



Thomas Mills
High School & Sixth Form

KS4 Chemistry Curriculum Intent Statement (Year 10)

At Thomas Mills High School, Year 10 builds upon the foundations laid in Year 9 by advancing pupils' understanding of key GCSE Chemistry topics. This year is designed to develop a deeper grasp of chemical reactions, quantitative chemistry, and dynamic processes, enabling pupils to analyse and interpret real-world applications of Chemistry. The curriculum is sequenced to ensure pupils continue to grow as curious, confident, and capable scientists, equipped with the knowledge and skills needed for success in both examinations and future scientific study. Our intent is to:

Develop Scientific Knowledge and Understanding:

We aim to ensure that pupils build a strong understanding of chemical reactions, including the writing and interpretation of empirical, molecular, ionic, and half equations. They study redox changes and electrolysis in greater depth, learning how these processes are used in industrial and everyday contexts. As the year progresses, pupils explore quantitative aspects of Chemistry, such as yield, atom economy, and concentration, alongside dynamic systems including reversible reactions and chemical equilibria. These topics are embedded with practical relevance, highlighting the importance of efficient and sustainable chemical processes.

Curiosity, Inquiry and Skills Development:

Through a range of practical activities, demonstrations, and investigative tasks, pupils continue to refine their laboratory and analytical skills. They perform required practicals such as electrolysis and rate of reaction experiments, and develop fluency in chemical calculations, including balancing equations, determining percentage yield, and applying Le Chatelier's Principle. Pupils are encouraged to interpret data, construct and analyse graphs, and use enquiry-based approaches to explain patterns and evaluate outcomes in chemical processes.

Prepare for Future Learning:

Year 10 prepares pupils for the final phase of the GCSE Chemistry course in Year 11. By mastering both symbolic and numerical representations of chemical change, and by developing a secure understanding of how variables affect reaction outcomes, pupils are equipped for more advanced study in chemical analysis, energy changes, and organic chemistry. Throughout, real-world links to industry, environmental science, and sustainable development ensure pupils recognise the wider value and applications of Chemistry in modern society.

Year

10

Term

Topic

Knowledge and Skills

Useful Links



1	Name of topic/Topics 10C3 Chemical Reactions	Knowledge: Topics in bold are not required for Combined Science The Year 10 Chemical Reactions topic strengthens pupils' understanding of how substances interact and change at a chemical level. Pupils learn to write and interpret chemical formulae using empirical, molecular, and structural representations such as ball-and-stick models. They develop a systematic approach to balancing chemical equations, and Separate Chemistry pupils are introduced to ionic and half equations to describe redox processes in more detail. The unit also introduces the principles of redox reactions, including identifying oxidation and reduction in terms of electron transfer and changes in oxidation state. Electrolysis is studied in the context of both molten and aqueous solutions, with applications such as electroplating reinforcing real-world relevance. Pupils learn about the energy changes that take place during chemical reactions and the calculations associated with them.	Lesson: Bonding models Higher OCR KS4 Chemistry Oak National Academy Unit: Calculations involving masses KS4 Chemistry Oak National Academy Unit: Electrolysis KS4 Chemistry Oak National Academy The mole - Higher - The mole and Avogadro's constant - - BBC Bitesize
		Skills: Through modelling, structured practice, and practical investigations, pupils gain confidence in balancing equations, identifying ions and charges, and using ratio reasoning to describe chemical changes. Pupils apply their knowledge to analyse redox reactions and predict electrolysis products using observations and chemical understanding. They develop procedural competence in setting up and carrying out electrolysis experiments safely and effectively, and use chemical tests to confirm products such as gases. The unit also supports numeracy by reinforcing skills in interpreting formulae, calculating charge balance, and recognising patterns in chemical behaviour. Pupils are encouraged to apply their learning to broader environmental and industrial contexts, developing a deeper appreciation of chemistry's practical significance.	Investigating exothermic and endothermic reactions - Energetics - - BBC Bitesize Oxidation and reduction - Types of chemical reactions - - BBC Bitesize



Assessments	<p>A mid-unit low-stakes test and a more formal end-of-unit test completed under exam conditions. These assessments are designed to check understanding of key concepts and identify areas for improvement. Pupils receive feedback on both assessments, with time allocated in class to review answers and address misconceptions.</p> <p>Topic Summary Checklists are used throughout the unit to help pupils monitor their own progress and reflect on their understanding of the content.</p>	
2	Name of topic/Topics 10C5 Monitoring and Controlling Note that due to the amount of content, the C5 unit for separate science is normally taught across year 10 and year 11.	<p>Knowledge:</p> <p>The Monitoring and Controlling Chemical Reactions topic introduces pupils to the quantitative and dynamic aspects of chemical change. Pupils learn how to calculate percentage yield and atom economy, and explore the implications of these values for industrial and sustainable chemical processes. The concept of concentration is developed, including definitions, units, and (for Separate Chemistry pupils) the use of titration as a method for determining unknown concentrations. The unit also covers factors affecting the rate of chemical reactions—temperature, concentration, pressure, surface area, and catalysts—as well as the interpretation of data from rate experiments. Pupils are introduced to reversible reactions and dynamic equilibrium, applying Le Chatelier's Principle to predict how changes in conditions affect chemical systems.</p> <p>Skills:</p> <p>Pupils develop confidence in quantitative problem solving, using formulae to calculate yield, atom economy, and concentration, and converting between units accurately. They interpret and draw graphs to represent changes in reaction rate, and evaluate how experimental data supports theoretical explanations. Through practical investigations, pupils observe the effects of changing conditions on reaction rate and learn to plan and conduct fair tests. Separate Chemistry pupils also gain experience in titration techniques, developing precision in measurement and observation.</p>
		<p>Calculating the mass of product - Monitoring chemical reactions - - BBC Bitesize</p> <p>Converting units - Higher - Monitoring chemical reactions - Higher - - BBC Bitesize</p> <p>Rate of reaction - Controlling chemical reactions - - BBC Bitesize</p> <p>Reversible reactions - Equilibria - - BBC Bitesize</p> <p>Multiple choice questions - Sample exam questions - monitoring chemical reactions - - BBC Bitesize</p> <p>Unit: Rate of reaction KS4 Chemistry Oak National Academy</p>



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CURRICULUM OVERVIEW: Chemistry

		The topic encourages pupils to think critically about the efficiency, reversibility, and environmental impact of chemical processes—skills essential for further study and real-world scientific understanding.	Lesson: Chemical equilibrium Foundation OCR KS4 Chemistry Oak National Academy
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