



Curriculum Map

Subject: Triple Science Chemistry (GCSE Chemistry ONLY content in Red)

Year Group: 11

	Autumn 1/Autumn 2	Autumn 2	Autumn 2/Spring 1	Spring 2	Summer
Content	1 Review of Year 10 topics 2 Rates of Reaction Equilibria Reversible reactions -Energy changes and reversible reactions -Equilibrium -The effect of changing conditions on equilibrium: concentration, temperature and pressure	Crude Oil and Organic Chemistry Crude Oil, hydrocarbons and alkanes -Fractional distillation and petrochemicals -Properties of hydrocarbons -Cracking and alkenes -Structure and formulae of alkenes Ch10 Organic Reactions Names, Chemical Reactions, Displayed Formulae and Applications of: Alkenes, Alcohols, Carboxylic Acids, Esters The difference between strong and weak acids.	1 Chemical Analysis Pure substances -Formulations - Chromatography -Identification of common gases: hydrogen, oxygen, carbon dioxide, chlorine 2 Earth's Atmosphere the proportions of different gases in the atmosphere -The Earth's early atmosphere -How oxygen increased and carbon dioxide decreased -Greenhouse gases -Human activities which contribute to an increase in greenhouse gases in the atmosphere -Global climate change -The carbon footprint and its reduction -Atmospheric pollutants from fuels -Properties and effects of atmospheric pollutants Ch11 Polymers Monomers vs polymers Addition polymerisation Naming polymers Condensation polymers Natural polymers – formation of starch and cellulose, proteins.	Earth's Resources -Using the Earth's resources and sustainable development - Potable water -Waste water treatment -Alternative methods of extracting metals - Life cycle assessments -Ways of reducing the use of Resources Ch15 Using our resources Rusting – causes and prevention Alloys – composition and uses Properties of polymers, glass, clay ceramics, composites, and metals. The Haber Process – chemistry and economic factors Making fertiliser in the lab	Review and Revise

			<p>How amino acids react together DNA</p> <p>Ch12 Chemical Analysis Tests for positive and negative ions Instrumental analysis including flame emission spectroscopy</p>		
Skills	<p>Use of appropriate apparatus to make and record a range of measurements accurately, including mass, time, temperature, and volume of liquids and gases. -Use of appropriate apparatus and techniques for conducting and monitoring chemical reactions. -Safe use and careful handling of gases, liquids and solids, including careful mixing of reagents under controlled conditions. - Use scientific theories and explanations to develop hypotheses. -Plan experiments or devise procedures to make observations, produce or characterise a substance, test hypotheses, check data or explore phenomena. -Apply a knowledge of a range of techniques, instruments,</p>	<p>-Write balanced formula equations -Draw fully displayed structural formulae of the first four members of the alkenes and the products of their addition reactions with hydrogen, water, chlorine, bromine and iodine. - Recognise organic molecules from given formulae.</p> <p>Ch10 Organic Reactions Be able to name, write molecular formulae and displayed formulae for simple alkenes, alcohols, esters and carboxylic acids.</p>	<p>Use of appropriate apparatus to make and record a range of measurements accurately. -Safe use of a range of equipment to purify and/or separate chemical mixtures including chromatography. -Carry out experiments appropriately having due regard for the correct manipulation of apparatus, the accuracy of measurements and health and safety considerations. -Make and record observations and measurements using a range of apparatus and methods.</p> <p>Ch11 Polymers Draw diagrams representing the formation of polymers from monomers Recognise addition polymers and monomers from their displayed formulae. Relate monomers to polymers. Recognise the basic principles of condensation polymerisation – functional groups and repeating units.</p>	<p>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. -Safe use of a range of equipment to purify and/or separate chemical mixtures including evaporation, distillation. - Apply a knowledge of a range of techniques, instruments, apparatus, and materials to select those appropriate to the experiment. -Carry out experiments appropriately having due regard for the correct manipulation of apparatus, the accuracy of measurements and health and safety considerations. - Recognise when to apply a knowledge of sampling techniques to ensure any samples collected are representative. -Make and record observations and</p>	

