Year 10 Chemistry Curriculum End Points and Key Vocabulary

	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
Unit of Work	Bonding, Structure and the Properties of Matter	Quantitative Chemistry	Chemical Changes		Chemical Analysis	Energy Changes
Ethos links	**STEM**- how materials behave, uses of polymers, what causes the properties of a substance (melting point, conductivity etc), uses and applications of nanotechnology **Sust.** – Environmental implications of nanotechnology	STEM - Calculations	**STEM** – extracting metals for use. **Sust.** – Using resources from the Earth sustainably.		**STEM** – using instrumental methods to identify compounds in drugs testing etc. design of formulations for a purpose	**STEM** – What is happening in a chemical reaction. **Sust.** Using hydrogen fuel cells
Knowledge	By the end of this unit students will know and understand: - How atoms form chemical bonds through transfer or sharing of electrons - How ionic, covalent and metallic bonds are formed - The properties of ionic compounds and how these relate to the structure - The properties of solids, liquids and gases and how these relate to the strength of forces between the particles of the substance - How to use state symbols in an equation - The properties of simple covalent structures and how these relate to the structure - How polymers are formed and how their structure is represented by a diagram - The properties of diamond, graphite and silicon dioxide, and how these relate to their structure - The properties of metals and alloys and how these relate to their structure	By the end of this unit students will know and understand: - The conservation of mass - Relative formula mass and how to calculate percent by mass - Why reactions might appear to involve a change in mass - What is meant by a mole and how this relates to atoms, molecules, ions, compounds and equations (HT) - What is represented in a balanced symbol equation (HT) - How the amount of reactant/product in a reaction is calculated (HT) - What is meant by limiting reactant and why they are used - What is meant by concentration - What is meant by % yield, how to calculate it and why 100% yield isn't always obtained (triple only) - What is meant by atom economy and how to calculate it (triple only)	By the end of this unit students will know and understand: - The reactions of metal with oxygen, including the terms oxidation and reduction - The reactivity series and how this relates to a metal's tendency to form a positive ion and their reactions with water and acid. - The extraction of metals by reduction of oxides - Oxidation and reduction in terms of electrons (HT) - How acids react with metals, forming salt and hydrogen - The neutralisation of acids to produce a salt and water, or a salt, water and carbon dioxide - How to make soluble salts - The pH scale, including the ions present in acids and alkalis, and how they react with each other - How to complete a titration and use the results to calculate concentration of an unknown solution (triple only) - The difference between strong and weak acids, and some examples of each (HT) - How electrolysis works, including molten and aqueous compounds, predicting the products formed, as well as how it is used to extracted metals - How to represent the reactions of electrolysis with half equations		By the end of this unit students will know and understand: - What pure substance and formulations are - What chromatography is and how it works - How to test for hydrogen, oxygen, carbon dioxide and chlorine gas - How to identify metal ions through flame tests, including what positive results look like (triple only) - How sodium hydroxide can be used to test for some metal ions, and what positive results look like (triple only) - How to test for the negative ions carbonate, halide and sulphate (triple only) - How instrumental methods including flame emission spectroscopy are used to identify elements and compounds (triple only)	By the end of this unit students will know and understand: - The terms endothermic and exothermic, how temperature changes and some examples of each type of reaction - What is meant by activation energy, and how this is represented on a reaction profile of an exothermic and endothermic reaction - How energy is transferred when breaking or making bonds, and how this results in the overall energy change - How cells and batteries can be made, the differences between single use and rechargeable batteries (triple only) - What a fuel cell is, and how hydrogen fuel cells work, including the equations for the reactions that occur (triple only)

	- The properties and uses of graphene ad fullerenes, and how these relate to their structure - Uses and properties of nanoparticles	- How to use concentrations in mol/dm^3 to make solutions and to work out how much of a solution is needed to react completely. (triple only) - How to calculate the volume of gases (triple only) (HT)			
Key vocabulary	Ionic Covalent Metallic Alloy Chemical bond Nanoparticle Fullerene Diamond Graphite Silicon dioxide Giant lattice	Relative formula mass Mole Concentration Equation Volume Uncertainty Percentage yield Atom economy Titration	Acid Alkali Electrolysis Oxidation Reduction Displacement Ion Titration Anode Cathode Anion Cation	Formulation Qualitative Quantitative Spectroscopy Precipitation Chromatography	Exothermic Endothermic Reaction Profile Activation energy Catalyst Fuel cell