



Topic name	Term	Skills developed	Link to subject content	Prior learning	Next link in curriculum
Atomic Structure	Autumn	<ul style="list-style-type: none"><li>MS 1.1 Students report calculations to an appropriate number of significant figures, given raw data quoted to varying numbers of significant figures.</li><li>MS 1.2 Students calculate weighted means eg calculation of an atomic mass based on supplied isotopic abundances.</li><li>MS 3.1 Students interpret and analyse spectra.</li></ul>	<ul style="list-style-type: none"><li>Atomic Structure</li><li>Electron configuration and energy level diagrams</li><li>ToF Mass Spectrometry</li><li>Trends in ionisation energies</li></ul>	GCSE  4.1 Atomic Structure and the Periodic Table  4.2 Chemical Analysis	<ul style="list-style-type: none"><li>3.2.5 Transition Metals (Y13) Redox Titration Calculations</li><li>3.2.1 Periodicity</li><li>3.3.6 Organic Analysis</li></ul>
Bonding	Autumn	<ul style="list-style-type: none"><li>PS 1.1 Students could be asked to find the type of structure of unknowns by experiment</li><li>MS 0.3 and 4.1 Students could be given familiar and unfamiliar examples of species and asked to deduce the shape according to valence shell electron pair repulsion (VSEPR) principles.</li></ul>	<ul style="list-style-type: none"><li>Ionic bonding</li><li>Nature of covalent and dative covalent bonds</li><li>Metallic bonding</li><li>Bonding and physical properties</li><li>Shapes of Molecules</li><li>Bond polarity</li><li>Intermolecular forces</li></ul>	GCSE  4.1 Atomic structure and the Periodic Table  4.2 Structure and Bonding	<ul style="list-style-type: none"><li>3.2.4 Period 3 and their oxides (Y13) When discussing melting and boiling points of Period 3 and their oxides in relation to their structure.</li><li>3.2.5 Transition Metals (Y13) When discussing shapes of complex ions.</li></ul>



Energetics	Spring	<ul style="list-style-type: none"><li>MS 0.0 <b>Recognise and make use of appropriate units in calculation</b></li><li>Practical Skills 2.4, 3.1, 3.2, 3.3 and 4.1</li><li>MS 2.4 Students carry out Hess's law calculations.</li><li>AT a and k PS 2.4, 3.2 and 4.1 Students could be asked to find <math>\Delta H</math> for a reaction using Hess's law and calorimetry, then present data in appropriate ways.</li></ul> <p>Required practical 2 Measurement of an enthalpy change.</p>	<ul style="list-style-type: none"><li>Enthalpy change (<math>\Delta H</math>)</li><li>Calorimetry</li><li>Applications of Hess's law</li><li>Bond enthalpies</li></ul>	GCSE  4.4 Chemical Changes  4.5 Energy Changes	3.3.8 Thermodynamics
Kinetics	Spring	<ul style="list-style-type: none"><li>AT a, b, k and l PS 2.4 and 3.1 Students could investigate the effect of temperature on the rate of reaction</li><li>AT a, e, k and i Students could investigate the effect of changing the concentration of acid</li></ul>	<ul style="list-style-type: none"><li>Collision Theory</li><li>Maxwell-Boltzmann Distribution</li><li>Effect of temperature on reaction rate</li><li>Effect of concentration and pressure</li><li>Catalysts</li></ul>	GCSE  4.5 Energy changes  4.6 Rates of Reaction	3.2.5 Transition metals



		on the rate of a reaction.			
Chemical Equilibria, Le Chatelier's Principle and Kc	Summer	<ul style="list-style-type: none"><li>MS 0.3 Students estimate the effect of changing experimental parameters on a measurable value</li><li>MS 1.1 Students report calculations to an appropriate number of significant figures.</li><li>MS 2.2 and 2.3 Students calculate the concentration of a reagent at equilibrium. Students calculate the value of an equilibrium constant Kc</li></ul> Required practical 3 Investigation of how the rate of a reaction changes with temperature.	<ul style="list-style-type: none"><li>Chemical equilibria and Le Chatelier's principle</li><li>Equilibrium constant Kc for homogeneous systems</li></ul>	GCSE 4.6 Rate of reaction 4.10 Using Resources	<ul style="list-style-type: none"><li>3.1.10 Equilibrium Constant Kp for homogenous systems (Y13)</li></ul>



<i>Oxidation, Reduction and Redox Equations.</i>	Summer		<ul style="list-style-type: none"><li>• Oxidation and reduction</li><li>• Oxidation states</li><li>• Redox equations</li></ul>	GCSE  4.4 Chemical Changes	<ul style="list-style-type: none"><li>• 3.2.5 Transition Metals (Y13) Variable Oxidation states of transition metals.</li></ul>
<b>Group 7- The Halogens.</b>	Summer	<ul style="list-style-type: none"><li>• AT d and k PS 2.2</li></ul> Required practical 4 Carry out simple test-tube reactions to identify: Cations – Group 2, NH <sub>4</sub> <sup>+</sup> + Anions – Group 7 (halide ions), OH <sup>-</sup> , CO <sub>3</sub> <sup>2-</sup> , SO <sub>4</sub> <sup>2-</sup>	<ul style="list-style-type: none"><li>• Trends in properties</li><li>• Uses of chlorine and chlorate(I)</li></ul>	GCSE  4.1 Atomic Structure & The Periodic Table  A Level  3.1.7 Redox	<ul style="list-style-type: none"><li>• 3.2.1 Periodicity.</li></ul>
<b>Periodicity</b>	Summer		<ul style="list-style-type: none"><li>• Classification</li><li>• Physical properties of period 3 elements</li></ul>	GCSE  4.1 Atomic Structure & The Periodic Table  4.2 Structure & Bonding	<ul style="list-style-type: none"><li>• 3.2.1 Period 3 and their Oxides (Y13)</li></ul>