	<p>apparatus, and materials to select those appropriate to the experiment. -Carry out experiments appropriately having due regard for the correct manipulation of apparatus, the accuracy of measurements and health and safety considerations. -Evaluate methods and suggest possible improvements and further investigations.</p>	<p>Write balanced chemical equations for their reactions. Predict products of different chemical reactions involving these organic compounds. Evaluate some applications and uses.</p>	<p>Recognise how the monomers are arranged in DNA.</p> <p>Ch12 Chemical Analysis Carry out chemical tests for cations and anions, systematically recording results and identifying unknowns. Comparing instrumental methods with traditional chemical tests. Interpreting results from flame emission spectroscopy.</p>	<p>measurements using a range of apparatus and methods. - Evaluate methods and suggest possible improvements and further investigations.</p> <p>Ch15 Using our Resources Investigation on what makes iron rust Protecting iron and preventing rusting Interpret and evaluate the composition and use of alloys using information and data. Compare thermosetting and thermosoftening plastics. Predict how changing reaction conditions can modify the properties of the resulting polymer Show how the properties of materials are related to their uses. Why is the haber process important? Why are the reaction conditions used in the Haber process a compromise based on availability and cost of raw materials and energy supplies, control of equilibrium position and rate? How do you prepare a fertiliser in the school lab?</p>	
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<p>Key questions</p>	<p>What are reversible reactions and how can we represent them? How are reversible reactions affected by changing the reaction conditions? What is a dynamic equilibrium and how can we use Le Chatelier's Principle to explain how changing certain conditions can affect the composition of the equilibrium?</p>	<p>What is crude oil and how can it be made useful? What are alkenes and why are they useful? How does Fractional Distillation work? What are the different types of combustion reaction? What is Cracking and why is it useful?</p> <p>Ch10 Organic Chemicals How can you represent different the structures of organic molecules on paper? What rules are there for the naming of organic chemicals? What can alcohols, esters, carboxylic acids and alkenes be used for? Why are carboxylic acids</p>	<p>What do chemists mean by Purity? What is a formulation? How can melting point data tell us if something is pure or impure? How can chromatography be used to distinguish pure from impure substances? What chemical tests can we do to identify different gases? What is the composition of the Earth's atmosphere? How has it changed over time? How can we explain these changes? What are the consequences of global climate change? What causes atmospheric pollutants and what effects do they have?</p> <p>Ch11 Polymers What are monomers? What are polymers? What are the different ways of making polymers, how are they similar and how are they different? Why are polymers useful? What environmental problems do polymers cause? How are natural polymers made?</p> <p>CH12 Chemical Analysis What chemical tests can help identify positive and negative ions?</p>	<p>What is the difference between finite and renewable resources? What is the difference between potable water and pure water? How do we treat waste water to make it more safe? How do we treat water to make it potable? How do we extract metals from their ores? What are Life Cycle Assessments and how are they useful? How does using less, reusing and recycling materials decrease their environmental impact?</p> <p>Ch15 Using our Resources Why does iron rust? How can we prevent it from rusting? Why are alloys useful? Why do the properties of polymers depend on the reaction conditions and on the monomers used? How do the properties of materials relate to their uses?</p>	
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		described as weak acids?	What can flame emission spectroscopy be used for? What are the advantages and disadvantages of instrumental techniques compared to traditional chemical tests?		
Assessment	Formative 'low stakes' assessments to take place more frequently throughout the term. This could be in the form of a range methods: <ul style="list-style-type: none"> • Quiz • Homework task • Microsoft Forms short tests • In class short tests • Questions and answer sessions • Spelling tests • Group work tasks • Peer assessments Literacy and numeracy activities End of term summative assessments PPEs		Formative 'low stakes' assessments to take place more frequently throughout the term. This could be in the form of a range methods: <ul style="list-style-type: none"> • Quiz • Homework task • Microsoft Forms short tests • In class short tests • Questions and answer sessions • Spelling tests • Group work tasks • Peer assessments Literacy and numeracy activities End of term summative assessments PPEs GCSE exams		
Literacy/ Numeracy/ SMSC/ Character	Literacy: Writing up class practicals including required practicals. Using models to explain chemical processes. Numeracy: Balancing equations. Interpreting data. SMSC/Character: Appreciating the environmental impact of industrial chemical processes.		Literacy: Writing up class practicals including required practicals. Using models to explain chemical processes. Numeracy: Balancing equations. Interpreting data. SMSC/Character: Appreciating the environmental impact of industrial chemical processes. Appreciating the concept of Life Cycle Assessment and applying it to everyday products.		Developing exam technique, gaining marks for showing working during calculations, ensuring your extended writing includes sufficient scientific detail, effective

			revision, resilience.
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