Curriculum Map Year 10 Separate Science - Chemistry

Topic Name	**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	*Autumn HT1*	**Quantitative Chemistry** Calculating relative molecular mass Calculating quantities of compounds and elements in moles Multiple step calculations including: ● 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 ● 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	*Autumn HT2*	**Structure and Bonding** Ionic, Covalent and Metallic Bonding Properties of: ● 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 ● 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 ● 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	*Spring HT3*	**Chemical Changes** ● 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 ● Metal and acid ● Metal carbonate and acid ● Neutralisation Year 8 Reactivity ● Alkali metals with water ● Thermal decomposition	**A Level** Inorganic Chemistry (Period 3, Transition metals, group 2, redox) ● 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 ● contrasting pH of carboxylic acids vs strong acids in terms of ionisation in solution

Chemical Changes	*Spring HT4*	**Chemical Changes** ● 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 ● properties of ionic compounds links to electrolysis and conduction in an electrolyte	**A Level** Electrochemical cells and redox ● 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	*Summer HT5*	**Energy Changes** ● 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 ● Basic definitions of exothermic and endothermic ● How to measure energy changes in practicals.	**A Level** Electrochemical cells, Thermodynamics, Energetics ● Hess Cycles ● Born Haber Cycles ● Calorimetry
Preparation for exams	*Summer HT6*	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)