

## Curriculum Plans: Year   11   (Chemistry)

	Topic	Knowledge: By the end of the unit students will know:	Skills: What skills will students have developed by the end of this unit?	Key terms: What new key terms and vocabulary will be learnt in this unit?	Summative Assessment: How will pupils be assessed in this unit?
Michaelmas 1	4.6 Equilibria 4.7 Organic Chemistry	<ul style="list-style-type: none"> <li>- The concept of reversible reactions where products can react to form original reactants.</li> <li>- How energy is conserved in reversible reactions, with one direction being exothermic and the reverse endothermic.</li> <li>- The principle of dynamic equilibrium when reactions occur in closed systems, and how equilibrium is reached when forward and reverse reactions occur at the same rate .</li> </ul>	<ul style="list-style-type: none"> <li>- Applying Le Chatelier’s Principle to predict the effect of changing conditions (temperature, pressure, and concentration) on the position of equilibrium.</li> <li>- Interpreting data to predict how changes in concentration and temperature affect equilibrium .</li> </ul>	<p><b>equilibrium:</b> <i>In chemical reactions, a situation where the forward and backward reactions happen at the same rate, and the concentrations of the substances stay the same.</i></p> <p><b>equilibrium position:</b> <i>A measure of the relative concentrations of substances in an equilibrium, showing if there are more reactants or products at equilibrium.</i></p> <p><b>reversible reaction:</b> <i>A chemical reaction which can go both ways.</i></p> <p><b>Le Chatelier’s Principle:</b> <i>“if a system is at equilibrium and a change is made to any of the conditions, then the system responds to counteract that change.”</i></p> <p><b>Exothermic:</b> <i>Reaction in which energy is given out to the surroundings. The surroundings then have more energy than they started with so the temperature increases</i></p> <p><b>Endothermic:</b> <i>Reaction in which energy is taken in. The surroundings then have less energy so the temperature decreases</i></p>	End of topic test / Mock Exam
Michaelmas 2	4.8 Chemical Analysis	<ul style="list-style-type: none"> <li>- The concept of purity and how to distinguish pure substances from mixtures using melting and boiling points.</li> </ul>	<ul style="list-style-type: none"> <li>- Applying chromatographic techniques to separate mixtures.</li> <li>- Interpreting</li> </ul>	<p><b>Pure substance:</b><i>A single element or compound not mixed with any other substance.</i></p> <p><b>Formulation:</b> <i>A mixture that has been designed as a useful product. Many formulations are complex</i></p>	
Lent 1					End of topic test / Mock Exam

## Curriculum Plans: Year   11   (Chemistry)

		<p>- <b>The process and purpose of chromatography in separating mixtures.</b></p> <p>- <b>Common tests for gases such as hydrogen, oxygen, carbon dioxide, and chlorine.</b></p> <p>- <b>The identification of ions by chemical means, including flame tests and the use of sodium hydroxide.</b></p>	<p>chromatograms to determine R<sub>f</sub> values and identify compounds.</p> <p>- Carrying out chemical tests to identify gases and ions.</p> <p>- Evaluating the effectiveness of different analytical techniques, including instrumental methods.</p>	<p><i>mixtures in which each chemical has a particular purpose.</i></p> <p><b>Pure:</b> <i>A substance that has nothing added to it.</i></p> <p><b>Chromatography:</b> <i>A technique used to separate mixtures.</i></p> <p><b>Stationary phase:</b> <i>The material the sample travels on but which doesn't move itself e.g. paper</i></p> <p><b>Mobile phase:</b> <i>The solvent which moves the sample. The more soluble the sample is in the solvent, the further it moves.</i></p> <p><b>Solvent front:</b> <i>The maximum point on the chromatography paper that the mobile phase reaches – usually marked on afterwards using a pencil.</i></p> <p><b>Retention Factor:</b> <i>The ratio of how far a substance moves compared to the distance to the solvent front. For the same substance this number will always be the same.</i></p> <p><b>Cation:</b> <i>A positively charged ion</i></p> <p><b>Anion:</b> <i>A negatively charged ion</i></p> <p><b>Instrumental method:</b> <i>Elements and compounds can be detected and identified using instrumental methods. Advantages of using an instrumental technique rather than a chemical test: its quicker, more sensitive and more accurate.</i></p> <p><b>Flame Test:</b> <i>A simple test to identify cations based on the colour that a compound causes in a Bunsen flame</i></p> <p><b>Precipitate:</b> <i>A solid formed when two liquids are mixed</i></p> <p><b>Flame spectroscopy:</b> <i>An instrumental method that can identify ions</i></p>	
--	--	---	---	---	--

**Curriculum Plans: Year \_\_11\_\_ (Chemistry)**

Lent 2	4.10 Using Resources	<ul style="list-style-type: none"> <li>- <b>How Earth’s resources can be used sustainably, including potable water production and waste water treatment.</b></li> <li>- <b>The processes for extracting metals, including new methods like phytomining and bioleaching.</b></li> <li>- <b>The concept of Life Cycle Assessments (LCAs) to evaluate environmental impact.</b></li> <li>- <b>The importance of reducing the use of limited resources through reuse and recycling</b>End f topic test</li> </ul>	<ul style="list-style-type: none"> <li>- Evaluating ways to use Earth’s resources sustainably.</li> <li>- Interpreting and comparing Life Cycle Assessments of products, including assessing impacts of extraction, use, and disposal.</li> <li>- Applying knowledge of water treatment processes in practical investigations.</li> <li>- Assessing alternative methods for extracting metals</li> </ul>	<p><b>Corrosion:</b> <i>When a metal is destroyed by chemical reactions with other substances in the environment</i></p> <p><b>Alloy:</b> <i>A mixture of two or more metal elements – usually harder or stronger than the elements on their own</i></p> <p><b>Composite:</b> <i>consists of two or more materials with different properties. They are combined to produce a material with improved properties.</i></p> <p><b>Ceramic:</b> <i>Made from wet clay which is shaped and then heated in a furnace</i></p> <p><b>Polymer:</b> <i>Made from many monomers joined together to form a long chain</i></p> <p><b>Thermosoftening:</b> <i>Polymer that melts when heated</i></p> <p><b>Thermosetting:</b> <i>Polymer that does not melt when heated. These will char or burn instead due to the strong crosslinks</i></p> <p><b>Haber process:</b> <i>Process used for the manufacture of ammonia</i></p> <p><b>Ammonia:</b> <i>Compound formed from nitrogen and hydrogen with the formula NH<sub>3</sub></i></p> <p><b>Electroplating:</b> <i>Using electrolysis to coat a very thin layer of metal over another less expensive metal</i></p> <p><b>Sacrificial protection:</b> <i>Process where a more reactive metal is used to protect another metal. The more reactive metal will be used up</i></p> <p><b>Galvanising:</b> <i>Coating a metal with zinc in order to protect it.</i></p> <p><b>Haber process:</b> <i>Process used for the manufacture of ammonia</i></p>	

**Curriculum Plans: Year \_\_11\_\_ (Chemistry)**

				<p><b>Ammonia:</b>Compound formed from nitrogen and hydrogen with the formula <math>NH_3</math></p> <p><b>Fertiliser:</b>Use to improve the growth and yield of crops</p> <p><b>NPK Fertiliser:</b>Fertilisers that contain the key elements – Nitrogen, Phosphorous and Potassium</p> <p><b>Formulation:</b>A mixture of substances where each substance is present in a precisely defined amount</p>	
Trinity 1					
Trinity 2					