

Subject: Chemistry

Year 10

Scheme of Learning 2025-2026

Subject leader: Mr S Brock

Topics by term	Topic overview for Year 9					
	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Topics taught	Chemistry – C4; chemical changes L1 Acids and Alkalis L2 Strong and weak acids L3 Reactions of acids L4 Reactivity of metals L5 Metal oxides and redox L6 Redox Reaction	Chemistry – C4; chemical changes L7 Electrolysis L8 Electrolysis of metal ores L9 Electrolysis of metal solutions L10 Electrolysis of aqueous solutions practical	Chemistry – C5; energy changes L1 Energy Transfer in reactions L2 Energy Transfer in reactions practical L3 Reaction profiles L4 Energy in reactions	Chemistry – C6a; rates of reaction C6b; reversible reactions L1 L2 L3 L4 L1 L2	Chemistry – C3; quantitative chemistry	Chemistry – Recap of key skills Revision for end of year assessment
	Vital Prerequisites	Vital Prerequisites	Vital Prerequisites	Vital Prerequisites	Vital Prerequisites	Vital Prerequisites
	Knowledge of properties of acidic, alkaline and neutral substances as well as the pH scale.					

Knowledge of atoms, elements and compounds, how they are represented and being able to name them from their symbol or formula

Knowledge of what a chemical reaction is and how to represent atoms and molecules in chemical equations as well as the use of state symbols.

Understanding of what an ion is and how to represent them in a chemical equation.

Knowledge of what is meant by concentration and volume.

Knowledge of what is meant by rate of reaction and reversible reactions.

Knowledge of how to use practical equipment such as Bunsen burners, funnels, measuring cylinders, test tubes and lab safety equipment/ practices.

Exam Board AQA

Topic Big question	Lesson questions	Lesson objective	Outcomes	Key Terms Literacy Numeracy Practical activities	Assessment and homework tasks	Resources	Personal Development curriculum links (SMSC, British Values, PSHE)
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Term 1

C4 – Chemical changes

How do we know that chemical changes occur?	What is the difference between an acid and an alkali?	To be able to define an acid, alkali and an indicator, and identify the colour change of different indicators.	<ul style="list-style-type: none"> - To be able to define an acid, alkali and indicator. - To determine the colour change of different indicators in acid/neutral/alkali conditions. - To explain why some solutions are more acidic/alkaline than others due to concentration of H⁺ or OH⁻ ions. - To define a neutralisation reaction and write the general and ionic equation for neutralisation. 	Acid Alkali H ⁺ ion Indicator Neutralisation OH ⁻ ion Testing different indicators in acidic / alkali and neutral conditions, practical activity	Homework tasks linked to the lesson question. Plenary questions at the end of every lesson.	Knowledge organiser CGP textbook Lesson PowerPoint presentations	British values – respect through silence is a key aspect of the Abbey science lessons. – Students are expected to listen to, and respect others' opinions.
	What is concentration ?	To be able define and calculate concentration.	<ul style="list-style-type: none"> - To define concentration in terms of mass of solute in a solvent. - To calculate concentration when given mass and volume information. - To convert between cm³ and dm³. 	Concentration Mass Solute Solution Solvent Volume To calculate the concentration of a			

