MOOR PARK HIGH SCHOOL: CURRICULUM

Long Term Planning

Year 10 Trilogy

Curriculum Area: Chemistry

Year 10	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Syllabus	AQA Chemistry ARK Curriculum 4.1 Structure and Bonding	AQA Chemistry Ark Curriculum 4.2 Extraction of Metals	AQA Chemistry ARK Curriculum 4.3 Quantitative Chemistry		AQA Chemistry ARK Curriculum 4.4 Energy Changes	
Connections to prior KS3 learning	Atomic structure Electronic configuration Elements, Compounds and Mixtures Physical and chemical changes and reactions The Property of elements in the periodic table covalent bonds Numbers in standard form Property of Metals and Non-metals Specific heat capacity The percentage mass of an element	Relative atomic and formula mass Reaction of metals and oxygen Reduction and Oxidation The law of conservation of mass Ions and the periodic table Formation of Copper Sulphate crystals Chemical test for Hydrogen and carbon dioxide measurement uncertainty Definitions of solute, solvent and solution, concentration and Volume Conversion of units dm^3 ,cm3 and L Earth's resources include, shelter, food and transport, warmth, timber, clothing and fuels. Sustainable development including recycling	Relative atomic mass, formula mass and percentage mass Recognise and use expressions in standard form. Atoms and Atomic structure measurement uncertainty Definitions of solute, solvent and solution, concentration and Volume Conversion of units dm^3 ,cm3 and L The law of conservation of mass Subscript coefficient number Balancing equation Reactions of metals and acids Neutralisation		Physical and Chemical Reactions Relative atomic and formula mass Photosynthesis as an endothermic reaction . Factors affecting Photosynthesis Respiration as an exothermic reaction energy needed for living process Aerobic respiration Elements, Compounds and mixtures	
Knowledge	Ionic Bonding Properties of Ionic Substances Covalent Bonding	Extracting Less Reactive Metals Ions, Ionic Bonding and Deducing Ionic Formulae	(HT) Introducing the Mole (HT) Calculating moles Concentration		Exothermic and Endothermic Reactions Energy in Chemical Reactions (HT) Bond Energy	

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	Properties of Covalent Substances Diamond Graphite Graphene, Fullerenes and Nanotubes Polymers Metallic Bonding Alloys Bonding Review Evaluating Bonding Models	HT only: Ionic Equations and Displacement Reactions HT only: Writing Half Equations HT: Ionic Equations for the Reactions of Acids and Metals Introduction to Electrolysis Extracting Metals by Electrolysis Electrolysis of Molten Ionic Compounds Electrolysis in Solutions Required Practical: The Electrolysis of Aqueous Solutions (HT) Obtaining Raw Materials Recycling Metals	Taking it Further: Calculating Concentration (HT) Amounts of Substances in Equations (HT) Limiting Reactants Prior Knowledge Review: Acid Reactions Acids, Alkalis and Neutralisation (HT) Strong and Weak Acicds	Investigating Temperature Change
Skills	Recognise, draw and interpret diagrams Describe a practical procedure for a specified purpose Make predictions or calculate quantities based on a model or show its limitations Include a coherant and sensible order of steps, with sufficient detail to obtain valid results, including suggested equipment Measuring the density of an irregularly shaped object. models to represent data, events, proceses, behaviours and other scientific phenomena, Evaluate the strengths and limitations of a model	Use of appropriate qualitative reagents and techniques to analyse and identify unknown samples or products including gas tests, flame tests, precipitation reactions, and the determination of concentrations of strong acids and strong alkalis Use of appropriate apparatus and techniques to draw, set up and use electrochemical cells for separation and production of elements and compounds Describe, suggest or select the technique, instrument, apparatus or material that should be used for a particular purpose, and explain why Suggest a hypothesis to explain given observations or data.	Measurement error including random and systematic error Analyse and identify unknown samples or products including gas tests, flame tests, precipitation reactions, and the determination of concentrations of strong acids and strong alkalis Preparation of a pure dry sample of a soluble salt evaluate data to suggest improvements to procedures and techniques. Apply the idea that whenever a measurement is made, there is always some uncertainty about the result obtained. Use the range of a set of measurements about the mean as a measure of uncertainty	Use models to represent data, events, processes, behaviours and other scientific phenomena, including Recognise, draw and interpret diagrams. Translate from data to a representation with a model. Use models in explanations, or match features of a model to the data from experiments or observations. Suggest a hypothesis to explain given observations or data. Explain why a certain hypothesis was chosen, with reference to scientific theories and explanations. Describe, suggest, or select the technique, instrument, apparatus, or

