

Science Year Long Term Map Chemistry y10

Subject Intent/Aims

Expose all students to a broad range of learning opportunities to deepen their knowledge and understanding of themselves and the world around them and to build a solid foundation of Science knowledge and skills. We believe in developing curiosity and understand that science is an active process with many questions to be answered and still to be asked. We provide an understanding of how knowledge was derived, discovered and came to be accepted by the scientific community. By focusing on thinking, interpreting and evaluating rather than simply memorising scientific fact we intend to enable our students to use the skills that they need to answer their own scientific questions.

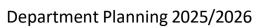
Our focus on the scientific process as a way of thinking and working will allow our students to develop their own ideas, attitudes and interpretations.

National Curriculum: Chemical changes • determination of empirical formulae from the ratio of atoms of different kinds • balanced chemical equations, ionic equations and state symbols • identification of common gases • the chemistry of acids; reactions with some metals and carbonates • pH as a measure of hydrogen ion concentration and its numerical scale • electrolysis of molten ionic liquids and aqueous ionic solutions • reduction and oxidation in terms of loss or gain of oxygen. • extraction and purification of metals related to the position of carbon in a reactivity series. GCSE Chemistry Specification Specification for first teaching in 2016 (aqa.org.uk)	Topic ENERGY CHANGES IN CHEMICAL REACTIONS National Curriculum: Energy changes in chemistry • Measurement of energy changes in chemical reactions (qualitative) • Bond breaking, bond making, activation energy and reaction profiles (qualitative). GCSE Chemistry Specification Specification for first teaching in 2016 (aqa.org.uk)	Topic QUANTITATIVE CHEMISTRY National Curriculum: quantitative interpretation of balanced equations concentrations of solutions in relation to mass of solute and volume of solvent GCSE Chemistry Specification Specification for first teaching in 2016 (aga.org.uk)	Topic RATE AND EXTENT OF CHEMICAL REACTIONS National Curriculum: Rate and extent of chemical change • factors that influence the rate of reaction: varying temperature or concentration, changing the surface area of a solid reactant or by adding a catalyst • factors affecting reversible reactions. GCSE Chemistry Specification Specification for first teaching in 2016 (aqa.org.uk)
Composition	Composition	Composition	Composition
Apply knowledge of Chemical Changes to explain how they are vital in the extraction of metals and producing salts.	understand how interactions of particles involves Energy Changes	understand Quantitative chemistry by determining the formulas for compounds and using equations for reactions.	Describe the factors affecting rate of reaction and apply understanding to measure rate of reaction
Components	Components	Components	Components











Component 1: Know oxidation and reduction in terms of loss or gain of oxygen or electrons. Component 2: Know a reactivity series of metals based on experimental results Component 3: Know products formed when molten or dissolved binary compounds are electrolysed Component 4: Know how to make soluble salts Component 5: Know the main hazards in practical contexts; plan experiments to test hypotheses; carry out experiments appropriately; describe techniques; make and record observations; present data appropriately Component 6: Know that acids produce H+ ions and can be strong or weak determined by the degree of ionisation Component 7: Know the products of acid and base reactions	Component 1: Know exothermic and endothermic changes, Component 2: use reaction profiles to describe them, Component 3: calculate theoretical energy transfers using bond energies and investigate the variables that affect the temperature changes in solutions. Component 4: Know independent, dependent and control variables; identify the main hazards in practical contexts; plan experiments to test hypotheses; carry out experiments appropriately; describe techniques; read measurements from scales; make and record observations; present data appropriately	Component 1: Know common symbols and equations. Component 2: Know relative formula masses and moles. Component 3: Know how to use moles to calculate reacting masses and to balance equations, and how to calculate theoretical and percentage yields. Component 4: Know how concentration is expressed and use this in simple titrations. Component 5: Know how to calculate gas volumes	Component 1: Know how to identify ways of speeding up reactions and use collision theory and ideas about activation energy to make predictions. Component 2:Know how to use Le Chatelier's principle to predict the effects of changing temperature, pressure and concentration on equilibrium systems whilst exploring reversible reactions. Component 3: Know how to identify variables and hazards in an investigation. Component 4: Know how to plan and carry out investigations to test different hypotheses. Component 5: Know how to recognise and describe patterns and trends in data Component 6: Know how to use models and data to make predictions and communicate findings and reasoned conclusions
Composites	Composites	Composites	Composites
Describe oxidation and reduction in terms of oxygen and electrons Predict the products of electrolysis of binary compounds Explain the stages in a method to make a soluble salt Predict the products given a set of reactants Determine the pH of solutions Classify solutions as strong or weak	Classify reactions as endothermic or exothermic based on experimental data Reproduce energy profiles with correct labels Determine the type of reaction by calculating bond energies	Convert units from g-kg etc Calculate RFM given a periodic table and chemical formula Use equations to calculate moles and masses Calculate theoretical and percentage yields given relevant data Analyse titration data to calculate the concentration of a solution	predict the effects of changing temperature, pressure and concentration on equilibrium systems whilst exploring reversible reactions use collision theory and ideas about activation energy to make predictions recognise and describe patterns and trends in data use models and data to make predictions and communicate findings and reasoned conclusions
			communicate infamigs and reasoned conclusions
Higher Order Knowledge	Higher Order Knowledge	Higher Order Knowledge Apply multiple step calculations to solve complex	Higher Order Knowledge







