

## Curriculum Map: Year 11 Chemistry

	Half Term 1 and 2	Half Term 3	Half term 4	Half Term 5 and 6
<b>Topic</b>	<b>The rate and extent of chemical change</b>	<b>Organic chemistry and **chemical analysis</b>	<b>Using resources</b>	<b>Revision and preparation for exams</b>
<b>Intent</b>	<p>Students will learn:</p> <p>That the rate of reaction can vary depending on the reactivity of a chemical.</p> <p>The rate of reaction can be influenced by changing factors.</p> <p>How the collision theory and activation energy helps scientists understand more about controlling the rate of a reaction.</p> <p>How to use formulae, data and graphs to determine the rate of reaction.</p> <p>Some reactions are reversible.</p> <p>Equilibria occurs when the forward and reverse reactions happen at the same rate.</p> <p>Equilibrium can be affected by changing factors.</p>	<p>Students will learn:</p> <p>About carbon compounds as fuel and feedstock.</p> <p>The composition and evolution of the Earth's atmosphere.</p> <p>About greenhouse gases and the impact of human activity.</p> <p>**Students will have improved their investigative SKILLS by identifying simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography, The identification of pure substances.</p>	<p>Students will learn:</p> <p>How water is made safe to drink.</p> <p>Wastewater management.</p> <p>Life cycle assessment and recycling.</p>	<p>Students will:</p> <p>Consolidate learning from year 9, 10 and 11.</p> <p>Prepare for paper 1 and 2.</p>
<b>Key Knowledge</b>	<p>Reactions can only occur when particles collide with sufficient energy (activation energy).</p> <p>The rate of a reaction can be changed by changing the temperature, concentration, pressure, surface area of the reactants or by adding a catalyst.</p> <p>The rate of reaction can be calculated using a formula or from a graph.</p>	<p>Crude oil is a finite resource found in rocks made from plankton a long time ago.</p> <p>Crude oil is a mixture of hydrocarbons (alkanes) and can be separated into useful fractions using fractional distillation.</p> <p>Fuels (fossil fuels) such as petrol and diesel are some of the useful fractions in crude oil.</p> <p>Some hydrocarbons from crude oil can be broken down further and turned into plastics.</p> <p>The atmosphere has changed since the formation of the Earth.</p>	<p>Water that is safe to drink must have low levels of dissolved salts and microbes.</p> <p>A suitable source of fresh water must first be passed through filter beds and then sterilised.</p> <p>If supplies of fresh water are limited, desalination of salty water or sea water may be required.</p> <p>Desalination can be done by distillation or by processes that use membranes such as reverse osmosis. These</p>	<p>GCSE Chemistry from year 9 – 11.</p>

