

## Chemistry Year 10 Curriculum End Points and key vocabulary

	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
<b>Unit of Work</b>	Bonding, Structure and the Properties of Matter	Quantitative Chemistry	Chemical Changes		Chemical Analysis	Energy Changes
<b>Ethos links</b>	<b>STEM</b> - how materials behave, uses of polymers, what causes the properties of a substance (melting point, conductivity etc), uses and applications of nanotechnology <b>Sust.</b> – Environmental implications of nanotechnology	STEM - Calculations	<b>STEM</b> – extracting metals for use. <b>Sust.</b> – Using resources from the Earth sustainably.		<b>STEM</b> – using instrumental methods to identify compounds in drugs testing etc. design of formulations for a purpose	<b>STEM</b> – What is happening in a chemical reaction. <b>Sust.</b> Using hydrogen fuel cells
<b>Knowledge</b>	By the end of this unit students will know and understand: <ul style="list-style-type: none"> <li>- How atoms form chemical bonds through transfer or sharing of electrons</li> <li>- How ionic, covalent and metallic bonds are formed</li> <li>- The properties of ionic compounds and how these relate to the structure</li> <li>- The properties of solids, liquids and gases and how these relate to the strength of forces between the particles of the substance</li> <li>- How to use state symbols in an equation</li> <li>- The properties of simple covalent structures and how these relate to the structure</li> <li>- How polymers are formed and how their structure is represented by a diagram</li> <li>- The properties of diamond, graphite and silicon dioxide, and how these relate to their structure</li> <li>- The properties of metals and alloys and how these relate to their structure</li> <li>- The properties and uses of graphene and fullerenes, and</li> </ul>	By the end of this unit students will know and understand: <ul style="list-style-type: none"> <li>- The conservation of mass</li> <li>- Relative formula mass and how to calculate percent by mass</li> <li>- Why reactions might appear to involve a change in mass</li> <li>- What is meant by a mole and how this relates to atoms, molecules, ions, compounds and equations (HT)</li> <li>- What is represented in a balanced symbol equation (HT)</li> <li>- How the amount of reactant/product in a reaction is calculated (HT)</li> <li>- What is meant by limiting reactant and why they are used</li> <li>- What is meant by concentration</li> <li>- What is meant by % yield, how to calculate it and why 100% yield isn't always obtained (triple only)</li> <li>- What is meant by atom economy and how to calculate it (triple only)</li> </ul>	By the end of this unit students will know and understand: <ul style="list-style-type: none"> <li>- The reactions of metal with oxygen, including the terms oxidation and reduction</li> <li>- The reactivity series and how this relates to a metal's tendency to form a positive ion and their reactions with water and acid.</li> <li>- The extraction of metals by reduction of oxides</li> <li>- Oxidation and reduction in terms of electrons (HT)</li> <li>- How acids react with metals, forming salt and hydrogen</li> <li>- The neutralisation of acids to produce a salt and water, or a salt, water and carbon dioxide</li> <li>- How to make soluble salts</li> <li>- The pH scale, including the ions present in acids and alkalis, and how they react with each other</li> <li>- How to complete a titration and use the results to calculate concentration of an unknown solution (triple only)</li> <li>- The difference between strong and weak acids, and some examples of each (HT)</li> <li>- How electrolysis works, including molten and aqueous compounds, predicting the products formed, as well as how it is used to extract metals</li> <li>- How to represent the reactions of electrolysis with half equations</li> </ul>		By the end of this unit students will know and understand: <ul style="list-style-type: none"> <li>- What pure substance and formulations are</li> <li>- What chromatography is and how it works</li> <li>- How to test for hydrogen, oxygen, carbon dioxide and chlorine gas</li> <li>- How to identify metal ions through flame tests, including what positive results look like (triple only)</li> <li>- How sodium hydroxide can be used to test for some metal ions, and what positive results look like (triple only)</li> <li>- How to test for the negative ions carbonate, halide and sulfate (triple only)</li> <li>- How instrumental methods including flame emission spectroscopy are used to identify elements and compounds (triple only)</li> </ul>	By the end of this unit students will know and understand: <ul style="list-style-type: none"> <li>- The terms endothermic and exothermic, how temperature changes and some examples of each type of reaction</li> <li>- What is meant by activation energy, and how this is represented on a reaction profile of an exothermic and endothermic reaction</li> <li>- How energy is transferred when breaking or making bonds, and how this results in the overall energy change</li> <li>- How cells and batteries can be made, the differences between single use and rechargeable batteries (triple only)</li> <li>- What a fuel cell is, and how hydrogen fuel cells work, including the equations for the reactions that occur (triple only)</li> </ul>

	<p>how these relate to their structure</p> <ul style="list-style-type: none"> <li>- Uses and properties of nanoparticles</li> </ul>	<ul style="list-style-type: none"> <li>- How to use concentrations in mol/dm<sup>3</sup> to make solutions and to work out how much of a solution is needed to react completely. (triple only)</li> <li>- How to calculate the volume of gases (triple only) (HT)</li> </ul>			
<p><b>Key vocabulary</b></p>	<p>Ionic Covalent Metallic Alloy Chemical bond Nanoparticle Fullerene Diamond Graphite Silicon dioxide Giant lattice</p>	<p>Relative formula mass Mole Concentration Equation Volume Uncertainty Percentage yield Atom economy Titration</p>	<p>Acid Alkali Electrolysis Oxidation Reduction Displacement Ion Titration Anode Cathode Anion Cation</p>	<p>Formulation Qualitative Quantitative Spectroscopy Precipitation Chromatography</p>	<p>Exothermic Endothermic Reaction Profile Activation energy Catalyst Fuel cell</p>