

# Curriculum Map Year 11 Separate Science - Chemistry

Topic Name	Term	Skills developed with link to NC Subject content	Reflection on previous link in the curriculum	Progress to future link in the curriculum
Organic Chemistry	Autumn HT1	<ul style="list-style-type: none"> <li>Crude oil, hydrocarbons and alkanes</li> <li>Fractional distillation and petrochemicals</li> <li>Properties of hydrocarbons</li> <li>Cracking and alkenes</li> <li>Structure and formulae of alkenes</li> <li>Reactions of alkenes</li> <li>Alcohols</li> <li>Carboxylic acids</li> <li>Addition polymerisation</li> <li>Condensation polymerisation (HT only)</li> <li>Amino acids (HT only)</li> <li>DNA (deoxyribonucleic acid) and other naturally occurring polymers</li> </ul>	<p><b>Year 7:</b> Separating Mixtures</p> <ul style="list-style-type: none"> <li>condensation</li> <li>evaporation</li> <li>Simple distillation of inky water</li> </ul> <p><b>GCSE</b> Covalent bonding and properties of simple covalent molecules</p> <ul style="list-style-type: none"> <li>This content allows pupils to make the link between molecule size and boiling point due to relative strength of intermolecular forces.</li> </ul>	<p><b>A Level</b> Organic Chemistry</p> <ul style="list-style-type: none"> <li>Nomenclature</li> <li>Synthesis</li> <li>Reaction conditions</li> <li>Biochemistry</li> <li>Esters</li> <li>Acylation</li> <li>Polymers</li> </ul>
Rate of Reaction and Extent of Chemical Change	Autumn HT2	<ul style="list-style-type: none"> <li>Calculating rates of reactions</li> <li>Factors which affect the rates of chemical reactions</li> <li>Collision theory and activation energy</li> <li>Catalysts</li> <li>Reversible reactions</li> <li>Energy changes and reversible reactions</li> <li>Equilibrium</li> <li>The effect of changing conditions on equilibrium (HT only)</li> <li>The effect of changing concentration (HT only)</li> <li>The effect of temperature changes on equilibrium (HT only)</li> <li>The effect of pressure changes on equilibrium (HT only)</li> </ul>	<p><b>Year 7:</b> Rates of Reaction practical</p> <ul style="list-style-type: none"> <li>Students investigate the surface area of Jelly babies and time taken to dissolve in water.</li> <li>A graph is plotted</li> <li>Particle theory and collisions between water and Jelly baby particles are discussed.</li> </ul>	<p><b>A Level</b></p> <ul style="list-style-type: none"> <li>Kinetics and Rate Equations</li> <li>Le Chatelier's Principle</li> <li>Maxwell Boltzmann Distributions</li> <li>Reaction Orders</li> </ul>
Chemical Analysis	Spring HT3	<ul style="list-style-type: none"> <li>Pure substances</li> <li>Formulations</li> <li>Chromatography</li> <li>Identification of common gases</li> <li>Identification of ions by chemical and spectroscopic means (chemistry only)               <ul style="list-style-type: none"> <li>flame tests</li> <li>metal hydroxides</li> <li>carbonates</li> <li>halides</li> <li>sulfates</li> <li>flame emission spectroscopy</li> <li>benefits and disadvantages of instrumental methods of identification</li> </ul> </li> </ul>	<p><b>Year 7</b> Solubility Chromatography</p> <ul style="list-style-type: none"> <li>Simple paper chromatography of pen ink introduces students to R<sub>f</sub> values and the relationship between solubility and distance travelled in solvent.</li> </ul> <p><b>Year 8</b> Reactions of Metals with acids and metal carbonates with acid</p> <ul style="list-style-type: none"> <li>Test for hydrogen</li> <li>Test for carbon dioxide</li> </ul>	<p><b>A Level</b> Chemical Analysis</p> <ul style="list-style-type: none"> <li>NMR</li> <li>IR</li> <li>TOF Mass Spectrometry</li> <li>Ion Tests</li> <li>GC</li> <li>Flame Emission</li> <li>Column Chromatography</li> <li>TLC</li> </ul> <p><b>Group 2</b></p> <ul style="list-style-type: none"> <li>Barium Chloride test for sulfate</li> </ul> <p><b>Group 7</b></p> <ul style="list-style-type: none"> <li>Testing for halide ions</li> </ul>

Atmospheric Chemistry and Using Resources	Spring HT4	<ul style="list-style-type: none"> <li>• The proportions of different gases in the atmosphere</li> <li>• The Earth's early atmosphere</li> <li>• How oxygen increased</li> <li>• How carbon dioxide decreased</li> <li>• Greenhouse gases</li> <li>• Human activities which contribute to an increase in greenhouse gases in the atmosphere</li> <li>• Global climate change</li> <li>• The carbon footprint and its reduction</li> <li>• Atmospheric pollutants from fuels</li> <li>• Properties and effects of atmospheric pollutants</li> <li>• Using the Earth's resources and sustainable development</li> <li>• Potable water</li> <li>• wastewater treatment</li> <li>• Alternative methods of extracting metals (HT only)</li> <li>• Life cycle assessment</li> <li>• Ways of reducing the use of resources</li> <li>• Corrosion and its prevention</li> <li>• Alloys as useful materials</li> <li>• Ceramics, polymers and composites</li> <li>• The Haber process</li> <li>• Production and uses of NPK fertilisers</li> </ul>	<p><b>Year 8:</b> Fuels</p> <ul style="list-style-type: none"> <li>• complete and incomplete combustion</li> </ul> <p><b>Year 8:</b> Climate Change</p> <ul style="list-style-type: none"> <li>• global warming</li> <li>• acid rain</li> </ul> <p><b>Year 8:</b> Sustainability</p> <ul style="list-style-type: none"> <li>• Recycling</li> <li>• Life Cycle assessments</li> <li>• Impact of metal extraction</li> </ul>	<p><b>A Level</b></p> <p>Organic Chemistry</p> <ul style="list-style-type: none"> <li>• Free Radical Chemistry</li> <li>• Atmospheric Pollutants</li> <li>• Polymer disposal</li> <li>• Choosing Suitable Reagents</li> </ul>
Preparation for Examinations	Summer HT5			