				<p>solution using mass/volume.</p> <p>To be able to convert between cm^3 and dm^3.</p>			
<p>What is the difference between a strong and weak acid? (Higher only)</p>	<p>To be able to write definitions for a strong and a weak acid, and describe differences between them.</p>	<ul style="list-style-type: none"> - To define a strong and a weak acid in terms of ionisation. - To be able to link between H^+ ion concentration and pH. - To be able to explain the differences between strong / weak and concentrated / dilute. - To describe the differences seen experimentally between a strong and weak acid. 	<p>H^+ ion</p> <p>Ionise</p> <p>pH</p> <p>Strong acid</p> <p>Weak acid</p> <p>Testing the pH, and reaction with metal of a strong and a weak acid,</p> <p>practical activity</p>				
<p>What happens when you react an acid with a metal compound?</p>	<p>To be able to write the general equation, word and symbol equations for the reactions between an acid and a metal compound.</p>	<ul style="list-style-type: none"> - To recall the formula of nitrate, sulfate and phosphate ion. - To recall the general equations for the reactions between an acid and a base (metal oxide) or a metal carbonate. - To be able to write word equations for these reactions. - To start mastering the skill of writing symbol equations. 	<p>Metal carbonate</p> <p>Metal oxide</p> <p>Nitrate</p> <p>Phosphate</p> <p>Salt</p> <p>Sulfate</p> <p>To be able to use charges on ions to calculate the correct formulae of a compound.</p>				
<p>What method is used to make</p>	<p>To be able to follow a method to make a sample of pure, dry</p>	<ul style="list-style-type: none"> - To describe how soluble salts can be made from acids by reacting them with solid insoluble substances, 	<p>Evaporating basin</p> <p>Excess</p> <p>Point of crystallisation</p> <p>Hydrochloric acid</p>				

<p>copper(II) sulfate salt? REQUIRED PRACTICAL</p>	<p>copper sulfate crystals.</p>	<p>such as metals, metal oxides, hydroxides or carbonates.</p> <ul style="list-style-type: none"> - To make pure, dry crystals of copper(II) sulfate. - To write a detailed method, and be able to explain each step, such as why excess solid is added to the acid. 	<p>Copper oxide Copper(II) sulfate</p> <p>To be able to make pure, dry copper (II) sulfate crystals, practical activity.</p>			
<p>How can you tell if one metal is more reactive than another?</p>	<p>To be able to describe the properties of metals and understand the reactivity series.</p>	<ul style="list-style-type: none"> - To describe properties that are common to all metals. - To match the properties of metals to their uses. - To be able to predict the order of reactivity of metals from observations. - To understand that the reactivity series is a list of metals in order of reactivity, with carbon and hydrogen also in the list. 	<p>Ductile Lustrous Malleable Reactivity series Sonorous</p> <p>To be able to react four different metals with acid and use observations from the reactions to predict their order of reactivity, practical activity.</p>			
<p>How can metals be extracted from their ores?</p>	<p>To be able to explain the process of reduction by carbon, and be able to determine whether it would be a suitable method to use based on the metal's position in the reactivity series.</p>	<ul style="list-style-type: none"> - To be able to define the words oxidation and reduction in terms of addition / removal of oxygen. - To determine whether a metal could be extracted using reduction by carbon based on its position in the periodic table. - To write word (and symbol) equations for reduction by carbon reactions. 	<p>Ore Oxidation Reduction</p>			

			- To describe the process of extracting iron by the method of reduction by carbon.				
	What is a redox reaction? (Higher only)	To be able to define what a redox reaction is, and to write symbol / ionic and half-equations for the reactions.	<ul style="list-style-type: none"> - To be able to define oxidation and reduction in terms of gaining or losing electrons (OILRIG). - To be able to define what a redox reaction is. - To write symbol equations for redox reactions. - To be introduced to ionic and half-equations. 	Half equation Ionic equation Oxidation Reduction Redox			

Term 2

C4 – Chemical changes

How do we know that chemical changes occur?	What is electrolysis?	To be able to describe the process of electrolysis in molten ionic compounds and predict what the properties would be at each electrode.	<ul style="list-style-type: none"> - To define the terms electrolysis and electrolyte, and be able to identify the positive and negative electrodes as the anode and cathode. - To understand that electrolysis occurs with molten or aqueous ionic compounds. - To understand that the ions move to the oppositely charged electrode. - To predict the products at the anode and cathode for molten ionic compounds. - To describe what the observations would be at each electrode. 	Anode Anion Cathode Cation Electrode Electrolysis Electrolyte	Termly assessment focused on C4 content. Homework tasks linked to the lesson question. Plenary questions at the end of every lesson.	Knowledge organiser CGP textbook Lesson PowerPoint presentations	British values – respect through silence is a key aspect of the Abbey science lessons. – Students are expected to listen to, and respect others' opinions.
	How can metal be extracted from an ore	To be able to describe the process of extracting aluminium from	<ul style="list-style-type: none"> - To describe the stages of extracting aluminium from molten aluminium oxide. 	Anode Anion Cathode			

