CC13: **Groups in the Periodic Table** (Paper 2)
CC14: **Rates of Reaction** (Paper 2)
CC15: **Heat Energy Changes in Chemical Reactions** (Paper 2)

Lesson	Objectives Tracker Sheet	Date covered	I know this well	I need to do more work on this
CC13a Group 1	6.1 Explain why some elements can be classified as alkali metals (group 1), halogens (group 7) or noble gases (group 0), based on their position in the periodic table.			
	6.2 Recall that alkali metals (a) are soft (b) have relatively low melting points.			
	6.3 Describe the reactions of lithium, sodium and potassium with water.			
	6.4 Describe the pattern in reactivity of the alkali metals, lithium, sodium and potassium, with water; and use this pattern to predict the reactivity of other alkali metals.			
	6.5 Explain this pattern in reactivity in terms of electronic configurations.			
CC13b Group 7	6.6 Recall the colours and physical states of chlorine, bromine and iodine at room temperature.			
	6.7 Describe the pattern in the physical properties of the halogens, chlorine, bromine and iodine, and use this pattern to predict the physical properties of other halogens.			
	6.8 Describe the chemical test for chlorine.			
	6.9 Describe the reactions of the halogens, chlorine, bromine and iodine, with metals to form metal halides, and use this pattern to predict the reactions of other halogens.			
	6.10 Recall that the halogens, chlorine, bromine and iodine, form hydrogen halides which dissolve in water to form acidic solutions, and use this pattern to predict the reactions of other halogens.			
CC13c Halogen reactivity	6.11 Describe the relative reactivity of the halogens chlorine, bromine and iodine, as shown by their displacement reactions with halide ions in aqueous solution, and use this pattern to predict the reactions of astatine.			
	6.12 **H** Explain why these displacement reactions are redox reactions in terms of gain and loss of electrons, identifying which of these are oxidised and which are reduced.			

	6.13 Explain the relative reactivity of the halogens in terms of electronic configurations.			
CC13d Group 0	6.14 Explain why the noble gases are chemically inert, compared with the other elements, in terms of their electronic configurations.			
	6.15 Explain how the uses of noble gases depend on their inertness, low density and/or nonflammability.			
	6.16 Describe the pattern in the physical properties of some noble gases and use this pattern to predict the physical properties of other noble gases.			
CC14a Rates of reaction	C7.1 Investigate the effects of changing the conditions of a reaction on the rates of chemical reactions by: measuring the production of a gas (in the reaction between hydrochloric acid and marble chips) observing a colour change (in the reaction between sodium thiosulfate and hydrochloric acid)			
	C7.2 Suggest practical methods for determining the rate of a given reaction.			
	C7.5 Interpret graphs of mass, volume or concentration of reactant or product against time.			
CC14b Factors affecting reaction rates	C7.3 Explain how reactions occur when particles collide and that rates of reaction are increased when the frequency and/or energy of collisions is increased.			
	C7.4 Explain the effects on rates of reaction of changes in temperature, concentration, surface area to volume ratio of a solid and pressure (on reactions involving gases) in terms of frequency and/or energy of collisions between particles.			
CC14b Investigating reaction rates – Core Practical	C7.1 Investigate the effects of changing the conditions of a reaction on the rates of chemical reactions by: a measuring the production of a gas (in the reaction between hydrochloric acid and marble chips) b observing a colour change (in the reaction between sodium thiosulfate and hydrochloric acid).			
CC14c Catalysts and activation energy	C7.6 Describe a catalyst as a substance that speeds up the rate of a reaction without altering the products of the reaction, being itself unchanged chemically and in mass at the end of the reaction.			
	C7.7 Explain how the addition of a catalyst increases the rate of a reaction in terms of activation energy.			

	C7.8 Recall that enzymes are biological catalysts and that enzymes are used in the production of alcoholic drinks.			
CC15a Exothermic and Endothermic reactions	C7.9 Recall that changes in heat energy accompany the following changes: salts dissolving in water neutralisation reactions displacement reactions precipitation reactions and that, when these reactions take place in solution, temperature changes can be measured to reflect the heat changes.			
	C7.10 Describe an exothermic change or reaction as one in which heat energy is given out.			
	C7.11 Describe an endothermic change or reaction as one in which heat energy is taken in.			
CC15b Energy changes in reactions	C7.12 Recall that the breaking of bonds is endothermic and the making of bonds is exothermic.			
	C7.13 Recall that the overall heat energy change for a reaction is: exothermic if more heat energy is released in forming bonds in the products than is required in breaking bonds in the reactants endothermic if less heat energy is released in forming bonds in the products than is required in breaking bonds in the reactants.			
	C7.14 **H** Calculate the energy change in a reaction given the energies of bonds (in kJ mol–1).			
	C7.15 Explain the term activation energy.			
	C7.16 Draw and label reaction profiles for endothermic and exothermic reactions, identifying activation energy.			