SC14: **Quantitative Analysis** (Paper 1)
SC15: **Dynamic Equilibria, Calculations Involving Volumes of Gases** (Paper 1)
SC16: **Chemical Cells and Fuel Cells** (Paper 1)

Lesson	Objectives Tracker Sheet	Date covered	I know this well	I need to do more work on this
SC14a Yields	C5.11C Calculate the percentage yield of a reaction from the actual yield and the theoretical yield.			
	C5.12C Describe that the actual yield of a reaction is usually less than the theoretical yield and that the causes of this include: incomplete reactions practical losses during the experiment competing, unwanted reactions (side reactions).			
SC14b Atom economy	C5.13C Recall the atom economy of a reaction forming a desired product.			
	C5.14C Calculate the atom economy of a reaction forming a desired product.			
	C5.15C **H** Explain why a particular reaction pathway is chosen to produce a specified product, given appropriate data such as atom economy, yield […] and usefulness of by-products			
SC14c Concentrations	C5.8C **H** Calculate the concentrations of solutions in mol dm−3 and convert concentration in g dm−3 into mol dm−3 and vice versa.			
	C5.10C **H** Carry out simple calculations using the results of titrations to calculate an unknown concentration of a solution or an unknown volume of solution required			
SC14d Acid-alkali titration – Core Practical	C5.9C Carry out an accurate acid-alkali titration, using burette, pipette and a suitable indicator.			
SC14e Molar volume of gases	C5.16C **H** Describe the molar volume, of any gas at room temperature and pressure, as			

	the volume occupied by one mole of molecules of any gas at room temperature and pressure.			
	C5.17C **H** Use the molar volume and balanced equations in calculations involving the masses of solids and volumes of gases.			
	C5.18C **H** Use Avogadro's law to calculate volumes of gases involved in a gaseous reaction, given the relevant equation.			
SC15a Fertilisers and the Haber process	C5.19C Describe the Haber process as a reversible reaction between nitrogen and hydrogen to form ammonia.			
	C5.22C Recall that fertilisers may contain nitrogen, phosphorus and potassium compounds to promote plant growth.			
	C5.23C Describe how ammonia reacts with nitric acid to produce a salt that is used as a fertiliser.			
	C5.24C Describe and compare: the laboratory preparation of ammonium sulfate from ammonia solution and dilute sulfuric acid on a small scale the industrial production of ammonium sulfate, used as a fertiliser, in which several stages are required to produce ammonia and sulfuric acid from their raw materials and the production is carried out on a much larger scale (details of the industrial production of sulfuric acid are not required).			
SC15b Factors affecting equilibrium	C5.15C **H** Explain why a particular reaction pathway is chosen to produce a specified product, given appropriate data such as […], rate, equilibrium position […].			
	C5.20C **H** Predict how the rate of attainment of equilibrium is affected by: changes in temperature changes in pressure changes in concentration			

	use of a catalyst			
	C5.21C **H** Explain how, in industrial reactions, including the Haber process, conditions used are related to: the availability and cost of raw materials and energy supplies the control of temperature, pressure and catalyst used to produce an acceptable yield in an acceptable time.			
SC16a Chemical cells and fuel cells	C5.25C Recall that a chemical cell produces a voltage until one of the reactants is used up			
	C5.26C Recall that in a hydrogen–oxygen fuel cell hydrogen and oxygen are used to produce a voltage and water is the only product.			
	C5.27C Evaluate the strengths and weaknesses of fuel cells for given uses.			