



Topic name	Term	Skills developed	Link to NC subject content	Prior knowledge	Next link in curriculum
Introduction to Chemistry	Autumn	<ul style="list-style-type: none"><li>Estimating risks</li><li>Test hypotheses</li><li>Collecting data</li><li>Presenting data</li><li>Draw conclusions</li><li>Constructing explanations</li></ul>	<p><b>Working Scientifically</b></p> <p><b>Scientific Attitudes</b></p> <ul style="list-style-type: none"><li>pay attention to objectivity and concern for accuracy, precision, repeatability and reproducibility</li><li>understand that scientific methods and theories develop as earlier explanations are modified to take account of new evidence and ideas, together with the importance of publishing results and peer review</li><li>evaluate risk</li></ul> <p><b>Experimental skills and investigations</b></p> <ul style="list-style-type: none"><li>ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience</li><li>make predictions using scientific knowledge and understanding</li><li>select, plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent and control variables</li><li>use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety</li><li>make and record observations and measurements using a range of methods for different investigations; and evaluate</li></ul>	<p><b>Prior Knowledge from KS2</b></p> <p>Students should have some ideas on scientific investigations from KS2.</p> <p>This introduction topic aims to establish a solid baseline of skills across all of our students upon which to build subsequent core knowledge and skills.</p>	<p><i>These skills are applied to and developed across their entire WKGS science career</i></p> <p>Links to GCSE:</p> <ul style="list-style-type: none"><li>Working scientifically section 3 of the AQA specification</li></ul>



			<p>the reliability of methods and suggest possible improvements</p> <ul style="list-style-type: none"><li>• apply sampling techniques</li></ul> <p><b>Analysis and evaluation</b></p> <ul style="list-style-type: none"><li>• apply mathematical concepts and calculate results</li><li>• present observations and data using appropriate methods, including tables and graphs</li><li>• interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions</li><li>• present reasoned explanations, including explaining data in relation to predictions and hypotheses</li><li>• evaluate data, showing awareness of potential sources of random and systematic error</li><li>• identify further questions arising from their results</li></ul> <p><b>Measurement</b></p> <ul style="list-style-type: none"><li>• understand and use SI units and IUPAC (International Union of Pure and Applied Chemistry) chemical nomenclature</li><li>• use and derive simple equations and carry out appropriate calculations</li><li>• undertake basic data analysis including simple statistical techniques</li></ul>		
--	--	--	---	--	--



<p><b>Particles</b></p>	<p><i>Spring</i></p>	<ul style="list-style-type: none"> <li>Analyse patterns</li> <li>Review theories</li> <li>Discuss limitations</li> <li>Test hypotheses</li> <li>Draw conclusions</li> <li>Construct explanations</li> <li>Collect data</li> <li>Present data</li> </ul>	<ul style="list-style-type: none"> <li>The properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure.</li> <li>Changes of state in terms of the particle model.</li> <li>Changes with temperature in motion and spacing of particles.</li> <li>The differences in arrangements, in motion and in closeness of particles explaining changes of state, shape and density, the anomaly of ice-water transition.</li> <li>Atoms and molecules as particles.</li> <li>Diffusion in terms of the particle model</li> </ul>	<p><b>Prior Knowledge from KS2</b></p> <p>Students should be able to:</p> <p>Compare and group materials together, according to whether they are solids, liquids or gases</p> <p>Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature</p>	<ul style="list-style-type: none"> <li>Y8 Autumn: Elements, mixtures and compounds</li> </ul> <p>Links to GCSE Topic 1 – <b>Atomic Structure and the Periodic Table</b></p> <p><b>Year 9:</b></p> <ul style="list-style-type: none"> <li>Mixtures</li> <li>Development of the atomic model</li> </ul> <p>Links to GCSE Topic 2 – <b>Structure and Bonding</b></p> <p><b>Year 9:</b></p> <ul style="list-style-type: none"> <li>The three states of matter</li> <li>State symbols</li> </ul>
<p><b>Acids &amp; Alkalis</b></p>	<p><i>Summer</i></p>	<ul style="list-style-type: none"> <li>Estimating risks</li> <li>Test hypotheses</li> <li>Collecting data</li> <li>Presenting data</li> <li>Draw conclusions</li> </ul>	<ul style="list-style-type: none"> <li>Acids have a pH below 7, neutral solutions have a pH of 7, alkalis have a pH above 7.</li> <li>Acids and alkalis can be corrosive or irritant and require safe handling</li> <li>The pH of a solution depends on the strength of the acid: strong acids have lower pH values than weak acids.</li> </ul>	<p><b>Prior Knowledge from KS2</b></p> <p>Students should be able to:</p> <p>Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda</p> <ul style="list-style-type: none"> <li></li> </ul>	<ul style="list-style-type: none"> <li>Y8 Spring: Chemical reactions</li> </ul> <p>Links to GCSE Topic 4 – <b>Chemical Changes</b></p> <p><b>Year 9:</b></p> <ul style="list-style-type: none"> <li>Reactions of metals and acids</li> <li>Neutralisation</li> <li>Acids and Alkalis</li> </ul>



	<ul style="list-style-type: none"><li>• Constructing explanations</li><li>• Justifying opinions</li></ul>	<ul style="list-style-type: none"><li>• Identifying the best indicator to distinguish between solutions of different pH, using data provided.</li><li>• Using data and observations to determine the pH of a solution and explain what this shows.</li><li>• Defining acids and alkalis in terms of neutralisation reactions.</li><li>• Explaining how neutralisation reactions are used in a range of situations. Describe a method for how to make a neutral solution from an acid and alkali</li><li>• Reactions of acids with alkalis to produce a salt plus water</li><li>• Reactions of acids with metals to produce a salt plus hydrogen</li></ul>		<p>Year 11:</p> <ul style="list-style-type: none"><li>• Strong and weak acids</li><li>• Titrations</li></ul>
--	---	---	--	--