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	Recognise that scientific models and theories change over time	Explain why a certain hypothesis was chosen, with reference to scientific theories and explanations Describe and evaluate, with the help of data, methods that can be used to tackle problems caused by human impacts on the environment.		material that should be used for a particular purpose, and explain why. Assess whether sufficient, precise measurements have been taken in an experiment. Evaluate methods with a view to determining whether or not they are valid.
Assessment	End of unit test	End of unit test	End of unit test	End of unit test
Homework	GCSE past paper exam questions Analysis / Evaluation of investigations Extended answer questions			
Cultural enrichment including Trips, Visits, Experiences, Extra-curricular	During the course of the academic year, Year 10 students will attend the University of Central Lancashire. This visit will enable students to: Explore Advanced Scientific Concepts: Students will have the opportunity to engage with scientific research and technology, enhancing their understanding of key topics covered in their science curriculum. Hands-On Learning: Through interactive workshops and laboratory sessions, students will apply theoretical knowledge in practical settings, fostering a deeper comprehension of scientific principles. Inspiration and Aspiration: Exposure to a university environment and interaction with university faculty and students will inspire Year 9 pupils to consider future educational and career paths in science and related fields. Curriculum Integration: The visit is designed to complement and enrich the current science curriculum, providing real-world context to classroom learning and helping students see the relevance of their studies. This experience aims to ignite a passion for science, encourage critical thinking, and support the academic growth of our students.			
Literacy	Keywords that students may find difficult: Ion, empirical formula, ionic, lattice, electrostatic force, Covalent, Displayed formula, intermolecular	Keywords that students may find difficult: Displacement, Oxidation, Reduction, Pure, Ore Extracted, Reduction, Displacement, Ion, Ionic	Keywords that students may find difficult: Relative atomic mass,relative formula mass	Keywords that students may find difficult: Acid , Alkaline, Battery, Catalyst, Concentration, Electrode, Electrolyte, Half equation, Mole, Molecule,

