

Curriculum Map Year 10 Combined Science - Chemistry

Topic Name and Outline of Content	Term	Skills developed with link to NC Subject content	Reflection on previous link in the curriculum	Progress to future link in the curriculum
Quantitative Chemistry	<i>Autumn HT1</i>	Quantitative Chemistry Calculating relative molecular mass Calculating quantities of compounds and elements in moles Multiple step calculations including <ul style="list-style-type: none"> • Calculating expected masses of reactants and products using molar ratios • Using moles to balance equations • Volumetric calculations from titre volumes and known concentrations of acids and alkalis • Percentage Yield • Atom economy • Determination of limiting reagents 	Year 7, 8 and 9 balancing of equations is a theme which is covered on numerous occasions during the initial years as it is a skill which requires practice practical technique <ul style="list-style-type: none"> • Taking the mass of substances using accurate balances • Measuring volumes of liquids • interpretation of units 	GCSE Quantitative chemistry can be assessed alongside any other GCSE Topic in various different contexts. It is taught early to ensure the skills are embedded into everyday learning. A Level Amount of substance. This is essentially the GCSE content at a higher level of numerical demand.
Structure and Bonding	<i>Autumn HT2</i>	Structure and Bonding Ionic, Covalent and Metallic Bonding Properties of: <ul style="list-style-type: none"> • Ionic lattices • Simple covalent molecules • Giant covalent molecules including diamond, graphite, silicon dioxide, graphene and fullerenes. • Metals • Nanoparticles 	Year 7 solids, liquids and gases and phase changes <ul style="list-style-type: none"> • how do we classify solids liquids and gases • what properties do each possess • how the atoms are arranged and how does this allow for specific properties 	Year 10 Spring HT4 Electrolysis which looks at the properties of ionic substances in conduction of electrolytes Year 11 Organic Chemistry (covalent bonding) A Level Bonding <ul style="list-style-type: none"> • Dative Bonding • Varying bond strength in metals • Type of bonding in relation to position on periodic table • Van der Waals forces • Permanent Dipoles • Hydrogen Bonding
Chemical Changes	<i>Spring HT3</i>	Chemical Changes <ul style="list-style-type: none"> • Reaction of metals with oxygen • Reactivity Series • Extraction of metals by carbon reduction • Oxidation and reduction in terms of electrons • Acids and Alkalis • Metals reacting with acids • Metal carbonates reacting with acid • Making soluble salts • Titration • Strong and Weak acids and alkalis 	Year 7 reactions of acids, properties of acids and alkalis, balancing of equations, naming compounds <ul style="list-style-type: none"> • Metal and acid • Metal carbonate and acid • Neutralisation Year 8 Reactivity <ul style="list-style-type: none"> • Alkali metals with water • Thermal decomposition 	A Level Inorganic Chemistry (Period 3, Transition metals, group 2, redox) <ul style="list-style-type: none"> • balancing redox equations from simple half equations or those in acidic, aqueous conditions • Reactions of complex ions in aqueous solution require skills in balancing equations and understanding of stoichiometric coefficients. • Equations for the acidic, alkaline or amphoteric nature of period 3 oxides Year 11 Carboxylic acids <ul style="list-style-type: none"> • contrasting pH of carboxylic acids vs strong acids in terms of ionisation in solution

Chemical Changes	<i>Spring HT4</i>	Chemical Changes <ul style="list-style-type: none"> ● Process of electrolysis ● Electrolysis of molten ionic compounds ● Electrolysis of Aluminium oxide ● Electrolysis of ionic solutions 	Electroplating reactions of acids, properties of acids and alkalis, balancing of equations, naming compounds Year 10 Autumn HT2 Structure and Bonding <ul style="list-style-type: none"> ● properties of ionic compounds links to electrolysis and conduction in an electrolyte 	A Level Electrochemical cells and redox <ul style="list-style-type: none"> ● relation of voltage to different emf values for different metals ● balancing redox equations from simple half equations or those in acidic, aqueous conditions
Energy Changes	<i>Summer HT5</i>	Energy Changes <ul style="list-style-type: none"> ● Exothermic and endothermic reactions ● Bond energy calculations ● Energy profile diagrams for exothermic and endothermic reactions ● Calorimetry ● Cells and batteries ● Fuel Cells (How they work, benefits and limitations) 	Year 8 Energy changes, Fuels <ul style="list-style-type: none"> ● Basic definitions of exothermic and endothermic ● How to measure energy changes in practicals 	A Level Electrochemical cells, Thermodynamics, Energetics <ul style="list-style-type: none"> ● Hess Cycles ● Born Haber Cycles ● Calorimetry
Preparation for exams	<i>Summer HT6</i>	Application of all knowledge to a range of implemented exam questions from all areas of the year 10 course.	end of unit/year testing	A Level Exam technique (Reading and understanding questions, time management, application of scientific skills)