

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
7	<p><b>Topic:</b> Mixing, dissolving and separating (part 1)</p> <p><b>Subject links:</b> Working safely, Recording experiments, Materials, substances and elements, Understanding water, Dissolving, separating and evaporating, Extracting salt, Distillation.</p> <p><b>Learner Skills</b> TS: ask questions, evaluate risks, use nomenclature. WS: record results, use units, develop dexterity and laboratory skills.</p>	<p><b>Topic:</b> Mixing, dissolving and separating (part 2)</p> <p><b>Exam:</b> End of unit/RA</p> <p><b>Subject links:</b> Applying key ideas, What is air made of? Chromatography, Finding the best solvent, Modelling mixtures and separation.</p> <p><b>Learner Skills</b> TS: use nomenclature and visualise concepts. WS: record evidence, develop dexterity and laboratory skills. Develop maths skills (ratios).</p>	<p><b>Topic:</b> Elements, compounds, reactions (part 1)</p> <p><b>Subject links:</b> Elements and building the Periodic Table, Looking at the Periodic Table, Elements and atoms, Metals, non-metals and metalloids, Discovering the origin of metals, Choosing elements for a purpose</p> <p><b>Learner Skills</b> TS: ask questions, use logic and nomenclature. WS: record observations, research ideas, uses data for prediction.</p>	<p><b>Topic:</b> Elements, compounds, reactions (part 2)</p> <p><b>Exam:</b> End of unit/RA</p> <p><b>Subject links:</b> Applying key ideas, Combining elements, Using models in chemistry, What happens when an element burns?, How do elements react in differently?, The special features of carbon, Oxidation, Investigating carbonates, Explaining changes.</p> <p><b>Learner Skills</b> TS: evaluate models, explain concepts, visualise concepts. WS: record evidence, evaluate risks, develop dexterity and laboratory skills.</p>	<p><b>Topic:</b> Explaining Physical changes</p> <p><b>Exam:</b> End of year/RA</p> <p><b>Subject links:</b> Using particle models to explain matter, Understanding solids, Understanding liquids and gases, Changing state and evaporation, Thermal expansion, Density of solids, liquids and gases, Concentration, pressure and diffusion, Conserving mass, Physical and chemical changes, The properties of mixtures.</p> <p><b>Learner Skills</b> TS: ask questions, evaluate risks, use nomenclature, critique data and evaluate models. WS: record evidence, draw graphs, display data.</p>	
	<p><b>Rationale:</b> Introduce simple physical changes that students can explain using scientific language.</p>	<p><b>Rationale:</b> Develop the understanding that mixtures are all around us and can be separated.</p>	<p><b>Rationale:</b> Looking at the history of science, the classification of elements in the periodic table and how that underpins understanding.</p>	<p><b>Rationale:</b> Extending scientific ideas from things we can see around us to using models for things we cannot see.</p>	<p><b>Rationale:</b> Combining scientific models with the earlier material observations to explain concepts in scientific terms. Maths skill for data handling and graph drawing.</p>	
8	<p><b>Topic:</b> Explaining Chemical Changes (part 1)</p> <p><b>Subject links:</b> Describe the reactions between acids and bases.</p> <p><b>Learner skills:</b> TS: ask questions, evaluate risks, use nomenclature and visualise concepts. WS: record evidence, evaluate risks, develop dexterity and laboratory skills  Develop maths skills.</p>	<p><b>Topic:</b> Explaining Chemical Changes (part 2)</p> <p><b>Exam:</b> End of Unit Test</p> <p><b>Subject links:</b> Describe the tests for gases and describe combustion reactions.</p> <p><b>Learner skills:</b> TS: ask questions, evaluate risks, use nomenclature, and visualise concepts. WS: record evidence, evaluate risks, develop dexterity and laboratory skills.</p>	<p><b>Topic:</b> Obtaining useful materials (part 1)</p> <p><b>Subject links:</b> Describe displacement reactions, describe exothermic and endothermic reactions and describe reactivity.</p> <p><b>Learner Skills</b> TS: ask questions, evaluate risks, use nomenclature. WS: record evidence, use units, develop dexterity and laboratory skills.</p>	<p><b>Topic:</b> Obtaining useful materials (part 2)</p> <p>Exam: End of unit test</p> <p><b>Subject links:</b> Describe reactivity and the uses of catalysts in industry. Describe ceramics, polymers and composites.</p> <p><b>Learner Skills</b> TS: ask questions, evaluate risks, use nomenclature. WS: record evidence, develop dexterity and laboratory skills.  Develop maths skills, think creatively.</p>	<p><b>Topic:</b> Using our Earth sustainably</p> <p><b>Exam:</b> End of unit test</p> <p><b>Subject links:</b> Explain changes in the atmosphere. Explain the importance of recycling.</p> <p><b>Learner Skills</b> TS: ask questions, evaluate risks, use nomenclature, critique data and evaluate models. WS: record evidence.  Develop debating skills.</p>	<p><b>Final exam</b> will in part test maths and literacy skills, in addition to the entire course.</p> <p><b>TS =</b> Thinking scientifically. <b>WS=</b>Working scientifically.  <b>All topics</b> encourage Collaboration and communication.</p>

	<b>Rationale:</b> Introduce acid and base reactions, a key concept in GCSE	<b>Rationale:</b> Introduce combustion reactions and tests for gases. These are key to understanding GCSE.	<b>Rationale:</b> Learning about these topics will help the students with key concepts in GCSE.	<b>Rationale:</b> Learning about these topics will help the students with key concepts in GCSE, in addition to some triple content.	<b>Rationale:</b> Learning about these topics will help students engage with climate change and recycling. Additionally, this material will provide a good foundation for GCSE.	