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	forces, simple covalent, giant covalent, Diamond, Giant covalent, graphite, lubricant, electrode, graphene,Fullerene, hexagonal, nanotube, nanotechnology, tensile strength, fullerene, Nanoparticle, Nano, Catalyst, Surface area, Surface area:Volume ratio, Polymer, Monomer, Thermosoftening, Thermosetting, sonorous, ductile Malleable, electronic configuration, ion, stable, alloy, giant structure, pure, carat, bronze, brass, Metallic, Ionic Covalent, Electrostatic, Dot-and-cross, Ball-and-stick, Lattice, Empirical formula	Empirical formula, Electron, Oxidation, Reduction Ionic equation, Redox, Half Equation, Electron, ionic equation, hydrochloric acid, nitric acid sulfuric acid, Discharged, Anode, Cathode, Electrolysis, Electrolyte, Molten, Extraction, Electrolyte, Discharged, Anode, Cathode, , Electroplating, Corrosion, Rusting Bioleaching, Leachate, Low-grade ore, Recycling, Sustainable	percentage by mass, mole, mass, amount, relative formula mass, , mole, volume, concentration, solute, solution, mass, volume, concentration, moles, solution, mass, volume, concentration, mass, limiting reactant, acid, base, alkali, neutralisation, chemical formula, hydrogen ion, hydroxide ion, titration, , pressure temperature.	Neutralisation, Product, Reactant, Relative formula mass Activation energy, Atom economy, Bond energy, Chemical cell, Endothermic, Exothermic, Fuel cell, Percentage yield, Reaction profile, Rechargeable, Reversible reaction, Theoretical
Numeracy	Understand the terms mean, mode and median Use SI units Use prefixes and power of 10 for orders of magnitude (e.g. tera, giga, mega, kilo, centi, milli, micro and nano.) Interconvert units. Recognise and use expressions in decimal form. Recognise and use expressions in standard form Use percentages	Apply the idea that whenever a measurement is made, there is always some uncertainty about the result obtained. Use the range of a set of measurements about the mean as a measure of uncertainty." Interconvert units. Relate derived quantities with the formulae to calculate those quantities	Apply the idea that whenever a measurement is made, there is always some uncertainty about the result obtained. Use the range of a set of measurements about the mean as a measure of uncertainty. Understand the terms mean, mode and median Understand the terms mean, mode and median Interpret the reliability of sources of information.	Use an appropriate number of significant figures. Recognise and use expressions in decimal form. Recognise the importance of scientific quantities and understand how they are determined.

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	Construct and interpret bar charts, pie charts and histograms Decide on a suitable scale for the x and y-axis when drawing a graph Interpret a line (scatter) graph Calculate percentage increase or decrease.		Use SI units (eg kg, g, mg; km, m, mm; kJ, J) Measure volumes of liquids accurately Relate derived quantities with the formulae to calculate those quantities	
CIAG	What workplace skills does chemistry develop? Collating: Bringing together information from different sources is a useful skill in many jobs. An investigative journalist will need to find evidence from a range of sources to build a story. Software testers need to collate information about the performance of a programme to find issues and suggest appropriate improvements. Investigation: There are many jobs where you have to use these investigative skills. A forensic computer analyst investigates cyber crime to find out how breaches happen. A vet must investigate the causes of illness in an animal by looking at the symptoms and then deciding on a treatment. Critical evaluation: Critical evaluation is a skill that transfers to many jobs. If you work as a crown prosecutor, you'll have to evaluate criminal cases and decide whether the evidence is likely to lead to a conviction. In business, managers need to carry out regular performance evaluations with the members of their team and identify areas for improvement.			

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Year 11 Trilogy

Curriculum Area: Chemistry

Year 11	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1
Syllabus	AQA Chemistry Collins - Chapter 6 The rate and extent of Chemical Reactions	AQA Chemistry Collins - Chapter 8 Chemical Analysis	AQA Chemistry Collins - Chapter 9 The Atmosphere	AQA Chemistry Collins - Chapter 10 Sustainable Development	
Connections to prior KS3 learning	chemical symbols and formulae for elements and compounds Conservation of mass changes of state and chemical reactions. Chemical reactions as the rearrangement of atoms Representing chemical reactions using formulae and using equations What catalysts do. The order of metals and carbon in the reactivity series	the concept of a pure substance mixtures, including dissolving simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography the identification of pure substances	The composition of the Earth The structure of the Earth The rock cycle and the formation of igneous, sedimentary and metamorphic rocks The carbon cycle The composition of the atmosphere The production of carbon dioxide by human activity and the impact on climate	The composition of the Earth The structure of the Earth The carbon cycle The composition of the atmosphere The production of carbon dioxide by human activity and the impact on climate	
Knowledge	Rate of reaction Factors which affect the rates of chemical reactions Reversible reaction systems at equilibrium Catalysts	Purity, formulations and chromatography Identification of common gases	The composition and evolution of the Earth's atmosphere Carbon dioxide and methane as greenhouse gases Common atmospheric pollutants and their sources	Using the Earth's resources and obtaining potable water Life cycle assessment and recycling Sustainable development	

