

Year 12 Chemistry

	Half term 1	Half term 2	Half term 3	Half term 4	Half term 5	Half term 6
	<p>Content delivered: Unit 2.1: Isotopes Atomic structure RAM Ionic formulae Balancing equations Avogadro's number Empirical formulae Ideal gas equation Stoichiometric relationships Unit 4.1: Application of IUPAC Types of formulae Movement of electron pairs Diploes</p>	<p>Content delivered: Unit 2.1: Percentage yield Atom economy Formulae of acids and alkalis Dissociations in acids Neutralisation Preparing standard solutions Acid-base titrations Titration calculations Oxidation numbers Redox Unit 4.1: Alkanes Tetrahedral shapes Bond angles Dipole-dipole interactions Reactivity of alkanes Combustion of alkanes Radical substitution Alkenes Trigonal planar shapes Stereoisomerism Unit 2.2: Electron configurations Orbitals Order of filling orbitals Ionic bonding as electrostatic attraction Giant ionic lattices Structure and physical properties of ionic compounds Covalent bonding (single, multiple and dative)</p>	<p>Content delivered: Unit 2.2: Shapes and bond angles Electron pair repulsion Electronegativity Polar bonds Hydrogen bonding Anomalous properties of water Structure and bonding in covalent compounds Unit 4.1: Reactivity of alkenes Addition reactions in alkenes Electrophilic addition by heterolytic fission Markownikoff's rule Addition polymerisation Sustainability of processing waste polymers Unit 4.2: Polarity of alcohols Classification of alcohols Combustion of alcohols Oxidation of alcohols Eliminating water from alcohols Unit 3.1: Periodic table Ionisation energies Metallic bonding Physical properties of giant metallic and giant covalent lattices Variations in melting points Trends in reactivity Reactivity of group 2 Halogens as diatoms</p>	<p>Content delivered: Unit 3.1: Group 7 electron configuration Group 7 trends in reactivity Disproportionation Using chlorine in water treatment Precipitation reactions Qualitative analysis of ions Unit 4.2: Hydrolysis of haloalkanes Mechanism of nucleophilic substitution in hydrolysis Trends in rates of hydrolysis Halogen radicals Quickfit Identification of functional groups Unit 3.2: Enthalpy Standard conditions Enthalpy change of formation Enthalpy change of reaction Enthalpy change of combustion Enthalpy change of neutralisation $q = mc\Delta T$</p>	<p>Content delivered: Unit 3.2: Average bond enthalpy Hess' law Determining enthalpy change directly and indirectly Factors affecting rate Calculating reaction rate Homogenous and heterogeneous catalysts Boltzmann distribution Dynamic equilibrium Le Chatelier's principle Unit 4.2: Synthetic routes for preparing organic compounds IR radiation and covalent bonds Absorption of IR radiation by atmospheric gases</p>	<p>Content delivered: Unit 3.2: Use of catalysts Equilibrium constant Estimating position of equilibrium Unit 4.2: Interpreting the IR spectrum Monitoring air pollution using IR spectroscopy Using mass spec Analysing fragmentation peaks Structures of organic compounds</p>
<p>Key Words Level 2 Level 3</p>	<p>2.1: Atomic number, isotope, neutron, proton, electron, relative abundance, relative atomic mass, relative isotopic mass, relative molecular mass, mass spectrometer/y, relative isotopic mass, compound ion, state symbol, nitrate, sulfate, phosphate, hydroxide, mole, balancing, Avogadro's Constant, ideal gas, 4.1: Hydrocarbon, homologous series, alkane, alkene, alkyl, alicyclic, saturated, unsaturated, isomer/ism, structural isomer, organic compound, displayed/structural/skeletal molecular formula(e)</p>	<p>2.1: Acid, base, alkali, titration, neutralisation, burette, pipette, oxidation, reduction, redox 