using electrolysis? <i>(Some higher content)</i>	aluminium oxide using electrolysis.	<ul style="list-style-type: none"> - To explain what products form at the anode and cathode. - To explain why the anode eventually needs to be replaced. - <i>To write half-equations for the reactions happening at the anode and cathode.</i> 	Cation Cryolite Electrode Electrolysis Electrolyte			
What products occur from the electrolysis of aqueous solutions? <i>(Some higher content)</i>	To be able to describe the process of electrolysis in aqueous ionic compounds and predict what the properties would be at each electrode.	<ul style="list-style-type: none"> - To understand the difference between molten and aqueous substances. - To state that aqueous solutions also contain H^+ and OH^- ions which come from the water molecules. - To be able to predict whether hydrogen or the metal will be produced at the cathode and explain why. - <i>To write half-equations for the reactions happening at the anode and cathode.</i> 	Anode Anion Aqueous Cathode Cation Electrode Electrolysis Electrolyte			
How can electrolysis separate an ionic compound? REQUIRED PRACTICAL	To be able to investigate the electrolysis of an aqueous solution.	<ul style="list-style-type: none"> - To predict what the products formed will be at the anode and cathode for the electrolysis of aqueous sodium chloride. - To match observations to predictions to identify the products formed. 	Anode Anion Aqueous Cathode Cation Electrolysis Electrolyte To use electrolysis to separate aqueous sodium chloride, practical activity.			

Term 3

C5 – energy changes

<p>How does energy change during a chemical reaction ?</p>	<p>How is energy transferred in a reaction?</p>	<p>To be able to define endo- and exothermic reactions and be able to determine which type of reaction occurs based on experimental data.</p>	<ul style="list-style-type: none"> - To define the terms endothermic and exothermic. - To identify examples of each type of reaction. - To use temperature changes to distinguish between endo- and exothermic reactions. 	<p>Energy Endothermic Exothermic Temperature change</p> <p>To be able to calculate temperature change from an initial and final temperature reading.</p>	<p>Termly assessment focused on energy changes.</p> <p>Homework tasks linked to the lesson question.</p> <p>Plenary questions at the end of every lesson.</p>	<p>Knowledge organiser</p> <p>CGP textbook</p> <p>Lesson PowerPoint presentations</p>	<p>British values – respect through silence is a key aspect of the Abbey science lessons.</p> <p>– Students are expected to listen to, and respect others’ opinions.</p>
	<p>How can we investigate if a reaction is endothermic or exothermic? REQUIRED PRACTICAL</p>	<p>To be able to follow a method to determine whether certain reactions are endo- or exothermic.</p>	<ul style="list-style-type: none"> - To use a pre-written method to identify the variables of the experiment, write a risk assessment and a hypothesis. - To record initial and final temperature of three separate reactions to determine if they are endo- or exothermic. - To calculate temperature change and use this to identify if the reactions are endo-or exothermic. - To draw valid conclusions and evaluate the method used. - To discuss another method in which concentrations of acid are changed. 	<p>Energy Endothermic Exothermic Temperature change</p> <p>To be able to calculate temperature change from an initial and final temperature reading.</p> <p>To determine whether reactions are endo-or exothermic, practical activity.</p>			

	How can we represent a reaction as endo-or exothermic?	To be able to draw reaction profile diagrams to represent endo- and exothermic reactions.	<ul style="list-style-type: none"> - To draw reaction profile diagrams for endo- and exothermic reactions. - To define activation energy and be able to label it on the reaction profiles. - To define ΔH and be able to label it on the reaction profiles. 	Activation energy Energy Endothermic Exothermic ΔH Reaction profile diagram			
	How can we calculate energy change in a reaction? (Higher only)	To be able to calculate ΔH for a reaction.	<ul style="list-style-type: none"> - To identify the bonds broken and formed during a reaction. - To understand why a reaction will be endo- or exothermic overall. - To use bond energies to calculate ΔH. 	Activation energy Energy Endothermic Exothermic ΔH Reaction profile diagram To be able to calculate ΔH for a reaction using bond energy information.			

