



Curriculum Map: Year 10

Subject: GCSE Chemistry (Separate Science) Exam Board: AQA

Topic	Key Knowledge <i>What will all students KNOW by the end of the topic?</i>	Key Skills <i>What key skills will be learnt/developed by the end of the topic? What will all students be able to DO by the end of the topic?</i>	Assessment Opportunities <i>What are the key pieces of assessment? How will students be assessed?</i>
Chemical Changes	<ul style="list-style-type: none">• How metals react with oxygen, water and acids• The order of metals, including carbon and hydrogen, in the reactivity series• What oxidation and reduction are in terms of electrons, oxygen and hydrogen• How metals are extracted from their ores using carbon reduction• Corrosion and its prevention• The pH scale and the use of a variety of indicators• The link between pH, [H⁺] and orders of magnitude• Neutralisation of acids and salt production• The general equation for neutralisation• The difference between strong and weak acids• The process of electrolysis including all key terms• How the electrolysis of molten ionic compounds yields products• How electrolysis can be used to extract more reactive metals• How the electrolysis of aqueous solutions yields products• How the electrolysis of aqueous solutions yields products <p>The explanation for the products produced at each electrode during electrolysis of aqueous solutions</p>	<ul style="list-style-type: none">• Mixing reagents to explore chemical changes and products• Applying the reactivity of metals including carbon and hydrogen to displacement reactions• Explain chemical formulae• Writing and balancing general and ionic equations• Writing and balancing ionic half equations• Identifying species that have been oxidised or reduced• Predicting products from given reactants• Competence of carrying out a multistep procedure, preparation of a pure, dry sample of a soluble salt• Using the pH scale to identify acidic or alkaline solutions• Measuring the pH of different acids and bases at different concentrations• Using the words, weak, strong, dilute and concentrated and neutral when applied to acids and their reactions• Setting up a simple electrochemical cell• Applying redox to write and balance half equations• Evaluation of the processes involved in extracting of metals from the ground and then by electrolysis• Predicting products from given reactants	<ul style="list-style-type: none">• Ongoing homework tasks• Starter tasks interleaving past knowledge• PPQ• AfL throughout lessons• Required practical – insoluble bases• Required practical - electrolysis• Assessment 1• Assessment 2 <p>Mock assessments</p>

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		<ul style="list-style-type: none"> • Setting up simple electrochemical cells • Competence of carrying out electrolysis of aqueous solutions <p>Applying redox to write and balance half equations</p>	
Quantitative Chemistry	<ul style="list-style-type: none"> • Consolidation of writing and balancing equations • Be familiar with specific key terms e.g. relative atomic mass/formula mass, mole, limiting reactant • The conservation of mass law • Avogadro's number - Amounts of substance can be measured in moles • How conservation of mass can be understood using formula masses and moles in balanced equations • How to calculate % of an element in a compound • How to calculate reacting masses in balanced equations • What limiting reactants are and their effect on reacting mass calculations • Percentage yield and atom economy • How concentration of solutions is measured in chemistry • What a titration is and how to carry one out • The relationship between moles, concentration and volume and the link between this and moles, mass and Mr • Be familiar with specific key terms e.g. relative atomic mass/formula mass, mole, limiting reactant, yield, concentration • The uncertainty associated with any measurements taken 	<ul style="list-style-type: none"> • Investigating mass changes using various apparatus • Writing, balancing and interpreting chemical equations • Use formula mass to calculate moles and vice versa • Recognising and use expressions in standard form • Using ratios, fractions and percentages • Changing the subject of a variety of equations • Converting units • Using appropriate numbers of significant figures • Changing the subject of a variety of equations • Identifying anomalous results and making estimations of uncertainty • Calculating the mean of a data set and use the range as a measure of uncertainty • Describing how to carry out titrations using strong acids and strong alkalis • Calculating the chemical quantities in titrations in both mol dm⁻³ and g dm⁻³ Competent use of technical laboratory equipment (pipette, pipette filler and burette) <p>Calculating the volumes of gaseous reactants and products from balanced equations</p>	<ul style="list-style-type: none"> • Homework • Starter tasks interleaving past knowledge • Constant marking of calculations • PPQ • AfL throughout lessons • Mock assessment <p>Required practical</p>

