(Year 10 Chemistry) Long-Term Plan

Ousedale School
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Long-term planning (LTPs) - Planning how the key concepts, knowledge, skills identified in the Progression map will be delivered termly per year group
Ensuring that end points & NC/spec are covered
Identifying what assessments are planned and when
Ensuring whole school intent priorities to be planned for

(Year 10 Chemistry)						
	Autumn 1	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
Unit title:	C3 Structure and Bonding	C4 Quantitative chemistry / C5 Chemical changes	C5 Chemical changes / C6 Electrolysis	C7 Energy changes / C9 Crude oil and fuels	Paper 1 Revision Units C1 to C7	C8 Rates and equilibrium
Unit length:	10 lessons	9 lessons / 5 lessons	4 lessons / 5 lessons	7 lessons / 5 lessons	10 lessons	9 lessons
Key concepts:	States of matter and Particle model; Atoms into ions; Ionic bonding; Covalent bonding; Metallic bonding; Structure and properties of different substances; Allotropes of carbon Nanoparticles.	Relative masses and moles; Equations and calculations; From masses to balanced equations; The yield of a chemical reaction; Atom economy: Expressing concentrations; Titrations; Titration calculations; Volume of gases. --- The reactivity series; Displacement reactions; Extracting metals; Salts from metals; Insoluble bases.	Making more salts; Neutralisation and pH scale; Strong and weak acids. --- Electrolysis; Changes at the electrodes; Extraction of aluminium; Electrolysis of aqueous solutions;	Exothermic and endothermic reactions; Using energy transfers from reactions; Reaction profiles; Bond energy calculations; Chemical cells and batteries; Fuel cells --- Hydrocarbons; Fractional distillation; Burning hydrocarbon fuels; Cracking hydrocarbons;		Rate of a reaction; Collision theory and surface area; The effect of temperature on rate; The effect of concentration or pressure on rate; The effect of catalysts on rate; Reversible reactions; Energy and reversible reactions; Dynamic equilibrium; Altering conditions (The Haber process)
Knowledge/ Skills:	Use the particle model to explain the energy transfers involved when substances change state.	Understand relative atomic mass and relative formula mass. Use relative atomic masses to calculate relative	Describe how salts are prepared, from metals and acids, acids and bases, and acids and carbonates. Prepare a pure, dry sample	Understand that an exothermic reaction transfers energy from the system to the surroundings, and an		Know the factors that affect the rate of a reaction, including temperature, surface area, concentration, and

	Describe the difference in bonding and properties of giant ionic structures, simple covalent molecules, and giant covalent structures (including different arrangements of carbon). Understand that covalent, metallic, and ionic bonding is strong, but that it is how the particles interact (intermolecular forces) that determines properties such as melting point, boiling point, and electrical conductivity. Explain how the surface area to volume ratio of nanoparticles is different to bulk material, and how this affects their uses.	formula masses of compounds. Use the equation number of moles = mass (g) / *A*r and use moles to balance symbol equations and calculate reacting masses. Calculate the percentage yield and percentage atom economy of a reaction. Apply understanding of relative atomic mass, relative formula mass, and moles to concentrations. Carry out calculations with concentrations in g/dm^3, and with concentrations in mol/dm^3 and with calculating moles in gases. Describe titration use titration results to calculate the concentration of an unknown solution. ---------- Recall and describe the reactions of the metals potassium, sodium, lithium, calcium, magnesium, zinc, iron, and copper with water and acids. Apply understanding of the reactivity series to displacement reactions and the extraction of metals. (HT)Understand the concepts of oxidation and reduction as the loss and gain of electrons respectively. Describe how salts are prepared.	of a salt from an insoluble metal oxide or carbonate. Describe the pH scale. (HT) Explain how pH relates to H+(aq) ion concentration and the difference between strong and weak acids. ---------- Explain why ionic compounds can undergo electrolysis when molten or in solution. Explain the movement of particles during electrolysis, and the reactions that occur at the electrodes. Apply understanding of electrolysis to the extraction of aluminium, and describe how to investigate the electrolysis of a solution. Predict the products of electrolysis. (HT) Write balanced half equations.	endothermic reaction transfers energy from the surroundings to the system. Interpret experimental data to identify if a reaction is exothermic or endothermic. Describe some uses of exothermic and endothermic reactions. Sketch and interpret reaction profile diagrams. (HT) Use bond energies to calculate overall energy changes for a reaction, and identify if it is exothermic or endothermic. Apply understanding of the reactivity series and electrolysis to chemical cells and fuel cells. ---------- Identify alkanes from their formulae, and name and draw the displayed formula of the first four alkanes. Describe reactions of hydrocarbons, including combustion (both complete and incomplete) and cracking. Write balanced symbol equations for the complete combustion of hydrocarbons. Describe the conditions of cracking. Describe the test for alkenes. Describe crude oil as a source of hydrocarbons and explain the fractional distillation of crude oil. Describe how the size of the hydrocarbon molecule affects its properties,		pressure. Explain the effect of each factor on the rate of reaction using collision theory – understanding that each factor increases the *frequency* of effective collisions, **not** just the number of collisions. Explain the effect of catalysts on the rate of a reaction in terms of providing an alternative reaction pathway with a lower activation energy. Describe reversible reactions and dynamic equilibrium. Apply knowledge on endothermic and exothermic reactions to equilibrium reactions to predict the effect of temperature changes on the reversible reactions and the position of the equilibrium. (HT) Use Le Châtelier's principle to explain the effect of temperature and pressure on the position of equilibrium.