	<p>In reversible reactions, reactants form products and products can form reactants.</p> <p>Equilibria occurs when the forward and reverse reactions happen at the same rate.</p> <p>Equilibrium can be affected by changing factors such as temperature, pressure and concentration.</p>	<p>Due to volcanic activity, carbon dioxide was the main gas in the atmosphere billions of years ago. Over time the levels of carbon dioxide declined, and oxygen increased.</p> <p>This is due to carbon dioxide dissolving in oceans and forming sedimentary rocks and the evolution of plants that converted carbon dioxide into oxygen.</p> <p>Humans now burn fossil fuels that increases levels of carbon dioxide in the atmosphere. Carbon dioxide is a greenhouse gas that has an impact on global climate change.</p> <p>-**Recall the tests for gases. To apply and explain the principles of chromatography. To identify the properties of pure and impure substances. To recall the definition of a formulation.</p>	<p>processes require large amounts of energy.</p> <p>Sewage and agricultural wastewater require removal of organic matter and harmful microbes.</p> <p>Sewage treatment includes screening and grit removal, sedimentation to produce sewage sludge and anaerobic digestion of sewage sludge.</p> <p>Life cycle assessments (LCAs) are carried out to assess the environmental impact of products in each of these stages:</p> <ul style="list-style-type: none"> <li>• extracting and processing raw materials</li> <li>• manufacturing and packaging</li> <li>• use and operation during its lifetime</li> <li>• disposal at the end of its useful life, including transport and distribution at each stage.</li> </ul>	
<b>Key Skills</b>	<p>Maths</p> <p>Analysis</p> <p>Recall</p> <p>Comparative reasoning</p> <p>Interpreting data from tables and graphs</p> <p>Drawing graphs using data</p> <p>Practical</p> <p>Problem solving</p> <p>Use of scientific vocabulary</p> <p>Making accurate observations</p>	<p>Analysis</p> <p>Evaluate evidence</p> <p>Comparative reasoning</p> <p>Recall</p> <p>Maths</p> <p>Interpreting data from tables and graphs</p> <p>Use of scientific vocabulary</p> <p>**C8- Chemical Analysis-</p> <p><b>Mathematical Skills</b> -use of ratio's, fractions, decimals and significant figures in calculations for chromatography.</p> <p><b>Practical Skills</b> -All pupils to execute and recall the practical 'Chromatography'. Higher set pupils to perform the practical 'identification of ions in compounds'.</p>	<p>Analysis</p> <p>Evaluate evidence</p> <p>Comparative reasoning</p> <p>Recall</p> <p>Maths</p> <p>Interpreting data from tables and graphs</p> <p>Use of scientific vocabulary</p> <p>Problem solving</p> <p>Use of scientific vocabulary</p> <p>Making accurate observations</p>	<p>Analysis</p> <p>Recall</p> <p>Interpreting data from tables and graphs</p> <p>Use of scientific vocabulary</p>
<b>Key Vocabulary</b>	<p>Particle, collide, activation energy, reactant, product, temperature,</p>	<p>Crude oil, finite, fossil fuel, hydrocarbon, alkane, methane, ethane, propane, butane, alkene,</p>	<p>Finite, potable water, fresh water, salty water, sterilisation, chlorine, ozone,</p>	

	concentration, pressure, surface area, catalyst, equilibrium, rate of reaction, reversible.	polymer, plastic, fraction, fractional distillation, volcanic activity, plankton, carbonates, sedimentary rocks, combustion, greenhouse gas, global warming, acid rain **Formulation Distillation Condensing Rf value Flame Test Mobile Phase Stationary Phase	ultraviolet light, desalination, distillation, reverse osmosis, agricultural waste, organic matter, sedimentation, sewage, raw materials.	
<b>Key Reading</b>	BBC Bitesize CGP revision guide Knowledge Organisers	BBC Bitesize CGP revision guide Knowledge Organisers	BBC Bitesize CGP revision guide Knowledge Organisers	BBC Bitesize CGP revision guide
<b>End Point</b>	Students are competent in answering structured and longer response exam style questions. Students are competent in answering maths, data and graph-based questions. Able to structure comparative sentences. Can recall practical methods. Students can plot and analyse line graphs. Draw tangents to calculate means.	Students are competent in answering structured and longer response exam style questions. Students are competent in answering maths, data and graph-based questions. Students can plot and analyse line graphs. Can recall practical methods.	Students are competent in answering structured and longer response exam style questions. Students are competent in answering maths, data and graph-based questions. Can recall practical methods. Evaluate scientific data.	Students are competent in answering structured and longer response exam style questions. Students are competent in answering maths, data and graph-based questions. Able to structure comparative sentences. Can recall practical methods. Students can plot and analyse line graphs.
<b>Form of Assessment</b>	Exam ready questions DC1 Paper 1 Mock Exams	Exam ready questions	Exam ready questions Paper 2 mock/DC2	Exam ready questions
<b>Enrichment Opportunities</b>	Use of outdoor classroom As Universities start to offer science-based workshops again Y11 will be given the opportunity to take part in trips to local universities to gain insights into scientific courses and careers.			
<b>Leadership Opportunities</b>	Chances to formally present within lessons and take ownership of that process. Student examples to demonstrate good quality work. Group work.			



**AMBITION**



**RESILIENCE**



**COURTESY**



**KINDNESS**