Curriculum Map Year 11 Combined 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
Organic Chemistry	*Autumn HT1*	● Crude oil, hydrocarbons and alkanes ● Fractional distillation and petrochemicals ● Properties of hydrocarbons ● Cracking and alkenes	**Year 7:** Separating Mixtures ● condensation ● evaporation ● Simple distillation of inky water **GCSE** Covalent bonding and properties of simple covalent molecules ● This content allows pupils to make the link between molecule size and boiling point due to relative strength of intermolecular forces.	**A level:** Organic Chemistry ● Nomenclature ● Synthesis ● Reaction conditions ● Biochemistry ● Esters ● Acylation ● Polymers .
Rate of Reaction and Extent of Chemical Change	*Autumn HT2*	● Calculating rates of reactions ● Factors which affect the rates of chemical reactions ● Collision theory and activation energy ● Catalysts ● Reversible reactions ● Energy changes and reversible reactions ● Equilibrium ● The effect of changing conditions on equilibrium (HT only) ● The effect of changing concentration (HT only) ● The effect of temperature changes on equilibrium (HT only ● The effect of pressure changes on equilibrium (HT only)	**Year 7** Rates of Reaction practical ● Students investigate the surface area of Jelly babies and time taken to dissolve in water. ● A graph is plotted ● Particle theory and collisions between water and Jelly baby particles are discussed.	**A Level** ● Kinetics and Rate Equations ● Le Chatelier's Principle ● Maxwell Boltzmann Distributions ● Reaction Orders
Chemical Analysis	*Spring HT3*	● Pure substances ● Formulations ● Chromatography ● Identification of common gases	**Year 7** Solubility Chromatography ● Simple paper chromatography of pen ink introduces students to Rf values and the relationship between solubility and distance travelled in solvent. **Year 8** Reactions of Metals with acids and metal carbonates with acid ● Test for hydrogen ● Test for carbon dioxide	**KS5** Chemical Analysis ● NMR ● IR ● TOF Mass Spectrometry ● Ion Tests ● GC ● Flame Emission ● Column Chromatography ● TLC **Group 2** ● Barium Chloride test for sulfate **Group 7** ● Testing for halide ions

Atmospheric Chemistry and Using Resources	*Spring HT4*	• The proportions of different gases in the atmosphere • The Earth's early atmosphere • How oxygen increased • How carbon dioxide decreased • Greenhouse gases • Human activities which contribute to an increase in greenhouse gases in the atmosphere • Global climate change • The carbon footprint and its reduction • Atmospheric pollutants from fuels • Properties and effects of atmospheric pollutants • Using the Earth's resources and sustainable development • Potable water • wastewater treatment • Alternative methods of extracting metals (HT only) • Life cycle assessment • Ways of reducing the use of resources	**Year 8:** Fuels • complete and incomplete combustion **Year 8:** Climate Change • global warming • acid rain **Year 8:** Sustainability • Recycling • Life Cycle assessments • Impact of metal extraction	**A Level** • Free Radical Chemistry • Atmospheric Pollutants • Polymer disposal • Choosing Suitable Reagents Use of alternative fuels such as Biodiesel from lipids.
Preparation for Examinations	*Summer HT5*			