MOOR PARK HIGH SCHOOL: CURRICULUM

Key Stage 4 Long Term Planning

Year 10

Curriculum Area: Chemistry Trilogy Science

Year 10	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Syllabus	AQA Chemistry Collins - Chapter 4 Chemical Changes		AQA Chemistry Collins - Chapter 3 Chemical Quantities and calculations	AQA Chemistry Collins - Chapter 5 Energy Changes	AQA Chemistry Collins - Chapter 6 The rate and extent of Chemical Reactions	AQA Chemistry Collins - Chapter 7 Hydrocarbons
Connections to prior KS3 learning	Chemical symbols and formulae for elements and compounds Mixtures, including dissolving Simple techniques for separating mixtures: filtration, evaporation, distillation and chromatography Combustion, thermal decomposition, oxidation and displacement reactions Defining acids and alkalis in terms of neutralisation reactions. The pH scale for measuring acidity/alkalinity; and indicators		Chemical symbols and formulae for elements and compounds Conservation of mass Pure and impure substances The concept of a pure substance The identification of pure substances. Chemical reactions as the rearrangement of atoms Representing chemical reactions using formulae and using equations Investigate changes in mass for chemical and physical processes	Energy changes on changes of state (qualitative) Exothermic and endothermic chemical reactions (qualitative)	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 order of metals and carbon in the reactivity series The use of carbon in obtaining metals from metal oxides Properties of ceramics, polymers and composites (qualitative).

MOOR PARK HIGH SCHOOL: CURRICULUM

	Reactions of acids with metals to produce a salt plus hydrogen The order of metals and carbon in the reactivity series The use of carbon in obtaining metals from metal oxides				
Knowledge	Reactivity of metals Extraction of metals Oxidation and reduction reactions Reactivity of acids Neutralization reactions Electrolysis Predicting the products, using common reactants	The law of conservation of mass relative atomic mass relative formula mass Change in mass Use of amount of substance in relation to masses of pure substances Chemical equations can be interpreted in terms of moles Limiting reactants	Exothermic and endothermic reactions Reaction profiles	Rate of reaction Factors which affect the rates of chemical reactions Reversible reaction systems at equilibrium Catalysts	Carbon compounds as fuels Fractional Distillation Combustion Cracking and Alkenes
Skills	safe use of a range of equipment to purify and/or separate a chemical mixture including evaporation, filtration and crystallisation safe use and careful handling of gases, liquids and solids, including careful mixing of reagents under	Plan investigations, make observations and analyse data Explain what has happened to the mass during the experiment and why it has happened.	making and recording appropriate observations during chemical reactions including changes in temperature safe and careful handling of gases, liquids and solids, including careful mixing of reagents under controlled	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	Plan investigations, make observations and analyse data Plot boiling points of alkanes against number of carbons. Make predictions of the boiling points of other alkanes. Research uses of the fractions of crude oil.

MOOR PARK HIGH SCHOOL: CURRICULUM

	controlled conditions, using appropriate apparatus to explore chemical changes and/or products use of appropriate apparatus and techniques for conducting and monitoring chemical reactions including appropriate reagents and/or techniques for the measurement of pH in different situations preparation of a pure, dry sample of a soluble salt from an insoluble oxide or carbonate using a Bunsen burner to heat dilute acid and a water bath or electric heater to evaporate the solution		conditions, using appropriate apparatus to explore chemical changes and/or products Investigate the variables that affect temperature changes in reacting solutions displacement of metals. Draw simple reaction profiles (energy level diagrams) for exothermic and endothermic reactions	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.	
Assessment	End of unit test for Chapter 4 - Chemical Changes	End of unit test for Chapter 3 - Chemical Quantities and calculations	End of unit test for Chapter 5 - Energy Changes	End of unit test for Chapter 6 - The rate and extent of Chemical Reactions	End of unit test for Chapter 7 - Hydrocarbons
Homework	GCSE past paper exam questions Analysis / Evaluation of investigations Extended answer questions	GCSE past paper exam questions Analysis / Evaluation of investigations Extended answer questions	GCSE past paper exam questions Analysis / Evaluation of investigations Extended answer questions	GCSE past paper exam questions Analysis / Evaluation of investigations Extended answer questions	GCSE past paper exam questions Analysis / Evaluation of investigations Extended answer questions