Term 4

C6a – Rates of reaction

Why do reactions occur at different rates and how can we measure this?	What factors affect the rate of reaction?	To be able to explain how the factors temperature, concentration, pressure, surface area and adding a catalyst affect the rate of a reaction.	<ul style="list-style-type: none"> - To understand collision theory. - To explain how increasing temperature, concentration, pressure and surface area all increase the reaction rate due to more frequent collisions between reactant particles. - To explain how a catalyst speeds up the rate of a reaction by providing an alternative pathway of lower activation energy. 	Catalyst Concentration More frequent collisions Pressure Rate Surface area Temperature	End of topic assessment covering rates of reaction and reversible reactions. Homework tasks linked to the lesson question.	Knowledge organiser CGP textbook Lesson PowerPoint presentations	SMSC – Why is having a knowledge of the rate of reaction important in terms of profit, but also environmental concerns?
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			<ul style="list-style-type: none"> - To show activation energy of a catalysed, and uncatalysed reaction on a reaction profile diagram. 		Plenary questions at the end of every lesson.	British values – respect through silence is a key aspect of the Abbey science lessons. – Students are expected to listen to, and respect others' opinions.
How can we measure the rate of a reaction?	To be able to describe what experimental methodology should be used to calculate the rate of a reaction based on the products formed.	<ul style="list-style-type: none"> - To describe the experimental set-up for calculating the rate of a reaction in which a gas is produced as a product. - To describe the experimental set-up for calculating the rate of a reaction in which a mass is lost. - To describe the experimental set-up for calculating the rate of a reaction in which a precipitate is formed. 	<p>Rate of reaction</p> <p>To calculate the rate of a reaction using the equation: Rate = mass or volume of product / time.</p>			
How can we determine the rate of a reaction graphically? <i>(Some higher content)</i>	To be able to describe how the rate of a reaction changes over time and label these points on a graph.	<ul style="list-style-type: none"> - To sketch the graphs of product formed over time, and reactants used over time. - To understand that the steeper the gradient, the faster the rate of reaction. - To use a graph to calculate the mean rate of a reaction. - <i>To use a graph to calculate the rate of reaction at a particular time point using a tangent.</i> 	<p>Gradient Tangent</p> <p>To calculate the mean rate of a reaction using a graph.</p> <p><i>To calculate the rate of reaction at a particular time point by drawing a tangent to the curve and calculating the gradient.</i></p>			
How does changing concentration affect the rate of reaction? REQUIRED PRACTICAL	To be able to investigate how changes in concentration affect the rates of reactions by a method involving measuring the volume of gas produced and a	<ul style="list-style-type: none"> - To use a pre-written method to identify the variables of the experiment, write a risk assessment and a hypothesis. - To record volume of gas collected over time using a suitable method and plot a graph of results. - To record time taken for cross to disappear in second experiment. 	<p>Precipitate Turbidity</p> <p>To investigate how changing the concentration of a reactant affects the rate</p>			

		method involving a change in turbidity.	- To draw valid conclusions and evaluate the methods used.	of reaction, practical activity .			
C6a – Reversible reactions							
How can we change chemical reactions?	What is a reversible reaction?	To be able to define a reversible reaction and explain how it will eventually reach equilibrium.	- To understand what a reversible reaction is. - To define a closed system. - To explain how a reversible reaction eventually reaches equilibrium.	Closed system Equilibrium Reversible			SMSC – Why is it useful to manipulate reactions in terms of profit, but also environmental concerns?
	What happens if the conditions of a reversible reaction are changed? (Higher only)	To be able to define Le Chatelier's principle, and use it to determine whether the yield of product will increase or decrease.	- To define Le Chatelier's principle. - To explain what happens to a system in equilibrium if the temperature, pressure or concentration of one of the reactants changes. - To predict what will happen to the yield of a product.	Le Chatelier's principle Position of equilibrium Yield			
Term 5							
C3 – Quantitative chemistry							
How can we use mass to calculate the mass of a compound and the concentration of a solution? (FOUNDATION)	What happens to the mass during a reaction?	To be able to define the 'Law of conservation of mass' and explain why it doesn't appear to be met in some situations.	- To define the 'Law of conservation of mass'. - To understand what the 'big numbers' in an equation mean. - To understand that some reactions may appear to gain or lose mass, but, it has been conserved. - To be able to explain why a reaction appears to gain or lose mass.	Law of conservation of mass Reactants Products To calculate the total mass of reactants and products To investigate the mass of reactants and products in three different reactions	End of topic assessment focused on quantitative chemistry. Homework tasks linked to the lesson question.	Knowledge organiser CGP textbook Lesson PowerPoint presentations	British values – respect through silence is a key aspect of the Abbey science lessons. – Students are expected to listen to, and