				including viscosity, boiling point, and flammability.		
End points covered:						
NC/Spec coverage:	Structure and Bonding 4.2.1.1 / 4.2.1.2 / 4.2.1.3 / 4.2.1.4 / 4.2.1.5 / 4.2.2.1 / 4.2.2.2 / 4.2.2.3 / 4.2.2.4 / 4.2.2.5 / 4.2.2.6 / 4.2.2.7 / 4.2.2.8 / 4.2.3.1 / 4.2.3.2 / 4.2.3.3 / 4.2.4.1 / 4.2.4.2	Quantitative chemistry 4.3.1.1 / 4.3.1.2 / 4.3.1.3 / 4.3.1.4 / 4.3.2.1(HT) / 4.3.2.2(HT) / 4.3.2.3(HT) / 4.3.2.4(HT) / 4.3.2.5 / 4.3.3.1 / 4.3.3.2 / 4.3.4(HT) / 4.3.5(HT) Chemical changes 4.4.1.1 / 4.4.1.2 / 4.4.1.3 / 4.4.1.4(HT) / 4.4.2.1 / 4.4.2.2 / 4.4.2.3 / 4.4.2.4 / 4.4.2.5 / 4.4.2.6(HT)	Chemical changes 4.4.1.1 / 4.4.1.2 / 4.4.1.3 / 4.4.1.4(HT) / 4.4.2.1 / 4.4.2.2 / 4.4.2.3 / 4.4.2.4 / 4.4.2.5 / 4.4.2.6(HT) Electrolysis 4.4.3.1 / 4.4.3.2 / 4.4.3.3 / 4.4.3.4 / 4.4.3.5(HT)	Energy changes 4.5.1.1 / 4.5.1.2 / 4.5.1.3(HT) / 4.5.2.1 / 4.5.2.2 Crude oil and fuels 4.7.1.1 / 4.7.1.2 / 4.7.1.3 / 4.7.1.4	4.1 / 4.2 / 4.3 / 4.4 / 4.5 / 4.6	Rates and equilibrium 4.6.1.1 / 4.6.1.2 / 4.6.1.3 / 4.6.1.4 / 4.6.2.1 / 4.6.2.2 / 4.6.2.3 / 4.6.2.4(HT) / 4.6.2.5(HT) / 4.6.2.6(HT) / 4.6.2.7(HT)
Cross-curricular links:						
Assessments:	EoU tests APs Trial exams GCSE exams	EoU tests APs Trial exams GCSE exams	EoU tests APs Trial exams GCSE exams	EoU tests APs Trial exams GCSE exams		EoU tests APs Trial exams GCSE exams
Other school intent priorities						
New experiences – broadening horizons						
Developing character – *Kind, Hard*						

Working, Successful						
Context specific need – diversity, inclusion; reading, literacy; mental health						
Curriculum Careers - Gatsby 4						