MOOR PARK HIGH SCHOOL: CURRICULUM

Cultural enrichment including Trips, Visits, Experiences, Extra-curricular	**School and University Network** Summer Term-UCLAN Visit (Topic to be confirmed)				
Literacy	Keywords: Acid, Alkali, Crystallisation, Displacement, Electrolysis, Electrolyte, Extraction, Filtration, Negative electrode (cathode), Neutralisation, Oxidation, pH scale, Positive electrode (anode), Reduction, Universal indicator,	Keywords: *Actual yield, Concentration, Conservation of mass, Limiting reactant, *Mole, *Percentage by mass, *Percentage yield, Relative formula mass, *Theoretical yield, Thermal decomposition, Uncertainty	Keywords: Activation energy, Battery, Endothermic reaction, Exothermic reaction, Reaction profile,	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: Alcohols, Alkanes, Alkenes, unsaturated, Carboxylic acids, Catalytic cracking, Combustion, Complete combustion, Crude oil, Cracking, DNA, Esters, Fermentation, Fractional distillation, Hydrocarbons, Polymers, Polypeptide, Steam cracking
Numeracy	Using common reactants, predict the products Deduce an order of reactivity of metals Interpret or evaluate specific metal extraction processes when given appropriate information. Explain reactions in terms of gain or loss of electrons Explain what happens at the following electrodes using suitable examples and half equations:	Balancing chemical equations Define one mole in terms of Mr and Ar Be able to convert cm_3 into dm_3. Rearrange the equation: C = m / v to make mass the subject.	Measurements of temperature change Draw simple reaction profiles (energy level diagrams) for exothermic and endothermic reactions Be able to calculate the energy transferred in chemical reactions	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 formed or quantity of reactant used up against time.	Write balanced symbol equations

MOOR PARK HIGH SCHOOL: CURRICULUM

	cathode anode.			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.				

MOOR PARK HIGH SCHOOL: CURRICULUM

Key Stage 4 Long Term Planning

Year 11

Curriculum Area: Chemistry Trilogy Science

Year 11	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1
Syllabus	AQA Chemistry Collins - Chapter 8 Chemical Analysis	AQA Chemistry Collins - Chapter 9 The Atmosphere	AQA Chemistry Collins - Chapter 10 Sustainable Development	AQA Chemistry Collins - Chapter 3 Chemical Quantities and calculations	
Connections to prior KS3 learning	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	Chemical symbols and formulae for elements and compounds Conservation of mass Pure and impure substances The concept of a pure substance The identification of pure substances. Chemical reactions as the rearrangement of atoms Representing chemical reactions using formulae and using equations Investigate changes in mass for chemical and physical processes	
Knowledge	Purity, formulations and chromatography Identification of common gases	The composition and evolution of the Earth's atmosphere	Using the Earth's resources and obtaining potable water	The law of conservation of mass relative atomic mass	

MOOR PARK HIGH SCHOOL: CURRICULUM

		Carbon dioxide and methane as greenhouse gases Common atmospheric pollutants and their sources Carbon footprint and its reduction	Life cycle assessment and recycling Sustainable development	relative formula mass Change in mass Use of amount of substance in relation to masses of pure substances Chemical equations can be interpreted in terms of moles Limiting reactants	
Skills	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	Plan investigations, make observations and analyse data Explain what has happened to the mass during the experiment and why it has happened.	
Assessment	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 -	End of unit test for Chapter 3 - Chemical Quantities and calculations	

MOOR PARK HIGH SCHOOL: CURRICULUM

Homework	GCSE past paper exam questions Analysis / Evaluation of investigations Extended answer questions	GCSE past paper exam questions Analysis / Evaluation of investigations Extended answer questions	GCSE past paper exam questions Analysis / Evaluation of investigations Extended answer questions	GCSE past paper exam questions Analysis / Evaluation of investigations Extended answer questions	
Cultural enrichment including Trips, Visits, Experiences, Extra-curricular	**<u>School and University Network</u>** Post Easter-Lancaster University 6 week revision course.				
Literacy	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	Keywords: *Actual yield, *Atom economy, Avogadro constant, *Avogadro's law, Concentration, Conservation of mass, Limiting reactant, *Mole, *Percentage by mass, *Percentage yield, Relative formula mass, *Theoretical yield, Thermal decomposition, Uncertainty	

MOOR PARK HIGH SCHOOL: CURRICULUM

Numeracy	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	Balancing chemical equations Define one mole in terms of Mr and Ar Be able to convert cm_3 into dm_3. Rearrange the equation: C = m / v to make mass the subject.	
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.				