What is a mole and how do we calculate it? (HIGHER)	How do we calculate the mass of a compound?	To be able to calculate the relative formula mass of any compound.	<ul style="list-style-type: none"> - To define relative atomic mass and relative formula mass. - To use relative atomic masses to calculate the relative formula mass of any compound. 	to see if the Law has been upheld, practical activity. Relative atomic mass Relative formula mass To calculate the relative formula mass of any compound.	Plenary questions at the end of every lesson.		respect others' opinions.
	What is a mole of a compound? (Higher only)	To be able to describe the bonding in metals and explain how the properties of a metal are linked to its structure.	<ul style="list-style-type: none"> - To know that the amount of substance is measured in moles - To state Avogadro's number as 6.02×10^{23}. - To calculate the amount of moles of a substance using its mass in grams. - To calculate the amount of moles of a substance using its amount in moles. 	Avogadro's number Mole To calculate the amount of substance in moles using the equation: Moles = mass / Mr.			
	How can I balance an equation using masses? (Higher only)	To be able to use masses to balance an equation, and also to calculate the mass of another part of the equation.	<ul style="list-style-type: none"> - To recall how to calculate number of moles of a compound using its mass in grams. - To convert the masses of reactants and products in a chemical equation into numbers of moles, convert numbers of moles into whole number ratios and use this to balance the equation - To use relative atomic and formula masses to calculate the mass of all 	Molar ration Mole Product Reactant Relative atomic mass Relative formula mass To use the masses of reactants and products to balance an equation.			

		<p>the substances in a balanced chemical equation.</p> <ul style="list-style-type: none"> - To use molar masses to calculate the masses of reactants and products from balanced symbol equations, given the mass of one reactant or product. - To use molar masses to calculate the mass of a reactant or product from a balanced symbol equation. 	<p>To use the mass of one part of the reaction to calculate another.</p>			
<p>What determines the final mass of product in a reaction? (Higher only)</p>	<p>To be able to explain what a limiting reactant is and use it to calculate the total mass of product formed.</p>	<ul style="list-style-type: none"> - To define the term limiting reactant. - To explain how the limiting reactant affects the total product made. - To calculate the number of moles of both reactants and determine which one is limiting. - To use the limiting reactant to calculate the mass of the product. 	<p>Limiting reactant Product Reactant</p> <p>To use the mass of both reactants to determine which one is limiting. To use the limiting reactant to calculate total mass of product formed.</p>			
<p>How do we calculate concentration of a solution?</p>	<p>To be able to define what concentration is and be able to calculate it.</p>	<ul style="list-style-type: none"> - To state and explain the meaning of concentration and the unit grams per dm³ - To understand that the concentration of a solution depends on the mass of solute present and the volume of the solution. - To calculate the mass of solute in a given volume of solution of known concentration in terms of mass per given volume of solution 	<p>Concentration Grams per dm³ solute solution solvent</p> <p>To calculate the concentration of a solution using the equation: Concentration = mass / volume.</p>			

Term 6

Revision

Term 6 is set aside to:

- Recap difficult concepts from the year including electrolysis, and rates of reaction.
- Revise key skills such as balancing equations.
- Recap the required practical activities covered this year and in year 9.
- Revision of other aspects of the course ahead of end of year assessments.