<b>9</b>	<b>Topic:</b> Atomic structure & the periodic table <b>Exam:</b> Paper 1  <b>Subject links:</b> The history of the atomic model; Electron configuration; The arrangement and history of the periodic table.  <b>Learner Skills:</b> TS: visualise concepts and formulate a response WS: record evidence, evaluate risks. Critical thinking.	<b>Topic:</b> Simple chemical analysis <b>Exam:</b> Paper 2  <b>Subject links:</b> Purity and MP; Chromatography; Formulations; Identification of gases.  <b>Learner Skills:</b> TS: visualise concepts, examine results WS: record evidence, evaluate risks, develop lab skills. Critical thinking, develop maths skills such as fractions and ratios.	<b>Topic:</b> Our atmosphere <b>Exam:</b> Paper 2  <b>Subject links:</b> The history of Earth's atmosphere; The modern atmosphere; The Greenhouse effect and gases.  <b>Learner Skills:</b> TS: visualise concepts, examine results, judge information WS: record evidence, evaluate risks, develop lab skills. Develop literacy and critical thinking.	<b>Topic:</b> The atmosphere and Earth's resources <b>Exam:</b> Paper 2  <b>Subject links:</b> Atmospheric pollutants; Obtaining water safe to drink.  <b>Learner Skills:</b> TS: visualise concepts, examine results, judge information. WS: record evidence, evaluate risks, develop lab skills. Develop literacy and critical thinking.	<b>Topic:</b> Structure and Bonding, Core practical completion. <b>Exam:</b> Paper 1  <b>Subject links:</b> Ionic, covalent and metallic bonding; The properties of differently bonded substances; The bonding in carbon compounds.  <b>Learner Skills:</b> TS: visualise concepts, examine results, judge information, and formulate a response. WS: record evidence, evaluate risks, develop lab skills. Critical thinking.	

GCSE Subject AOS	AO1	AO2	AO3	AO4	AO5	AO6	AO7
<b>Rationale:</b> An introduction to the core concepts of atoms that will underpin all GCSE work.	<b>Rationale:</b> An introduction to the concept of analysis and melting points. A chance to do some practical chemistry after the conceptual nature of topic 1.	<b>Rationale:</b> The foundations of the important topic of climate change and the science behind it. A chance to relate chemistry to real world issues.	<b>Rationale:</b> Understanding of the main pollutants and avoiding them in the modern world. Time to consider the wider world and the problems that some countries face.	<b>Rationale:</b> The next building block in basic chemistry. Building on the work done in term 1, chance to revisit atomic structure and extend students' understanding to cover the combination of elements into compounds.			