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			Carbon footprint and its reduction		
Skills	use appropriate apparatus to explore chemical changes Plan investigations, make observations and analyse data Record the results and plot a graph of results of volume of gas against time. Predict and explain the effects of changes in the size of pieces of a reacting solid in terms of surface area to volume ratio. investigate how changes in concentration affect the rates of reactions by a method involving measuring the volume of a gas produced and a method involving a change in colour or turbidity.	Plan investigations, make observations and analyse data Evaluate the reliability of data investigate how paper chromatography can be used to separate and tell the difference between coloured substances. Students should calculate Rf values. use of chemical tests to identify the ions .	observations and analysis of data	Plan investigations, make observations and analyse data Analysis and purification of water samples from different sources, including pH, dissolved solids and distillation. use of appropriate apparatus to make and record a range of measurements accurately including mass safe use of appropriate heating devices and techniques including use of a Bunsen burner and a water bath or electric heater use of appropriate apparatus and techniques for the measurement of pH in different situations	
Assessment	End of unit test for Chapter 6 - The rate and extent of Chemical Reactions	End of unit test for Chapter 8 Chemical Analysis	End of unit test for Chapter 9 The Atmosphere	End of unit test for Chapter 10 Sustainable Development -	
Homework	GCSE past paper exam questions Analysis / Evaluation of investigations				

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	Extended answer questions				
Literacy	Keywords: Activation energy, Catalyst, Collision theory, Equilibrium, Pressure, temperature, concentration, collisions, kinetic energy, activation energy, Equilibrium, Le Chatelier's Principle, Rate of reaction, Reversible reaction	Keywords: Chromatogram, Chromatography, *Flame emission spectroscopy, *Flame test, Impure substance, *Instrumental methods, Litmus paper, Mobile phase, Precipitation, Pure substance, Rf value, Stationary phase	Keywords: Acid rain, Carbon footprint, Environmental implication, Fossil fuels, Global climate change, Global dimming, Greenhouse effect, Greenhouse gases, Particulates, Photosynthesis, Pollutants	Keywords: *Alloy, Bioleaching, *Borosilicate glass, *Composite, *Corrosion, Desalination, Displacement, Electrolysis, *Electroplating, Finite resources, *Galvanise, Ground water, Life cycle assessment (LCA), *NPK fertilisers, Ore, Phytomining, Potable water, Raw materials, Renewable resources, *Sacrificial protection, *Soda-lime glass, Sterilisation, Sustainable development, *The Haber process, Thermosetting polymers, Thermosoftening polymers	
Numeracy	Use the results and graph to determine the mean rate of reaction. Calculate the mean rate of a reaction from given information about the quantity of a reactant used or the quantity of a product formed and the time taken. Draw and interpret graphs showing the quantity of product	Suggest the effects on Earth and atmosphere of the carbon footprint Draw pie charts for the composition of the atmosphere Use the equation for photosynthesis	Extract and interpret information about resources from charts, graphs and tables. Use orders of magnitude to evaluate the significance of data.	Balancing chemical equations	

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	formed or quantity of reactant used up against time. Use simple ideas about proportionality when using collision theory to explain the effect of a factor on the rate of a reaction.				
CIAG	What workplace skills does chemistry develop? Collating: Bringing together information from different sources is a useful skill in many jobs. An investigative journalist will need to find evidence from a range of sources to build a story. Software testers need to collate information about the performance of a programme to find issues and suggest appropriate improvements. Investigation: There are many jobs where you have to use these investigative skills. A forensic computer analyst investigates cyber crime to find out how breaches happen. A vet must investigate the causes of illness in an animal by looking at the symptoms and then deciding on a treatment. Critical evaluation: Critical evaluation is a skill that transfers to many jobs. If you work as a crown prosecutor, you'll have to evaluate criminal cases and decide whether the evidence is likely to lead to a conviction. In business, managers need to carry out regular performance evaluations with the members of their team and identify areas for improvement.				