

## Curriculum Summary

**Subject:** Chemistry

Year 7	Year 8	Year 9	Year 10	Year 11
<p style="text-align: center;"><b><u>Particles</u></b></p> <p>Describing states of matter and explaining how they can change. Identifying the laws of diffusion and gas pressure. Understanding the nature of a solution and explaining how such mixtures might be separated.</p>	<p style="text-align: center;"><b><u>The Periodic Table</u></b></p> <p>Further analysing the structure of the atom with a focus on charge. Reviewing how the periodic table was developed and how it is used. Analysing the atomic structures and patterns in reactivity.</p>	<p style="text-align: center;"><b><u>Atomic Structure</u></b></p> <p>Describing the basic structure and electronic configuration of atoms and exploring how and why the atomic model has changed over time. Identifying atoms from formulae, writing word and balancing symbol equations.</p>	<p style="text-align: center;"><b><u>Electrolysis</u></b></p> <p>Describing electrolysis of molten ionic compounds, aqueous solutions and in extracting metals. Predicting the products of electrolysis and writing half equations. Planning an investigation on the electrolysis of aqueous solutions.</p>	<p style="text-align: center;"><b><u>Polymers</u></b></p> <p>Explain and compare the basic properties of addition and condensation polymerisation. Describing natural polymers such as starch, cellulose, protein and DNA whilst making cross-curricular links to Biology.</p>
<p style="text-align: center;"><b><u>Chemical Reactions</u></b></p> <p>Understanding the basic structure of atoms and using chemical formulae. Defining chemical reactions such as neutralisation, decomposition, displacement, exothermic and endothermic and explaining conservation of mass.</p>	<p style="text-align: center;"><b><u>Earth and Materials</u></b></p> <p>Describing how the Earth's atmosphere has evolved. Explaining how fossil fuels were formed and linking this to the fractional distillation, the greenhouse effect, global warming, atmospheric pollutants and ultimately, climate change.</p>	<p style="text-align: center;"><b><u>The Periodic Table</u></b></p> <p>Describing the structure of the modern periodic table and explaining why Newlands' idea of octaves was incomplete. Gaining an in-depth appreciation of how new experimental evidence may lead to a new scientific model. Explaining the trends of reactivity in each group, applying prior knowledge of electron configuration.</p>	<p style="text-align: center;"><b><u>Chemical Calculations</u></b></p> <p>Calculating relative formula/molecular mass. Describing what is meant by the chemical amount 'mole' and how we can use moles to calculate the theoretical yield of a chemical reaction in industry. Calculate percentage yield and atom economy of reactions used in industry including methods of producing ethanol.</p>	<p style="text-align: center;"><b><u>Chemical Analysis</u></b></p> <p>The study of analytical chemistry shows how chemistry is applied in different contextual environments outside of the school laboratory, whether it is forensic scientists in a police station, chemists running blood tests in a hospital or anti-doping scientists at the Olympics.</p>
<p style="text-align: center;"><b>Chemistry is taught as part of timetabled Science lessons in Year 7 and 8.</b></p> <p style="text-align: center;"><b>Students study four units in each Science subject: Biology, Physics and Chemistry.</b></p>		<p style="text-align: center;"><b><u>Structure and Bonding</u></b></p> <p>Recapping states of matter and evaluating the use of models in science. Using new knowledge of atoms and the periodic table to describe ionic, covalent and metallic bonding and to explain the properties of the resulting structures. Describing the structures and applications of nanoparticles and evaluating their risks.</p>	<p style="text-align: center;"><b><u>Energy Changes</u></b></p> <p>Recapping the law of conservation of energy and making cross curricular links to Physics and Biology. Describing exothermic and endothermic reactions, explaining how to investigate energy changes and evaluating its real-world applications. Calculating energy transferred in chemical reactions when supplied with bond energies.</p>	<p style="text-align: center;"><b><u>The Earth's Atmosphere</u></b></p> <p>The importance of this topic has perhaps taken on even more significance in recent years with environmental issues high on the agenda. Analysing some of the solutions which chemists are currently working on and appreciating the role of peer-reviews.</p>
		<p style="text-align: center;"><b><u>Chemical Changes</u></b></p> <p>Analysing the reaction of metals with oxygen, water, dilute acid and displacement reactions in order to deduce an order of reactivity. Using this to explain why and how metals can be extracted from their ores. Practical skills are developed, and knowledge of calculations are applied during the required practical where a pure dry sample of a soluble salt is produced.</p>	<p style="text-align: center;"><b><u>Rates and Equilibrium</u></b></p> <p>Differentiating between kinetic and thermodynamic factors. Investigating four variables that can be manipulated to change the rate of reaction. Chemical reactions may also be reversible, and we investigate how altering conditions will affect the yield of the desired product.</p>	<p style="text-align: center;"><b><u>Using the Earth's resources</u></b></p> <p>Describe rusting and explain how it can be prevented. Interpreting and evaluating the composition and uses of alloys. Explaining the differences between thermosetting and thermosoftening polymers. Explaining why, now more than ever, nitrogen-based fertilisers are needed to improve crop yields and why the economics of the process must be considered.</p>
			<p style="text-align: center;"><b><u>Crude Oil and Fuels</u></b></p> <p>Describing the composition of crude oil, how it can be separated by fractional distillation and the uses of each fraction. Analysing the larger fractions and explaining how and why they must be cracked. Writing equations for the combustion of hydrocarbons.</p>	
	<p style="text-align: center;"><b><u>Organic Reactions</u></b></p> <p>Describing the reactions of alkenes and the structure of carboxylic acids, esters and alcohols. Describing how alcohols react and explaining some of their uses.</p>			