	<b>Autumn 1</b>	<b>Autumn 2</b>	<b>Spring 1</b>	<b>Spring 2</b>	<b>Summer 1</b>	<b>Summer 2</b>
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10	<p><b>Topic:</b> Chemical changes 1 <b>Exam:</b> Paper 1</p> <p><b>Subject links:</b> Reactions of acids; Reactivity of metals.</p> <p><b>Learner Skills</b> TS: visualise concepts and formulate a response WS: record evidence, evaluate risks and develop lab skills. Draw connections from ideas.</p>	<p><b>Topic:</b> Chemical calculations <b>Exam:</b> Paper 1</p> <p><b>Subject links:</b> Measurements &amp; mass; Amount of substance calculations.</p> <p><b>Learner Skills</b> TS: visualise concepts and formulate a response WS: record evidence, evaluate risks, develop lab skill, use units. Maths skills: percent, ratios, fractions and algebra.</p>	<p><b>Topic:</b> Electrolysis <b>Exam:</b> Paper 1</p> <p><b>Subject links:</b> Electrolysis of aqueous solutions; writing half equations; oxidation and reduction.</p> <p><b>Learner Skills</b> TS: visualise concepts and formulate a response WS: record evidence, evaluate risks, develop lab skills Draw connections from ideas and justify responses.</p>	<p><b>Topic:</b> Chemical &amp; energy changes. <b>Exam:</b> Paper 1</p> <p><b>Subject links:</b> Weak and strong acids. Endothermic and exothermic reactions.</p> <p><b>Learner Skills</b> TS: visualise concepts and formulate a response WS: record evidence, evaluate risks, develop use of units. Draw connections between ideas.</p>	<p><b>Topic:</b> Rates &amp; Equilibrium <b>Exam:</b> Paper 2</p> <p><b>Subject links:</b> Rate of reactions; Dynamic equilibrium and le Chatelier's principle.</p> <p><b>Learner Skills</b> TS: visualise concepts and formulate a response WS: record evidence, evaluate risks, develop lab skill, use units Maths skills: graphs. Draw connections from ideas.</p>	<p><b>Topic:</b> The Earths resources and Core practical completion. <b>Exam:</b> Both papers</p> <p><b>Subject links:</b> Chemical life cycles and recycling; Core practicals on acid reactions.</p> <p><b>Learner Skills</b> TS: visualise concepts, judge data and formulate responses. WS: record evidence, evaluate risks, develop lab skill, use units. Maths skills: graphs and percent. Draw connections from ideas.</p>
	<p><b>Rationale:</b> The first concept underpinning chemical analysis which will be extended later in year 11.</p>	<p><b>Rationale:</b> The concept of moles and calculations is a difficult one but must be covered before year 11.</p>	<p><b>Rationale:</b> Deconstructing equations to show the ions involved is a key skill which can be covered now ionisation is understood.</p>	<p><b>Rationale:</b> Building on the mole calculations these show how energy changes and pH are calculated.</p>	<p><b>Rationale:</b> The last calculation topic to cover in year 10 before classes are divided into double and triple award.</p>	<p><b>Rationale:</b> Some students miss core practical or forget their importance – a chance to revisit practical skills.</p>
11	<p><b>Topic:</b> Chemical calculations <b>Exam:</b> Paper 1</p> <p><b>Subject links:</b> Titrations and concentration; Yield and atom economy; Volumes of gases.</p> <p><b>Learner Skills</b> TS: Employ numerical data to solve complex problems WS: record evidence, employ units, evaluate risks and develop lab skills Think analytically. Maths skills: fractions, percentages and algebra</p>	<p><b>Topic:</b> Chemical cells, fuel cells and identification of ions. <b>Exam:</b> Paper 2</p> <p><b>Subject links:</b> Chemical fuel cells, practical identification of anions and cations.</p> <p><b>Learner Skills</b> TS: Employ qualitative and quantitative data to solve complex problems WS: record evidence, employ units, evaluate risks and develop lab skills Maths skills: fractions, percentages and algebra and think analytically</p>	<p><b>Topic:</b> Organic chemistry <b>Exam:</b> Paper 2</p> <p><b>Subject links:</b> Carbon as fuel, Alkanes, Alkenes, Alcohols and Polymers.</p> <p><b>Learner Skills</b> TS: visualise concepts and formulate a response WS: record evidence, evaluate risks and develop lab skills Draw connections among ideas and think creatively.</p>	<p><b>Topic:</b> Using our resources. <b>Exam:</b> Paper 2</p> <p><b>Subject links:</b> Rusting, Alloys, Polymer properties, composites.</p> <p><b>Learner Skills</b> TS: visualise concepts and examine results WS: record evidence, evaluate risks and develop lab skills Develop critical thinking. Maths skills: fractions and graphs</p>	<p><b>Topic:</b> Haber process/revision <b>Exam:</b> Paper 2/both</p> <p><b>Subject links:</b> The Haber process, Haber economics, making fertilisers.</p> <p><b>Learner Skills</b> TS: visualise concepts and examine results WS: record evidence, evaluate risks and develop lab skills. Critical thinking. Maths skills: fractions and graphs</p>	<p><b>Year 11 Exams:</b></p> <p><b>Learner Skills Key (KS4)</b> TS= Thinking scientifically WS=Working scientifically All topics encourage effective collaboration and communication skills.</p>
	<p><b>Rationale:</b> Further calculations building on Y10 work. Triple award units only</p>	<p><b>Rationale:</b> Chemical properties and analysis building on chemical changes</p>	<p><b>Rationale:</b> Extending the ideas of bonding to include IMF and the effect these have</p>	<p><b>Rationale:</b> Extending the ideas taught about structure and bonding to real-life</p>	<p><b>Rationale:</b> Bringing all the skills of year 10 and 11 together in a final topic based in fertiliser</p>	

	not appropriate to double award classes.	and electrolysis from year 10. Triple award only.	on BP. Alkenes, alcohols and polymers are triple award only.	situations. Triple award only.	manufacture. Triple award only.	
