



Topic name	Term	Skills developed	Link to NC subject content	Prior knowledge	Next link in curriculum
Introduction to Chemistry and Acids and Alkalis	<i>Autumn - Spring</i>	- Estimating risks - Test hypotheses - Collecting data - Presenting data - Draw conclusions - Constructing explanations	Working Scientifically Scientific Attitudes - pay attention to objectivity and concern for accuracy, precision, repeatability and reproducibility - 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 - evaluate risk Experimental skills and investigations - ask questions and develop a line of enquiry based on observations of the real world, alongside prior knowledge and experience - make predictions using scientific knowledge and understanding - select, plan and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent and control variables - use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety - make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements - apply sampling techniques	Prior Knowledge from KS2 Students should have some ideas on scientific investigations from KS2. 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. 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	<i>These skills are applied to and developed across their entire WKGS science career</i> Links to GCSE: - Working scientifically section 3 of the AQA specification - Y8 Spring: Chemical reactions Part 1 Links to GCSE Topic 4 – Chemical Changes Year 10: - Reactions of metals and acids - Neutralisation - Acids and Alkalis Year 11: - Strong and weak acids - Titration



			Measurement • understand and use SI units and IUPAC (International Union of Pure and Applied Chemistry) chemical nomenclature • use and derive simple equations and carry out appropriate calculations • undertake basic data analysis including simple statistical techniques Acids and Alkalis • Acids have a pH below 7, neutral solutions have a pH of 7, alkalis have a pH above 7. • Acids and alkalis can be corrosive or irritant and require safe handling • The pH of a solution depends on the strength of the acid: strong acids have lower pH values than weak acids. • Identifying the best indicator to distinguish between solutions of different pH, using data provided. • Using data and observations to determine the pH of a solution and explain what this shows. • Defining acids and alkalis in terms of neutralisation reactions.		
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			• 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 • Reactions of acids with alkalis to produce a salt plus water • Reactions of acids with metals to produce a salt plus hydrogen		
Particles	<i>Spring - Summer</i>	• Analyse patterns • Review theories • Discuss limitations • Test hypotheses • Draw conclusions	• The properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure. • Changes of state in terms of the particle model. • Changes with temperature in motion and spacing of particles. • The differences in arrangements, in motion and in closeness of particles explaining changes of state, shape and density, the anomaly of ice-water transition.	Prior Knowledge from KS2 Students should be able to: Compare and group materials together, according to whether they are solids, liquids or gases Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this	• Y7 Summer Separating Mixtures • Y8 Autumn: Elements, mixtures and compounds Links to GCSE Topic 1 – Atomic Structure and the Periodic Table Year 10: • Mixtures



		- Construct explanations - Collect data - Present data	- Atoms and molecules as particles. - Diffusion in terms of the particle model	happens in degrees Celsius (°C) Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature	- Development of the atomic model Links to GCSE Topic 2 – Structure and Bonding Year 10: - The three states of matter - State symbols
Separating Mixtures	<i>Summer</i>	- Collecting data - Analyse patterns - Review theories - Draw conclusions - Make observations - Estimate risks - Plan variables - Test hypotheses - Construct explanations - Discuss limitations	- Mixtures, including dissolving and solubility - Using techniques for separating mixtures: filtration, evaporation, distillation and chromatography - Evaluating techniques for separating mixtures: filtration, evaporation, distillation and chromatography - The identification of pure substances	Prior Knowledge from KS2 Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating	- Y9 Autumn Introduction to bonding Links to GCSE Topic 1 – Atomic structure & the Periodic Table Year 10: - Separating mixtures Links to GCSE Topic 8 – Chemical Analysis Year 10: - Pure and impure substances