Department Planning 2025/2026

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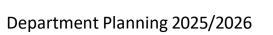
			change. The effects of changing conditions on a system at equilibrium can be predicted using Le Chatelier's Principle.
			equilibrium can be predicted using te chatener's Principle.
Key terms	Key terms	Key terms	Key terms
Rey terms			
Reactivity Series of Metals	Exothermic Reaction	Relative Atomic Mass (RAM), Ar Relative Formula Mass, Mr	Activation Energy
Oxidation	Endothermic Reaction	Mole	Enzymes
Reduction	Activation Energy	Avogadro Constant Conservation of Mass	Closed System
Displacement Reaction	Reaction Profile	Thermal Decomposition	
Redox Reaction	Bond Energy	Excess Limiting Reactant	Dynamic Equilibrium
Ore	Covalent Bond	Yield	Le Chatelier's Principle
Electrolysis	Mole	Percentage Yield	Turbidity
Electrolyte	Cell	(Atom Utilisation) Pipette	
Discharge	Battery	Burette End Point	
Anode	Electrolyte	Concordant	
Cathode	Fuel Cell		
Inert Electrodes	Anode		
	Cathode		
Final Composition/Deliberate Practice	Final Composition/Deliberate Practice	Final Composition/Deliberate Practice	Final Composition/Deliberate Practice
Required practical to make a soluble salt	Required practical investigating the effect of variables	Use a titration to determine a concentration of a known solution	Required practicals to determine rate of reaction measuring loss of reactant or product
on the energy change in a reaction			incusuming ross of reactaint of product
		Summative/Formative assessment	
Summative/Formative assessment	Summative/Formative assessment		Summative/Formative assessment
Core questions RRR to recall prior knowledge will be tested at the beginning of each lesson and self- assessed by the student. Century nuggets and PPQs LC for oxidation and reduction LC for electrolysis End of unit assessment will be marked with personalised feedback	Core questions RRR to recall prior knowledge will be tested at the beginning of each lesson and self- assessed by the student. Century nuggets and PPQs LC for energy changes End of unit assessment will be marked with personalised feedback	Core questions RRR to recall prior knowledge will be tested at the beginning of each lesson and selfassessed by the student. Century nuggets and PPQs LC for a range of calculations End of unit assessment will be marked with personalised feedback	Core questions RRR to recall prior knowledge will be tested at the beginning of each lesson and selfassessed by the student. Century nuggets and PPQs LC for rates of reactions End of unit assessment will be marked with personalised feedback End of year(mockexam) to cover all topics covered from y9 and 10







The majority of topics will give the students opportunity to develop their social skills, from



They will be taught about the need for tolerance of other people's viewpoints



Numeracy	Literacy	Numeracy	Literacy	Numeracy	Literacy	Numeracy	Literacy	
Maths skills – graphs, calculations	English – literacy skills – focusing on keywords, tier 3 vocabulary, connectives, SPAG, synonyms,	Maths skills – graphs, calculations	English – literacy skills – focusing on keywords, tier 3 vocabulary, connectives, SPAG, synonyms,	Maths skills – graphs, calculations	English – literacy skills – focusing on keywords, tier 3 vocabulary, connectives, SPAG, synonyms,	Maths skills – graphs, calculations	English – literacy skills – focusing on keywords, tier 3 vocabulary, connectives, SPAG, synonyms,	
Cross curricular links		Cross curricular links		Cross curricular links		Cross curricular links	Cross curricular links	
History: development of electricity Geography: extraction of resources from the Earth		PE use of icepacks Engineering- use of alto	alternative fuel cells Food prep: reacting proportions		History- Fritz Haber at concentration camps. Biology- Use of enzym Food technology- Use production and washi	es in reactions. of enzymes in food		
SMSC		British Value			RSHE			
learning and a range of activities The high expectations placed on the student from the school and department mean that pupils will regularly be made aware of the right and wrong morally Studen		Students will be taught the legal implications of using the internet Students will be taught to fully appreciate other students viewpoints and the importance of being respectful Students will be taught the importance of selecting valid information from reliable sources		the The student may arise. m reliable The student	The students will be taught about how to be safe online and the dangers. The students will be made aware of online relationships and the sexual issues that may arise. The students will be regularly conversed on their physical and mental health when issues arise within topics			

history of scientific discovery

Ada	apted Curriculum Content:	Adapted Curriculum Content:	Adapted Curriculum content:	Adapted curriculum content:
	quations triple and higher only ween dilution and pH higher only	Bond energy calculations limited to higher and triple. Batteries and Fuel cells triple only	Titration method and calculations triple only Atom economy and limiting reactant higher and triple only The Mole concept higher only	Finer points of the Haber process higher only Le Chatelier higher only Using tangents to calculate rate higher only

Students are taught how to contribute to life in modern Britain by learning about the

Students will learn how to display British Values to use the internet



and appreciate others in the classroom.

giving presentations to working in group tasks.





Department Planning 2024

Adaptive Implementation Practices:

Coloured paper/pens
Differentiated worksheets

Differentiated tasks

Seating plans to maximise concentration allowing for

visual/hearing impairments etc

Appropriate use of IWB

Dual coding

Spare equipment

Modelling experimental detail

Pre drawn tables/graphs/diagrams to be labelled Scaffolding for longer answer questions.

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