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	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
<b>Year 12 Teacher 1</b>	<p><b>Topic:</b></p> <ul style="list-style-type: none"> <li>Module 2: Ch2 Atoms and electrons</li> <li>Module 2: Ch4 Moles in solids, solutions and gases</li> </ul> <p><b>Subject links</b> The basis of the rest of the course depends on understanding of atoms, electrons and moles.</p> <p><b>Learner Skills</b> Visualisation of electronic orbitals and energy levels. Maths skills for mole calculations. Interpretation of multistep questions.</p>	<p><b>Topic:</b></p> <ul style="list-style-type: none"> <li>Module 2: Ch6 Acid bases</li> <li>Module 3: Ch8 Periodic table</li> </ul> <p><b>Subject links</b> Definitions of acids and bases in terms of protons and electrons. The importance of bonding and structure on properties.</p> <p><b>Learner Skills</b> Titration practical skills. Tabulations and calculations using volumes and concentration. Prediction of structure based on elements' bonding.</p>	<p><b>Topic:</b></p> <ul style="list-style-type: none"> <li>Module 3: Ch9 Group 2 and the Halogens</li> <li>Module 3: Ch10 Enthalpy</li> </ul> <p><b>Subject links</b> Testing for ions and extending knowledge of the periodic table. Calculating enthalpy by Hess cycles.</p> <p><b>Learner Skills</b> Maths skills and calculations, using logic to elucidate enthalpy changes.</p>	<p><b>Topic:</b></p> <ul style="list-style-type: none"> <li>Module 3: Ch11 Rates</li> </ul> <p><b>Subject links</b> Understanding and calculating rates of reactions from empirical data and applying Boltzmann distributions.</p> <p><b>Learner Skills</b> Plotting graphs and extrapolating to determine gradients and maximum change. Interpretation of a Boltzmann distribution.</p>	<p><b>Topic:</b></p> <ul style="list-style-type: none"> <li>Module 3: Ch11 Equilibria</li> </ul> <p><b>Subject links</b> Revisiting reversible reactions and le Chatelier's principle. Calculating Kc and equilibria concentrations using data.</p> <p><b>Learner Skills</b> Constructing mathematical expressions, use of significant figures in calculations. Estimating the effect of changing conditions</p>	<p><b>Topic:</b></p> <ul style="list-style-type: none"> <li>Module 3: Ch9 Qualitative analysis</li> </ul> <p><b>Subject links</b> Evaluate adding chemicals to water. Know the reaction of chemicals with sodium hydroxide. Use silver nitrate and ammonia to identify halide ions</p> <p><b>Learner Skills</b> Practical skills, applying investigative approaches. Recording accurate data and tabulation of results.</p>
	<p><b>Rationale:</b> Revisiting the GCSE concepts of atomic structure and moles and extending them to a more complete picture.</p>	<p><b>Rationale:</b> Acids and titrations underpin much of chemistry as does a secure understanding on bonding, this must be covered at an early stage.</p>	<p><b>Rationale:</b> Follows on from work on the periodic table and bonding in term 2 to consolidate bonding and properties of compounds.</p>	<p><b>Rationale:</b> Extension of the basic rates topic taught at GCSE. Includes a higher level of graph drawing and mathematical skills, underpins rates and Arrhenius at A2.</p>	<p><b>Rationale:</b> First introduction to a constant (K), the idea of which will be extended at A2. A chance to consolidate equilibrium which is often poorly understood at GCSE.</p>	<p><b>Rationale:</b> Dovetails with work on tests for Haloalkanes and extends previous work on group II and the Halogens.</p>

