Chemistry Year 11 Curriculum Overview Triple

	Autumn			Spring			Summer	
	Learning Cycle 1			Learning Cycle 2			Learning Cycle 3	
Topic	Quantitative Triple only	Analysis Triple only	Organic II –Triple only	Haber Process Triple Only	Review of Electrolysis	Review of Rates	Review of Required Practicals	Review of all topics
Critical Prior Knowledge	KS3: Atoms and elements, mixtures and solubility, Periodic Table Y9 Atomic structure and formulae	KS3: Mixtures and solubility,	Bonding Carbon Chemistry	Reversible reactions. Energy in reactions Making salts	Ionic Bonding, extraction of Aluminium	Particle theory	Practical skills developed through doing the required practical during the previous 2 years	
Overall Intent (Big ideas and key concepts)	Calculating yield and atom economy in reactions. Titration and gas volume calculations	Pure and impure substances. Formulations and their uses. Chromatography including Rf.	Introduction to nanoparticles. Their properties and uses. Reactions of alkenes and alcohols	How reaction conditions affect the yield of product in reversible reactions and apply this to the production of ammonia explaining why the idealised conditions are not used but a compromise reached. Explain the uses of ammonia and	Electrolysis of melts and solutions. Half equations. Oxidation and reduction. Applications of electrolysis.	The effect of temperature, concentration, pressure, surface area and catalysts on the rate of reaction. Measuring and interpreting the rate of reaction.	Understand the 10 key practicals which could be described in the exam	

				the production of fertilisers				
Essential Knowledge milestones (What students must master)	A fundamental part of chemistry to be able to calculate mass of substances required and formed in chemical reactions. Students will be introduced to moles. This will build on understanding of mass of atoms developed in atomic structure. Calculate concentrations and use the data from titrations to calculate unknown concentrations. To calculate gas volumes in reactions.	Formulations make up many of the products used on daily basis. Understanding of these will be developed alongside and understanding of a range of analytical methods. Forensic scientists and drug control scientists rely on such methods in their work. This work brings together understanding from numerous previous topics including chromatography introduced in Y7	Students will learn the role organic compounds have as fuels and as the basis of many chemical compounds and materials. Although knowledge of organic chemistry is new, links are draw to work done previously in structure and bonding and material chemistry. There are also links here to work covered in biology when looking at natural polymers	Explain the raw materials needed to make ammonia and where they come from. Describe the ideal conditions needed to make ammonia and explain why they are not used in practice. Interpret graphs of reaction conditions versus rate. Apply principles of dynamic equilibrium to the Haber process. Describe the uses of ammonia to make nitric acid and	Students will build on previous understanding of reactions involving acids and they will be introduced to electrolysis. In electrolysis students will draw on knowledge of ionic compounds	Understand that variables t can be manipulated in order to speed up or slow them down chemical reactions. In industry, chemists and chemical engineers determine the effect of different variables on reaction rate and yield of product.	Students are able to describe in detail the methods needed to perform the 8 required practicals which are asked about in the two final papers	

				ammonium slats. Describe the industrial production of NPK fertiliser from phosphate rock and acid.				
Cultural Capital	Moral Capital- Atom economy in industry Communication of Science ideas and concepts	Practical techniques, health and safety, development of fine motor and dexterity skills	Moral capital- Green chemistry and use of resources	Haber process and Le Chatalier's principles	Moral capital- Green chemistry and use of resources	Moral capital- Green chemistry and use of resources	Practical techniques, health and safety, development of fine motor and dexterity skills	
Assessment Points	Regular Afl embedded into lessons. <u>Knowledge Assessment</u> Quantitative, Analysis, Organic Term 1 – Progress Assessment (Mock exam)			Regular Afl embedded into lessons. <u>Knowledge Assessment</u> Haber process, Electrolysis, rates Term 2 – Progress Assessment (Mock exam)			Regular Afl embedded into lessons. Final external exams	
ECC Student Characteristics	Through these units we will encourage students to work hard and be **resilient individuals** who **embrace challenge** and through their **creativity** and endeavours become **reflective learners.** Mastering the key concepts of each topic before being able to build on these ideas as they are interleaved through other units later in the course.							
Connection to future learning	Review and revisiting all topics in the run up to the final exams in May			Review and revisiting all topics in the run up to the final exams in May				

(When is this developed / revisited)?				