

Yardleys Curriculum Aims

- To achieve academic excellence
- To educate the 'whole child' so they are ready for life
- To work collaboratively and ethically to provide education of the highest standard

CHEMISTRY – KEY STAGE 4

Curriculum Overview

INTENT: Science helps students gain an understanding of the world around them, from the micro-level of particles and atoms to the macro-level of our expanding universe. It encourages students to question and enquire in order to learn more. We want our students to acquire the scientific knowledge and skills to meet their academic, practical and “real life” challenges of the future.

Year 9

The Year 9 chemistry curriculum will commence with knowledge build up from Key Stage 3, involving the study of matter and separating mixtures. This will be linked into the concept of particles from key stage three, which will be built upon with the knowledge of atomic structure, bonding and properties of substances and the development of the periodic table through time. Trends and patterns will be studied for groups in the periodic table. Chemical reactions involving balanced symbol equations will be reinforced and built upon from key stage three and the year will conclude with calculations involving mass using balanced symbol equations.

	Matter and Separating Mixtures	Atoms, Periodic Table, Ionic Bonding and Properties	Covalent, Metallic Bonding with Properties	Formulas, Equations and Groups in the Periodic Table	Calculations Involving Masses
SUBSTANTIVE KNOWLEDGE	<ul style="list-style-type: none"> • Matter and Mixtures • Separating Mixture Techniques 	<ul style="list-style-type: none"> • Atomic Structure • Development of the Periodic Table • Bonding and Properties (Ionic Substances) 	<ul style="list-style-type: none"> • Bonding and Properties (Covalent and Metallic Substances) 	<ul style="list-style-type: none"> • Formulas and Equations • Groups in the Periodic Table 	<ul style="list-style-type: none"> • Key Calculations involving masses
DISCIPLINARY KNOWLEDGE	<ul style="list-style-type: none"> • Interpreting data • Identify possible errors in investigations • Applying mathematical concepts 	<ul style="list-style-type: none"> • Using mathematical concepts • Applying scientific knowledge to experimental evidence 	<ul style="list-style-type: none"> • Applying scientific knowledge to experimental evidence • Make observations 	<ul style="list-style-type: none"> • Applying scientific knowledge to experimental evidence 	<ul style="list-style-type: none"> • Using mathematical concepts

	<ul style="list-style-type: none"> Suggesting improvements to scientific methods 				
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Year 10

The Year 10 chemistry curriculum reinforces acids and alkali reactions from key stage three but linked to making salts and purifying the salts as a knowledge build up. The learning of salts is then linked to electrolysis of salts and the purpose of separating salts into their components. As chemical reactions have been covered in key stage three, rates of reaction and energy changes are studied in more detail including factors which affect the rate of reactions. This leads on to studying metal extraction and displacement reactions which is linked to rate of reactions and electrolysis. Factors of rate of reaction are then linked into the concepts of dynamic equilibrium, with further exploration of how these factors affect equilibrium and rate of attainment of equilibrium.

	Chemical Changes 1 (Acids, Alkalis and Salts)	Chemical Changes 2 (Electrolysis)	Rates and Energy Changes	Metals and Extraction	Chemical Equilibria
SUBSTANTIVE KNOWLEDGE	<ul style="list-style-type: none"> Acids, Bases and Neutralisation Making soluble and insoluble salts 	<ul style="list-style-type: none"> Electrolysis 	<ul style="list-style-type: none"> Collision theory and rates Energy Changes 	<ul style="list-style-type: none"> Metal Reactions Metal Extraction Recycling Metals 	<ul style="list-style-type: none"> Chemical Equilibrium Chemical Cells and Fuel Cells
DISCIPLINARY KNOWLEDGE	<ul style="list-style-type: none"> Use scientific knowledge to experimental evidence Use appropriate apparatus when conducting experiments Use mathematical concepts 	<ul style="list-style-type: none"> Use scientific knowledge to experimental evidence Use appropriate apparatus when conducting experiments 	<ul style="list-style-type: none"> Use scientific knowledge to experimental evidence Use appropriate apparatus when conducting experiments Use mathematical concepts 	<ul style="list-style-type: none"> Observe experimental evidence Use scientific knowledge to make predictions Evaluate evidence using scientific knowledge 	<ul style="list-style-type: none"> Observe experimental evidence Use scientific knowledge to make predictions Evaluate evidence using scientific knowledge

Year 11

The Year 11 chemistry curriculum will mainly focus on aspects of organic chemistry and making links into how organic molecules are used and interact with the environment and the atmosphere. We commence by studying the hydrocarbons and crude oil chemistry and relating this to Earth science, including pollutants and how these affect the environment, making various links to global climate change and the evolution of the Earth's early atmosphere. Some organic molecules can undergo analytical tests, and this is linked to testing different ions with practical elements. Further organic molecules are explored including alcohols, carboxylic acids and esters and these are linked to different materials and their properties. We conclude the curriculum by making synoptic links using revision strategies.

	Quantitative Analysis Fuels and Earth Science	Qualitative Analysis and Hydrocarbons	Organic Chemistry and Materials	Synoptic Links and Revision	
SUBSTANTIVE KNOWLEDGE	<ul style="list-style-type: none"> Hydrocarbons and Crude Oil Chemistry Earth Science 	<ul style="list-style-type: none"> Ions testing and Organic Chemistry 	<ul style="list-style-type: none"> Organic Chemistry Continued Materials, Uses and Properties 	<ul style="list-style-type: none"> Synoptic Links Revision 	

<p style="text-align: center;">DISCIPLINARY KNOWLEDGE</p>	<ul style="list-style-type: none"> • Observe experimental evidence • Use scientific knowledge to make predictions 	<ul style="list-style-type: none"> • Observe experimental evidence • Use scientific knowledge to make predictions 	<ul style="list-style-type: none"> • Use scientific knowledge to experimental evidence • Use models to demonstrate scientific knowledge • Observe experimental evidence • Evaluate evidence using scientific knowledge 	<ul style="list-style-type: none"> • Use scientific knowledge to experimental evidence • Use models to demonstrate scientific knowledge • Observe experimental evidence • Use mathematical concepts 	
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