Year 12 Teacher 2	<p><b>Topic:</b> Module 2: Ch3 Compounds, formulae &amp; equations</p> <p><b>Subject links</b> The formulae of ionic compounds from ionic charges. Prediction of ionic charge from an element's position in the periodic table Construction of balanced and ionic equations.</p> <p><b>Learner Skills</b> Applying mathematical and chemical rules to chemical systems and equations.</p>	<p><b>Topic:</b> Module 2: Ch7 Bonding Module 2: Ch6 Redox reactions</p> <p><b>Subject links</b> Define covalent and ionic bonding, describe the shapes of molecules, explain the influence of electronegativity and the strength of IMFs.</p> <p><b>Learner Skills</b> Using rules to predict type of bonding, type of IMF and state at any particular temperature. Drawing 3D molecular shapes. Using rules to predict redox numbers. Developing skills of predicting properties from forces between atoms.</p>	<p><b>Topic:</b> Module 4: Ch12 Basic concepts in Organic Module 4: Ch13 Hydrocarbons; Alkanes, Alkenes and isomerism</p> <p><b>Subject links</b> Homologous series. Isomerism including E-Z. Calculate reacting masses, percentage yields and atom economy. Explain mechanisms: free radical substitution, electrophilic addition.</p> <p><b>Learner Skills</b> Drawing structural formulae and isomers. Visualisation of concepts. Using naming conventions to name molecules. Drawing mechanisms. Simple maths skills to calculate yields and percentage.</p>	<p><b>Topic:</b> Module 4: Ch14 Alcohols</p> <p><b>Subject links</b> Naming and classification of alcohols. Combustion and oxidation of alcohols. Method for oxidation alcohols. Chemical tests to distinguish aldehydes and ketones. Mechanism for elimination, equations for the production of alcohols from alkenes.</p> <p><b>Learner Skills</b> Planning experiments, refluxing and distillation skills. Understanding organic functional groups and linking experimental conditions to outcomes. Developing investigational techniques. Drawing mechanisms.</p>	<p><b>Topic:</b> Module 4: Ch14 Haloalkanes Module 4: Ch15 Organic synthesis</p> <p><b>Subject links</b> Trend in reactivity from primary to tertiary halogenoalkanes. Nucleophilic substitution of alcohols, cyanide and amines. Reaction conditions relationship to products. Ozone and its chlorine catalysed decomposition.</p> <p><b>Learner Skills</b> Planning experiments. Understanding organic functional groups and linking experimental conditions to outcomes. Developing investigational techniques. Linking chemistry to the environment. Drawing mechanisms.</p>	<p><b>Topic:</b> Module 4: Ch15 Analytical techniques</p> <p><b>Subject links</b> Be confident in the use of practical skills Understanding synthetic routes of one, two or three steps. Infrared spectroscopy and mass spectrometry analysis.</p> <p><b>Learner Skills</b> Planning experiments. Recognising organic functional groups. Developing investigational techniques. Using data, interpreting graphs and technical data to form a conclusion. Using logical arguments to justify conclusions.</p>
	<p><b>Rationale:</b> Builds on knowledge of the periodic table to explain why the rules learnt at GSCE apply.</p>	<p><b>Rationale:</b> Consolidation of GCSE models and extension into shapes and rules for understanding the nature of molecular substances.</p>	<p><b>Rationale:</b> Introduction to the complexities of organic chemistry including nomenclature, isomerism and first mechanism (electrophilic).</p>	<p><b>Rationale:</b> Deepening of the knowledge of organic chemistry and identification of alcohols as a central molecule in many synthetic routes.</p>	<p><b>Rationale:</b> Linking of organic chemistry to environmental issues as well as introducing the second mechanism (nucleophilic).</p>	<p><b>Rationale:</b> An summary module designed to test the depth of students understanding of organic molecules and interpretive skills..</p>
A LEVEL Subject AOs	AO1	AO2	AO3	AO4	AO5	

A LEVEL Subject AOS	AO1	AO2	AO3	AO4	AO5
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	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
