



Learning Aims and Curriculum Intent:

In Year 11 Chemistry lessons at Forest, students will continue to acquire knowledge and understanding of chemical facts, terminology, concepts, principles, and practical techniques. They will learn to apply the principles and concepts of chemistry, including those related to the applications of chemistry, to different contexts. Opportunities will be given to link together fundamental concepts and apply these to real-life situations. They will appreciate the practical nature of chemistry, developing experimental and investigative skills based on correct and safe laboratory techniques, and recognise the importance of accurate experimental work and reporting scientific methods in chemistry. They will continue to develop their exam technique through developing a logical approach to problem solving in a wider context and will learn to evaluate chemical information to synthesise patterns. The topics include types of reactions, energy, electrolysis, and metals.

Term	Content, Key Questions and Knowledge	Skills	Assessment
Michaelmas	Types of Reactions <ul style="list-style-type: none"> Redox reactions including combustion, displacement and ionic compound formation Solubility of compounds in water and precipitation reactions Neutralisation reactions Making salts through reactions of acids with metals, metal oxides, metal hydroxides and metal carbonates Titration as a method of making salts, and a method to determine the concentration of an unknown acid/alkali Thermal decomposition of metal carbonates 	Representing chemical and word equations Observing, describing and recording experimental results, both qualitative and quantitative Working safely and following a set of instructions carefully Using a pipette and burette to carry out a titration, including writing a method to explain how to carry out a titration accurately.	Each topic consists of a 40-minute End of Topic Written Test.
	Energy <ul style="list-style-type: none"> How can we classify reactions as exothermic and endothermic depending on the temperature change? How can we calculate the enthalpy change in a combustion reaction? Do fuels all release the same amount of energy? What is a displacement reaction and how can the enthalpy change of a displacement reaction be calculated? How can the enthalpy of solution and enthalpy of neutralisation be calculated? How can we determine whether a reaction will be endothermic or exothermic without doing an experiment? How do we use energy level diagrams to show energy change as a result of a reaction? How can we use bond energies to calculate energy change for reactions? 	Measuring temperature changes Carrying out an experiment to determine the enthalpy change of reaction, minimising errors.	Each topic consists of a 40-minute End of Topic Written Test.
Lent	Electrolysis (Separate Science) <ul style="list-style-type: none"> How electrolysis of molten substances works, and why only ionic compounds can undergo electrolysis Writing half and full equations for electrolysis of molten compounds including both seen reactions (e.g. extraction of aluminium) and unseen reactions Preferential discharge in the electrolysis of aqueous solutions Writing half and full equations for electrolysis of aqueous compounds including both seen reactions (e.g. electrolysis of NaCl) and unseen reactions How electrolysis can be utilised to purify copper Metals <ul style="list-style-type: none"> Draw diagrams to represent the bonding in metals Describe the typical properties of metals, and explain these by linking the properties to their structures. Describe what an alloy is, and explain how alloying a metal affects its structure and properties How we use knowledge of reactivity to extract metals from the Earth's crust How we use knowledge of reactivity to predict displacement reactions between metals and metal salts How the bonding structure affects the property of a metal How pure metals compare to their alloys 	Making observations in electrolysis reactions in order to identify the products formed. Writing half and full equations, with balanced electron numbers, for electrolysis of molten and aqueous compounds Carrying out experiments to accurately determine the number of moles of gas produced by a reaction	Mock Exams Each topic consists of a 40-minute End of Topic Written Test.
Trinity	Gas volumes and equilibria (Separate Science) <ul style="list-style-type: none"> What the term "equilibrium" means in Chemistry and what the conditions needed for a reaction to be at equilibrium is How changing concentration and pressure affects the position of equilibrium How changing temperature affects the position of equilibrium How catalysts affect the position of equilibrium and why they are so important for industry How do we calculate numbers of moles of gases using molar gas volumes? 	Carrying out experiments to produce an ester Drawing displayed structural formulae and using these to show the changes that take place during reactions.	Each topic consists of a 40-minute End of Topic Written Test.

