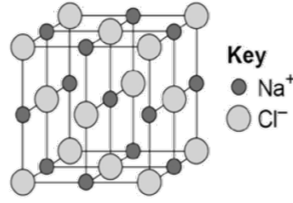
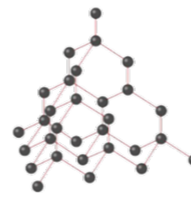

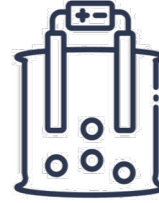
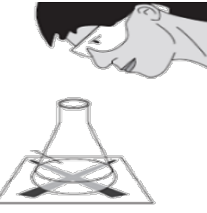
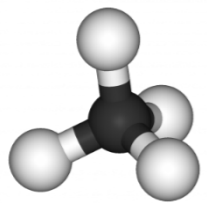
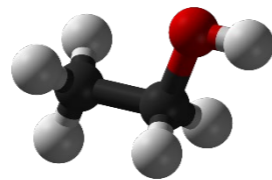
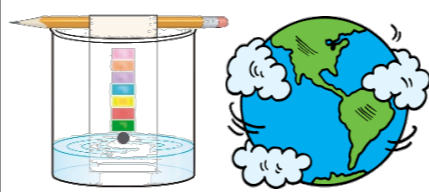

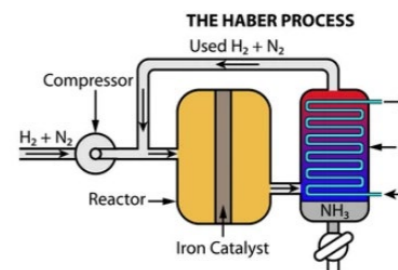



Key Stage 4 Curriculum Journey: Chemistry (1xGCSE)

Our KS4 Chemistry curriculum prepares students for a smooth transition to post-16 Chemistry and beyond. Chemistry is the science of materials; therefore you will learn the fundamental building blocks of organic and inorganic materials, their physical properties and how they interact with other building blocks. Throughout the course of human history, the discovery of new materials and their properties has always underpinned the development of society. Now is no exception!

YEAR 10 CURRICULUM JOURNEY						
	Half Term 1	Half Term 2	Half Term 3	Half Term 4	Half Term 5	Half Term 6
Topic	<p>Introduction to KS4 Chemistry: KS4: Atomic Structure KS4: Periodic Table KS4: Chemical Changes KS4: Energy Changes</p>	<p>Bonding & Structure</p> 	<p>Bonding & Properties</p> 	<p>Quantitative Chemistry</p> 	<p>Electrolysis</p> 	<p>Rates of reaction</p> 
Chemistry	<ul style="list-style-type: none"> Describe atoms using the nuclear model. Explain why the periodic table was a breakthrough in how to order elements and how it has changed over time. Write word and balanced symbol equations for chemical reactions Use the particle model to explain how a chemical reaction occurs. Evaluate in detail the uses of exothermic and endothermic reactions. RP: Investigate the variables that affect temperature changes in reacting solutions Explain the concept of energy transfer with respect to chemical cells and fuel cells 	<ul style="list-style-type: none"> Describe States of Matter Theory with heating and cooling curves Evaluate the particle model, explaining its limitations Recognise a covalent compound from its formula, name, or diagram showing bonds. Explain, in terms of electronic structure, how unfamiliar elements become ions. Relate ions and ionic bonding Explain how a covalent bond forms in terms of electronic structure. Describe the structure of simple molecules Describe an intermolecular force. 	<ul style="list-style-type: none"> Explain the properties of diamond and graphite in terms of bonding. Use a molecular model of a giant covalent structure to predict and explain its physical properties Recognise the structure of a fullerene or nanotubes Recognise and represent metallic bonding Evaluate different models of metallic bonding. Justify why alloys are more often used than pure metals. State a definition of nanoscience. Justify why nanotechnology research should continue. 	<ul style="list-style-type: none"> Calculate relative atomic and formula mass Explain why relative atomic masses may not be a whole number. Use the mole equation Explain why chemical equations must be balanced Calculate reacting masses and masses to balance equations Calculate concentrations Calculate the yield of a Chemical reaction Calculate atom economy Calculate quantities from titrations Calculate the volume of gases at room temperature 	<ul style="list-style-type: none"> Describe the electrolysis of molten and aqueous compounds Write a word equation to describe the electrolysis of a molten ionic compound Construct half-equations Describe the extraction of aluminium using electrolysis RP: Predict products of the electrolysis of aqueous solutions Describe how to electrolyse brine in terms of ions moving. Compare and contrast the electrolysis of a compound in solution with its electrolysis as a molten compound. 	<ul style="list-style-type: none"> Safely describe and follow a method to monitor rate of reaction. Calculating rate of reaction Plot and use a graph to calculate the gradient to measure the rate of reaction. Apply collision theory and describe surface area Describe the effect of temperature, concentration, pressure and catalysts RP: Investigating rate of reaction Describe reversible reactions Apply dynamic equilibrium Explain the effect of altering conditions of reactions at equilibrium
Key Knowledge, Skills & Understanding	<p>*RP = Required Practical **HT = higher tier content only</p>					
GCSE Assessment Objectives-	<p>Working scientifically (WS) - Students develop their working scientifically skills so that they can fully understand the scientific process. These skills fall broadly into four main strands and exams will include questions that assess all of these strands: 1. The development of scientific thinking 2. Experimental skills and strategies 3. Analysis and evaluation 4. Vocabulary, units, symbols and nomenclature.</p> <p>Maths Skills (MS) – In Chemistry, a minimum of 20% of marks will test mathematical skills.</p> <p>Assessment Objectives (AO) - The exams will measure how students have achieved the following assessment objectives. AO1-Demonstrate knowledge and understanding of scientific ideas, scientific techniques and procedures AO2-Apply knowledge and understanding of scientific ideas, scientific enquiry, techniques and procedures AO3-Analyse information and ideas to interpret, evaluate, make judgements, draw conclusions, develop and improve experimental procedures</p>					
MAPs	MAP 1: KS4 Chemistry: Fundamental Ideas (Energy Changes R.P.)	MAP 2: Bonding, structures & properties	MAP 3: Bonding, structures & properties (combined with MAP 2)	MAP 4: Quantitative Chemistry	MAP 5: Electrolysis	P2S3: Content to cover all prior learning

