



love the journey

## Curriculum Implementation 2023-24

### Secondary

<b>LCA Strand</b>	<b>Science</b>
<b>Subject</b>	<b>Chemistry</b>
<b>Key Stage</b>	<b>Key Stage 5 (Chapter 12-13)</b>

What are the key concepts taught?	<p>A Level chemistry attempts to answer the big question 'what is the world made of' and it's the search for this answer that makes this subject so fascinating. From investigating how one substance can be changed drastically into another, to researching a new wonder drug to save millions of lives, the opportunities that chemistry provides are endless. A level Chemistry aims to consolidate and extend learning of themes from the GCSE course and develop these further, piquing interest in new and exciting areas of research (such as; Shapes of molecules, organic synthesis/analysis, electrochemical cells and analytical techniques to analyse and interpret substances). Deepening understanding of established topics (such as Atomic structure and the Periodic Table (periodicity), bonding, energetics, rates and organic chemistry) and strengthening the links between key concepts, leading on to larger overarching topics that may span across a number of other subject areas such as Biology, Physics, Maths, PE, Technology and Engineering.</p>
-----------------------------------	---

What is the sequencing of units?	<p><b>Chapter 12</b> Simple links include Chapter 12 Energetics moving on to Chapter 13 thermodynamics and An introduction to Organic Chemistry moving on to alkanes alkenes and alcohols and then, in Chapter 13, developing further to esters and aromatic chemistry</p> <p>Atomic Structure • Bonding • Introduction to Organic Chemistry • Amount of Substance • Energetics Alkanes • Halogenoalkanes • Alkenes • Alcohols • Oxidation, reduction and redox equations Organic Analysis • Periodicity, Group 2 and Group 7 • Optical Isomers • Aldehydes and Ketones • Thermodynamics</p> <p><b>Chapter 13</b> Carboxylic acids and derivatives • Aromatic chemistry • Amines • Polymers • Rate equations and K<sub>p</sub> • Period 3 elements •</p>
----------------------------------	--

	<p>Transition metals and reactions of ions in aqueous solutions  Amino acids, proteins and DNA • NMR • Chromatography •  Organic analysis • Electrode potentials and electrochemical cells •  Acids and bases</p>
--	---

<p>How do we encourage pupils to see the links between different units and concepts?</p>	<p>The course is split into 6 modules/Key ideas:</p> <ul style="list-style-type: none"> <li>• Development of practical skills in chemistry</li> <li>• Foundations in chemistry (atomic structure, moles and bonding etc</li> <li>• Periodic table and energy</li> <li>• Core organic chemistry</li> <li>• Physical chemistry and transition elements</li> <li>• Organic chemistry and analysis</li> </ul> <p>Each sub topic is revisited throughout Chapter 10 and 11. For example the concept of moles introduced at GCSE is used in all numerical sub topics such as Kinetics and Thermodynamics</p> <p>Retrieval tasks are planned to review linked content learnt previously to allow students to internalise the connections between the different topics and skills.</p>
--	--

<p>What are the planned opportunities for adaptive teaching, including for SEND, the more able and disadvantaged pupils?</p>	<p>Support is offered in Science through:</p> <ul style="list-style-type: none"> <li>• Scaffolding and modelling.</li> <li>• Questioning.</li> <li>• Practising of skills.</li> <li>• Practise of examination questions.</li> </ul> <p>There is a focus throughout on preparation for the rigour of A level exams. Teachers ensure they are familiar with individual pupil profiles and plan and adapt their teaching accordingly taking these into account. Interventions include:</p> <p>Stretch and challenge for the most able students is planned with the use of extended research tasks, preparation for Oxbridge entrance exams, and we also regularly enter students in the Cambridge Chemistry Challenge in Chapter 12.</p>
--	---

<p>What are the planned opportunities for retrieval and reflection by pupils?</p>	<p>LC tests/quizzes/whiteboard activities.</p> <p>Peer/self-assessed to provide immediate feedback. Planned, targeted retrieval starters which return to previously learnt content at regular intervals, as well as cumulative assessment in both low stakes assessments and PP exams throughout the year. Starter questions and home learning tasks will revisit material. Research home learning tasks support preparation for lessons</p>
---	--

<p>What are the opportunities for feed forward by the teacher post assessment outcomes?</p>	<p>Analysis of examiners reports to identify areas of concern, patterns in misunderstanding/misconceptions and additions/amendments made to SoW on an annual basis.</p> <p>Analysis of mock exams to identify areas of concern to focus on during revision lessons towards the end of Chapter 13 on a class by class basis.</p> <p>Teachers act on errors and misconceptions demonstrated in assessments and in class and adapt content of future lessons to review skills and knowledge as needed.</p>
---	---

<p>What are the planned opportunities for developing Reading?</p>	<p>Students reading aloud from textbooks. Literacy tasks in lessons/ homework research tasks: reading a passage followed by comprehension designed to develop readers ability to read confidently.</p> <p>Reading lists relevant to KS3/4/5 are shared with pupils, as well as suggestions shared with school library for new book purchases</p>
---	--

<p>What are the planned opportunities for developing literacy, numeracy, oracy and SMSC?</p>	<p>Students learn the difference in using scientific and common usage vocabulary. We discuss the differences in the use of terms concentration and strength in science and everyday language Maths skills and working scientifically skills are communicated to students at the start of a new topic. Numeracy is developed regularly as quantitative chemistry is interleaved throughout Chapter 10 and 11. Appropriate units in calculations, use of expressions in decimal and ordinary form, use of ratios, fractions and percentages, estimation of results, use of calculators to find the powers, exponentials and logarithmic functions, use of appropriate numbers of significant figures, finding arithmetic means, identification of uncertainties, use of the equilibrium sign, changing the subject of an equation, substitution of numerical values into algebraic equations, solving algebraic equations, using logarithms in relation to quantities that range over several magnitudes, translate information between graphical, numerical and algebraic forms, plotting variables from experimental or tabular data, determination of the slope and intercept of a linear graph, calculation of the rate of change from a graph, use of tangents to a curve, use of angles and shapes in 2D and 3D structures, symmetry of 2D and 3D shapes.</p> <p>Consistent focus on answering exam style questions to develop literacy. Understanding how to answer them using the mark scheme.</p> <p>Opportunities to work with younger students and run practical experiments during Open Evening. Students able to work in small groups in lessons and discuss answers / methodology.</p>
--	--