<p>Organic chemistry (Separate Science)</p> <ul style="list-style-type: none"> • What alcohols are and how they can be formed by fermentation or hydration of alkenes • Reactions of alcohols, including combustion, oxidation and esterification • How carboxylic acids form and how they react with compounds such as metals, metal oxides and metal carbonates • How esters form and the properties of esters <p>What condensation polymers and how they form from alcohols and carboxylic acids</p>		
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Examples of Homework	CenturyTech, ActiveLearn, exam questions, research tasks.	
Key terminology	Oxidation, reduction, redox, displacement, exothermic, endothermic, combustion, neutralisation, electrolysis, aqueous, reactivity, alloy.	
Super-curricular enrichment and scholarly extension	<p>Read:</p> <ul style="list-style-type: none"> • "Chemistry: A Molecular Approach" by Nivaldo J. Tro • "Chemistry: Introducing Inorganic, Organic and Physical Chemistry" by Andy Burrows, John Holman, and Andrew Parsons • "Cambridge IGCSE Chemistry Study and Revision Guide" by David Besser <p>Watch:</p> <ul style="list-style-type: none"> • "Chemistry: Challenges and Solutions" (Annenberg Learner) • "The Mystery of Matter: Search for the Elements" (PBS) • "The Secrets of Chemistry" (BBC Four) • "Chemistry: A Volatile History" (BBC Four) <p>Listen:</p> <ul style="list-style-type: none"> • "Chemistry World Podcast" by the Royal Society of Chemistry • "The Science Hour" by the BBC • "Naked Scientists Chemistry" by The Naked Scientists • "The Science of Everything Podcast" by James Fodor <p>Visit:</p> <ul style="list-style-type: none"> • The Royal Society of Chemistry (RSC) in London: Explore their exhibits, attend chemistry-themed events, and participate in workshops. • The Science Museum in London: Visit their chemistry-related exhibits, such as the "Wellcome Wing" and the "Chemistry Bar." • Local universities or colleges: Inquire about opportunities to visit their chemistry departments or attend guest lectures by professors and researchers. 	
Useful websites	<ol style="list-style-type: none"> 1. Royal Society of Chemistry (RSC) Education: The RSC Education website provides a wide range of resources, experiments, and interactive activities for chemistry students. It covers topics such as rates of reaction, bonding, calculations, and organic chemistry. Visit: https://edu.rsc.org/ 2. Khan Academy: Khan Academy offers free video lessons, practice exercises, and quizzes on chemistry topics. Their chemistry section covers various concepts, including bonding, reactions, and calculations. Visit: https://www.khanacademy.org/science/chemistry 3. BBC Bitesize: BBC Bitesize offers educational resources, articles, and quizzes for different subjects, including chemistry. Their chemistry section covers topics such as rates of reaction, bonding, and organic chemistry. Visit: https://www.bbc.co.uk/bitesize/subjects/zs6hvew 4. Chemguide: Chemguide provides comprehensive explanations, tutorials, and practice questions for A-level chemistry topics. It covers areas such as rates of reaction, bonding, calculations, and organic chemistry. Visit: https://www.chemguide.co.uk/ 5. ChemSpider: ChemSpider is a free chemical database that allows you to search for chemical structures, properties, and related information. It can be helpful for exploring the properties and reactions of specific compounds. Visit: http://www.chemspider.com/ 6. Royal Society of Chemistry YouTube Channel: The Royal Society of Chemistry's YouTube channel features educational videos, demonstrations, and experiments related to chemistry. It can be a valuable visual resource to enhance your understanding of various topics. Visit: https://www.youtube.com/user/roysocchem. 7. Savemyexams: Source of topic notes and past paper questions 8. Physicsandmathstutor: Source of past paper questions 9. Century Tech 	
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