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Year 13 Teacher	<p><b>Topic:</b> 5.1.1 How Fast? 6.1.1 Aromatic Compounds</p> <p><b>Exam:</b> End of topic test</p> <p>Subject links: Orders, rate equations and rate constants. Rate graphs, rate-determining step, effect of temperature on rate constants Arrhenius equation. Benzene and aromatic compounds. Electrophilic substitution, phenols.</p> <p><b>Learner Skills</b> TS: Employ qualitative and quantitative data to solve complex problems WS: record evidence, employ units, evaluate risks and develop lab skills Maths skills: Developing use of logs, ratios and inverse relationships</p>	<p><b>Topic:</b> 5.1.2 How Far 6.2.1. Carbonyl compounds 6.1.3 Carboxylic acids and esters 5.2.1 Lattice enthalpy</p> <p><b>Exam:</b> Short mock</p> <p>Subject links: Equilibrium, Kc, Kp and equilibrium constants. Reactions of carbonyl compounds, characteristic tests of carbonyl compounds. Properties of carboxylic acids, esters and acyl chlorides. Born Haber and related enthalpy cycles</p> <p><b>Learner Skills</b> TS: Employ qualitative and quantitative data to solve complex problems. Think creatively. Draw on ideas from other areas. WS: record evidence, employ units, evaluate risks, research topics and develop lab skills Maths skills: Applying mathematical concepts to unfamiliar situations</p>	<p><b>Topic:</b> 5.2.2 Enthalpy and entropy 5.1.3 Acids, bases and buffers 5.2.3 Redox and electrode potentials</p> <p><b>Exam:</b> End of topic test</p> <p><b>Subject links:</b> Enthalpy, entropy and free energy. Bronsted-Lowry acids and bases. pH and H<sup>+</sup> ion concentration. Buffer actions and calculations. Neutralisation. Redox titrations. Electrode potentials. Storage and fuel cells.</p> <p><b>Learner Skills</b> TS: Employ qualitative and quantitative data to solve complex problems WS: record evidence, employ units, evaluate risks and develop lab skills Maths skills: Applying mathematical concepts to unfamiliar situations</p>	<p><b>Topic:</b> 6.2.1 Amines 6.2.2 Amino acids, amides and chirality 5.3.1 Transition elements 5.3.2 Qualitative analysis</p> <p><b>Exam:</b> Full mocks</p> <p><b>Subject links:</b> Basicity and preparation of amines, reactions of amino acids, amides and chirality.</p> <p><b>Learner Skills</b> TS: Employ qualitative and quantitative data to solve complex problems. Think creatively. Draw on ideas from other areas. WS: record evidence, employ units, evaluate risks, and develop lab skills Maths skills: Applying mathematical concepts to unfamiliar situations</p>	<p><b>Topic:</b> 6.2.3 Polyesters and polyamides 6.2.4 Carbon –Carbon bond formation 6.2.5 Organic synthesis 6.3.1 Chromatography and qualitative analysis. 6.3.2 Spectroscopy</p> <p><b>Exam:</b> Full mocks</p> <p><b>Subject links</b> Condensation polymers Extending carbon chain length. Synthetic routes. Chromatography and tests for organic functional groups. Proton NMR spectroscopy &amp; high resolution carbon-13 NMR. Combined experimental techniques.</p> <p><b>Learner Skills</b> TS: Employ qualitative and quantitative data to solve complex problems. Think creatively. Draw on ideas from other areas. WS: record evidence, employ units, evaluate risks and develop lab skills. Maths skills: Applying mathematical concepts to unfamiliar situations</p>	<p><b>Year 13 Exams:</b></p> <p><b>Learner Skills Key (KS5)</b></p> <p>TS= Thinking scientifically</p> <p>WS=Working scientifically</p> <p>All topics encourage effective collaboration and communication skills.</p>
	<p><b>Rationale:</b> Understanding these key concepts is critical to achieving a good grade. Real world applications include: synthesis and testing of pharmaceuticals</p>	<p><b>Rationale:</b> Understanding these key concepts is critical to achieving a good grade. Real world applications include: synthesis and testing of pharmaceuticals</p>	<p><b>Rationale:</b> Understanding these key concepts is critical to achieving a good grade. Real world applications include: design of batteries and fuel cells.</p>	<p><b>Rationale:</b> Understanding these key concepts is critical to achieving a good grade. Real world applications include: how to make polymers.</p>	<p><b>Rationale:</b> Understanding these key concepts is critical to achieving a good grade. Real world applications include: how formulations are analysed in industrial research, synthesis and testing of pharmaceuticals and how the structures of simple molecules is discovered.</p>	