YEAR 11 CURRICULUM JOURNEY						
	Half Term 1	Half Term 2	Half Term 3	Half Term 4	Half Term 5	Half Term 6
Topic	Organic Chemistry Crude Oil & Fuels 	Organic Chemistry Organic Reactions & Polymerisation 	Chemical Analysis & The Earth's Atmosphere 	Earth's Resources 	Using Resources 	Exam technique, preparation, and focus 
Key Knowledge, Skills & Understanding *RP = Required Practical **HT = higher tier content only	<ul style="list-style-type: none"> State what hydrocarbons are Explain why fractional distillation is used to separate crude oil into fractions. Link properties of a fraction of crude oil to its use. Write combustion equations for burning hydrocarbon fuels Describe the cracking of hydrocarbons Use examples to explain the process of cracking and why it is so important to the petrochemical industry. Reactions of the alkenes Describe structures of alcohols, carboxylic acids and esters 	<ul style="list-style-type: none"> Detail the reactions and uses of alcohols Describe the structure and reactivity of carboxylic acids Describe the structure and reactivity of esters Compare addition and condensation polymerisation Describe natural polymers and DNA Compare pure substances, mixtures and formulations Analysing chromatograms RP: Chromatography Describe gas tests (carbon dioxide, oxygen, hydrogen and chlorine) 	<ul style="list-style-type: none"> Explain how to test for positive and negative ions RP: Identifying ions Instrumental analysis Evaluate the use of instrumental techniques Describe the history of our Atmosphere Explain how our atmosphere has evolved Describe the effects of the main greenhouse gases Suggest causes of global climate change Explain the effects of atmospheric pollutants 	<ul style="list-style-type: none"> Compare finite and renewable resources Describe how water can be made safe to drink RP: Water purification Treating waste water Describe different methods of extraction of metals from ores Evaluate life cycle assessments of different products Reduce, reuse, recycle Suggest ways of minimising the environmental impact of exploiting raw materials. 	<ul style="list-style-type: none"> Explain the conditions needed for rusting to occur Describe useful alloys The properties of polymers Compare glass, ceramics and composites as materials Making ammonia- The Haber process Economics of The Haber process Justify why the conditions used in the Haber process are a compromise. 	<ul style="list-style-type: none"> Focus on exam practise and the skills required to answer questions at each of the assessment objectives
GCSE Assessment Objectives	<p>Working scientifically (WS) - Students develop their working scientifically skills so that they can fully understand the scientific process. These skills fall broadly into four main strands and exams will include questions that assess all of these strands: 1. The development of scientific thinking 2. Experimental skills and strategies 3. Analysis and evaluation 4. Vocabulary, units, symbols and nomenclature.</p> <p>Maths Skills (MS) – In Chemistry, a minimum of 20% of marks will test mathematical skills.</p> <p>Assessment Objectives (AO) - The exams will measure how students have achieved the following assessment objectives. AO1-Demonstrate knowledge and understanding of scientific ideas, scientific techniques and procedures AO2-Apply knowledge and understanding of scientific ideas, scientific enquiry, techniques and procedures AO3-Analyse information and ideas to interpret, evaluate, make judgements, draw conclusions, develop and improve experimental procedures</p>					
MAPs	MAP 1: Crude Oil & Fuels	MAP 2: Organic Chemistry (Reactions & Polymerisation) Y11 Mock Exam: Paper 1	MAP 3: Analysis & Atmosphere	MAP 4: Earth's Resources Y11 Mock Exam: Paper 2	MAP 4: Using Resources	Exam preparation and technique