

Year 10: Combined Chemistry	- Curriculum Intent: Year 10 Chemistry tackles more complex ideas and concepts in the subject. It builds on the key knowledge from years 7,8 and 9 to link together all the areas of the subject. The key areas of particles, reactions, monitoring reactions and earth and environmental science are developed through more challenging topics such as, mole calculations, electrolysis and trends in the periodic table. Knowledge of key industrial chemical processes is also developed. Procedural knowledge and practical skills are developed further, building on experience with making salts, neutralisation, redox and displacement reaction. The curriculum in year 10 aims to bring everything together so that students have a complete understanding of the Chemistry aspect of the Combined Science course by the end of Yr 10.					
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Key ideas and sequence of learning	Module C3 - Chemical reactions • Formulae of compounds • Formulae of ionic compounds • Conservation of mass • Balancing equations • Half equations and ionic equations (H) • Detecting gases • Moles • Concentration and moles	Module 3 - Chemical reactions • Endothermic and exothermic reactions • Reaction profiles • Bond energies (H) • Acid and alkali reactions • pH and neutralisation • reactions of acids • REDOX • Electrolysis reactions	Chemistry module 4 C4- Predicting and Identifying reactants and products • Group 1 • Group 7 • Group 0 • Reactivity of metals Module 5: Monitoring and controlling chemical reactions. • Rates of reactions • Calculating the rate of reactions from graphs and data • Calculating average rate Calculating instantaneous rate	Module 5: Monitoring and controlling chemical reactions. • Reversible reactions • Equilibrium • Choosing reaction conditions Module 6: Global challenges • Extracting metals • Extracting iron • Extracting aluminium • Phytoextraction • Bioleaching	Students sit their EoY exams Students will review their PPE exam papers. Module 6: Global challenges • Alkanes and fractional distillation of crude oil • Cracking • Choosing and recycling materials • Formation of atm • Pollution and atm • Climate change • Potable water	Recap and reteach C1 (particles) C2.1 and C2.2 a(elements, compounds and mixtures) C4: Predicting and Identifying reactants and products (See Year 9 curriculum for C1 and C2)

Key Questions	- How do you write the formulae of ionic compounds given its ions? - How do you balance a chemical equation? - What are the 4 state symbols? - What is a mole? - How do you calculate moles? - How do you use mole ratios to find reacting masses?	- When does hydrogen and oxygen form during electrolysis? - Can you write half equations to describe electrolysis? - Can you define reduction and oxidation in terms of electrons? - Can you write ionic and half equations to describe redox reactions? - Can you use bond energies to calculate if a reaction is endothermic or exothermic? - What is a neutralisation reaction? - What is the difference between dilute and concentrated acids? - What is the difference between strong and weak acids? - How does the pH relate to the H^+ concentration?	- How can we predict trends in the periodic table for Group 1 and Group 7? - Can you write and balance reactions with group 1? - How can we predict the products in a displacement reaction - Can you calculate the average rate of reaction from data or a graph? - Can you calculate the instantaneous rate of reaction from a graph?	- What is equilibrium? - How does temperature affect equilibrium position? - How does pressure affect equilibrium position? - How are metals extracted from ore using carbon? - How does electrolysis extract aluminium and what are its advantages and disadvantages? - What are the advantages and disadvantages of extracting metals with biological methods?	- How is crude oil extracted using fractional distillation? - Why is cracking carried out? - How are materials recycled? - Choosing materials by analysing the properties - How was our atmosphere formed and how has it evolved? - Cause, effect and controlling pollutants - Impact of carbon emission on climate change	
Vocabulary	- Hydrogen - Carbon dioxide - Oxygen	- Endothermic - Exothermic - Cation & anion	- Reactivity - Trends - Nuclear attraction	- Extraction - Blast furnace - Electrolysis	- Alkanes - Saturated hydrocarbon	(see Year 9 Schemes Of Learning's for

	- Chlorine - Moles	- Anode & cathode - Electrolysis - Reduction - Oxidation - PANIC - Half equation - Ionic equation - Neutralisation - Dilute - Concentrated - Strong acid - Weak acid - Dissociation - Hydrogen ion - pH	- Outer electron - Displacement reaction - Equilibrium - Forward reaction - Reverse reaction - Average rate - Instantaneous rate - Tangent - Gradient - Reactant - Product	- Ore - Cryolite - Bauxite - Phytoextraction - Bioleaching - Low grade ore	- Unsaturated hydrocarbons - Homologous series - Saturated hydrocarbons - Unsaturated hydrocarbons - Combustion - Cracking - Potable water - Greenhouse gases - Climate change	combined vocabulary for C1 and C2)
Practical Skills	- Conservation of mass – making magnesium oxide and calcium carbonate with acid - Detecting gases – hydrogen, oxygen, chlorine and carbon dioxide.	- Electrolysis of copper chloride solution - pH of acids - Making salts such as copper sulfate and sodium chloride	- Reactivity trends for halogens- displacement reaction - Reactivity of metals- making and recording observations in displacement reactions - Monitoring rates of reaction to investigate the effect to temperature, catalyst, concentration and surface area on the rate of reaction	Extracting copper from copper carbonate	- Use bromine water test to distinguish between alkanes and alkenes - Acid rain formation	