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	<ul style="list-style-type: none"> Equal moles of gases occupy the same volume (at RTP) <p>The volume of 1 mole of any gas is 24dm³</p>		
Energy Changes	<ul style="list-style-type: none"> Energy is conserved during chemical reactions What exothermic and endothermic reactions are including everyday examples of them How reaction profiles are used to represent chemical reactions What activation energy is Energy is needed to break chemical bonds Energy is released when new bonds are formed Chemical cells and fuel cells Alkaline cells and batteries Rechargeable cells and batteries <p>Fuel cells and the overall reaction within them</p>	<ul style="list-style-type: none"> Measuring temperature changes of simple chemical reactions and classifying them as exo or endothermic Investigating the variables that affect temperature changes Drawing and interpreting reaction profiles for exothermic and endothermic reactions Calculating energy changes in reactions using supplied data <p>Evaluating the use of hydrogen fuel cells compared to other cells and batteries</p>	<ul style="list-style-type: none"> Homework Starter tasks interleaving past knowledge Constant marking of calculations PPQ AfL throughout lessons
Homework topics: Chemistry of the atmosphere	<ul style="list-style-type: none"> The theory of how the Earth's early atmosphere was generated, how it has changed and what has and is currently changing it. Specifically: <ul style="list-style-type: none"> Combustion reactions Carbon dioxide production Other pollutants Locking up in rocks and the ocean Photosynthesis The proportions of the different gases in the atmosphere Principles behind the greenhouse effect How human activities contribute towards the greenhouse effect Principles behind and effects of climate change The definition of a carbon footprint, how its value is arrived at and how it can be reduced 	<ul style="list-style-type: none"> Explaining how (new) evidence can lead to changes in and/or re-enforcement of, accepted models. Be able to evaluate the quality of evidence Be able to describe uncertainties in evidence Be able to describe how a range of pollutants are formed and predict the products of combustion reactions Be able to describe and explain the problems caused by increased levels of pollutants Be able to describe effects of global climate change Be able to discuss the scale, risk and environmental implications of climate change <p>Be able to describe actions to reduce greenhouse gas emission but also why these may be limited</p>	<p>Marked in class/by teacher</p> <ul style="list-style-type: none"> Worksheets Quizzes Past exam questions <p>Assessment 1 Assessment 2 Mock assessment</p>

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	A range of common atmospheric pollutants, their sources and effects		
Homework topic: Earth's resources	<ul style="list-style-type: none"> • A range of renewable and finite resources and their origins. • What sustainable development is • How water treated and is made potable • How ceramics, polymers and composites are made as well as their properties • Ways of reducing the use of resources • What a Life Cycle Assessment is • How recycling, re-using and reducing can all have an impact on sustainability • How to protect iron from rusting • Why metals are alloyed <p>The properties polymers and how we can change the properties</p>	<ul style="list-style-type: none"> • Recalling key terminology. • Explaining how agriculture has an impact on the use of resources • Explaining how water (from a range of sources) is treated and made potable • Using simple laboratory equipment to make pure water by distillation. • Carry out and interpret chemical tests to the water before and after • Explaining how polymers are produced and the different properties of polymers • Qualitative comparisons of glass, ceramics, polymers, composites and metals • Applying understanding of sustainable development to a range of familiar and unfamiliar examples • How to carry out a simple Life Cycle Assessment Processing data from a wide range of sources relating to a wide range of products, services and processes 	<p>Marked in class/by teacher</p> <ul style="list-style-type: none"> • Worksheets • Quizzes • Past exam questions <p>Required Practical 8 Mock assessment</p>