 1, 2 &amp; 7 elements</li></ul>	<ul style="list-style-type: none"><li>• <b>Topic 5: Formulae, Equations and Amounts of Substance</b><sup>9/14</sup> Calculating Moles, Yields, Atom Economy, Concentration, Titrations, Gas Volumes &amp; Empirical Formula</li></ul>	<ul style="list-style-type: none"><li>• <b>Topic 6: Organic Chemistry I</b><sup>20/22</sup> Structure &amp; properties of different Organic compounds. Explaining mechanisms of different Organic reactions. Drawing Isomers of Organic compounds Explain Polymerisation</li><li>• <b>Topic 7: Modern Analytical Techniques I</b><sup>N/A</sup> Explain/interpret modern analytical techniques of Mass and IR Spectroscopy</li></ul>	<ul style="list-style-type: none"><li>• <b>Topic 8: Energetics I</b> Explain and calculate enthalpy changes of Exo/Endothermic reactions<sup>19</sup></li><li>• <b>Topic 9: Kinetics I</b><sup>18</sup> Calculate rates of reaction. Explain factors that affect rate of reactions.</li></ul>
Skills	<p><b>Maths</b> Calculate Isotopic abundance using mass Spectra. Calculating electronegativity using Pauling Scale.</p> <p><b>Practical</b> Flame tests</p>	<p><b>Maths</b> Balancing charges of Redox reactions.</p> <p><b>Practical</b> Chemical reactions of Group 1&amp;2 metals. Halogen displacement reactions. Testing for Halide ions.</p>	<p><b>Maths</b> Using equations/formulas to calculate above. Transposing equations to make unknown the subject of the equation.</p> <p><b>Practical</b> Carry out Acid/Base titrations. Finding Molar Volume of a gas. Testing for Cations/Anions. <b>[CPAC 1, 2, 3]</b></p>	<p><b>Maths</b> Write balanced symbol equations. Draw structural formula of Isomers.</p> <p><b>Practical</b> Testing for Organic functional groups. Carry out different types of Organic reactions. Preparation of Halogenoalkanes. Reactions of alcohols. <b>[CPAC 4, 5, 6, 7]</b></p>	<p><b>Maths</b> Use of equations for calculating enthalpy changes. Determining gradients of graphs to calculate rates of reaction. Calculating ratios. Interpreting distribution curves.</p> <p><b>Practical</b> Measuring enthalpy changes of exo/endothermic reactions. Calculating rate of chemical reactions – disappearing cross expt. <b>[CPAC 8]</b></p>	<p><b>Maths</b> Constructing Equilibrium Constant equations.</p> <p><b>Practical</b> None</p>
Assessment	1 ILT (in Year 12 booklet) and 1 end of topic test per topic	1 ILT (in Year 12 booklet) and 1 end of topic test per topic	1 ILT (in Year 12 booklet) and 1 end of topic test per topic	1 ILT (in Year 12 booklet) and 1 end of topic test per topic	1 ILT (in Year 12 booklet) and 1 end of topic test per topic	1 ILT (in Year 12 booklet) and 1 end of topic test per topic
Assessment						

		Autumn		Spring		Summer	
		Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 13	Knowledge	<ul style="list-style-type: none"> <li>• <b>Topic 11: Equilibrium II</b> <sup>10</sup> – Calculating equilibrium quantities</li> <li>• <b>Topic 12: Acid-base Equilibria</b> <sup>5</sup> – different theories of acids, Calculating the pH from concentration data and reverse in a variety of situations</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Topic 13: Energetics II</b> <sup>8</sup> – Lattice enthalpies using born haber cycles &amp; enthalpies of solution, entropy &amp; free energy</li> <li>• <b>Topic 16: Kinetics II</b> <sup>9</sup> – Rate and order of reaction</li> <li>• <b>Topic 15: Transition Metals</b> <sup>4</sup> – variable oxidation states and reactions of transition metals</li> <li>• <b>Topic 14: Redox II</b> <sup>3</sup> – electrode potentials in electrochemical cells</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Topic 17: Organic Chemistry II</b> <sup>6</sup> – chirality of molecules, carbonyl compounds, reaction mechanisms, shape of molecules and implications</li> <li>• <b>Topic 18: Organic Chemistry III</b> <sup>6</sup> – arenes, amines, amino acids and proteins and organic synthesis, synthetic pathways to make useful molecules from various starting point.</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Topic 19: Modern Analytical Techniques II</b> <sup>7</sup> – MS, NMR (carbon and proton) and chromatography</li> </ul>	Exam preparation	
	Skills	<p><b>Maths</b> - use of common logs, constructing expressions for K<sub>c</sub> and K<sub>p</sub>, calculating values with relevant units &amp; estimating the change to the value of an equilibrium constant</p> <p><b>Practical</b> – determination of pK<sub>a</sub>, use of pH probes &amp; data loggers</p> <p><b>[CPAC 9]</b></p>	<p><b>Maths</b> - use of natural logs to calculate Gibbs free energy, using algebraic expressions constructing BH cycles, graphical skills rearranging expressions to y=mx+c</p> <p><b>Practical</b> – determine activation energies, orders of reaction</p> <p><b>[CPAC 10, 11, 12,13, 14]</b></p>	<p><b>Maths</b> - calculating R<sub>f</sub> values, interpreting a variety of different spectra, calculating relative molecular masses, using the (n+1) rule for proton NMR.</p> <p><b>Practical</b> – use of wet chemical methods to identify unknowns, chromatography, synthesis molecules</p> <p><b>[CPAC 16]</b></p>	<p><b>Maths</b> - calculating R<sub>f</sub> values, interpreting a variety of different spectra, calculating relative molecular masses, using the (n+1) rule for proton NMR.</p> <p><b>Practical</b> – use of wet chemical methods to identify unknowns, chromatography, synthesis molecules</p> <p><b>[CPAC 15]</b></p>	Revision	
	Assessment	1 ILT (in Year 13 booklet) and 1 end of topic test per topic	1 ILT (in Year 13 booklet) and 1 end of topic test per topic	1 ILT (in Year 13 booklet) and 1 end of topic test per topic			

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