4.1: Curly arrow, reaction mechanism, substitution reaction, Radical, initiation, propagation, termination, addition, heterolytic, homolytic, isomerism, electrophile, primary, secondary, tertiary, CIP, Markownikoff 2.2: Electron configuration, shell, sub-shell</p>	<p>2.2: Enthalpy, bonding pair, lone pair, dative covalent bond, intermolecular forces, dipole, dispersion, polar, non-polar, electronegativity, enthalpy 4.1: Addition, heterolytic, homolytic, isomerism, electrophile, primary, secondary, tertiary, CIP, Markownikoff 4.2: Primary, secondary, tertiary, oxidation, combustion, aldehyde, ketone, carboxylic acid 3.1: Electron configuration, ionisation energy, atomic radius, shielding, lattice, electrostatic</p>	<p>3.1: Atomic radius, shielding, lattice, electrostatic, base, oxidation, reduction, diatomic, electronegativity, disproportionation, redox, precipitation, intermolecular forces, 4.2: Primary, secondary, tertiary, oxidation, combustion, aldehyde, ketone, carboxylic acid, addition, elimination, substitution, hydrolysis, reflux, distillation, liebig condenser, separating funnel 3.2: Enthalpy, lattice enthalpy, enthalpy of formation, enthalpy of combustion, enthalpy of solution, Born-Haber cycle, electron affinity,</p>	<p>3.2: Enthalpy, lattice enthalpy, enthalpy of formation, enthalpy of combustion, enthalpy of solution, Born-Haber cycle, electron affinity, Boltzmann, gradient, tangent, collision theory, homogeneous, heterogeneous, catalyst, activation energy 4.2: Primary, secondary, tertiary, oxidation, combustion, aldehyde, ketone, carboxylic acid, addition, elimination, substitution, hydrolysis, reflux, distillation, liebig condenser, separating funnel, fragmentation, fragment ion, M peak, M+1 Peak</p>	<p>3.2: Boltzmann, gradient, tangent, collision theory, homogeneous, heterogeneous, catalyst, activation energy, dynamic equilibrium, compromise, homogeneous equilibrium, Le Chatelier's principle, 4.2: Fragmentation, fragment ion, M peak, M+1 Peak</p>
<p>Where previous knowledge has occurred and future development KS2 → KS3 → KS4 → KS5</p>	<p>KS2: Properties of materials KS3: Composites, Polymers and Ceramics KS4: Organic chemistry, the atom KS5:</p>	<p>KS2: Solids, liquids and gases KS3: Acids and alkalis, chemical reactions KS4: Quantitative chemistry, the atom KS5:</p>	<p>KS2: Changes of state KS3: Metals and non-metals, periodic table KS4: Organic chemistry, bonding, the atom KS5:</p>	<p>KS2: Changes of state KS3: Chemical reactions, physical and chemical changes KS4: The atom, energy changes, organic chemistry KS5:</p>	<p>KS2: Drawing graphs KS3: Chemical reactions KS4: Energy changes, rates, organic chemistry KS5:</p>	<p>KS2: Drawing graphs KS3: Digestion KS4: Chemical analysis, rates, organic chemistry KS5:</p>
<p>Common Misconceptions</p>	<p>2.1: Compound ions 4.1: Naming from the wrong end</p>	<p>2.1.: Moles due to dissociations 2.2: Oxidising agents/oxidised 4.1: Intermolecular and intramolecular forces</p>	<p>2.2: Identifying IM forces 4.1: conservation of charge 4.2: identifying reaction types 3.1: Difference between base and alkali</p>	<p>3.1: Miscalculating ox. nos 4.2: Reversing the order of reactivity of halogens 3.2: Identifying types of enthalpy</p>	<p>3.2: Confusing the – and + in the equation 4.2: Confusing peaks and troughs</p>	<p>3.2: Construction of Kc 4.2: Constructing molecules from fragments</p>
<p>Literacy</p>	<p>Scientific writing (HSW): PAG 1 NHTW reviews as starter activities</p>	<p>Scientific writing (HSW): PAG 2 NHTW reviews as starter activities</p>	<p>Writing to argue: Sustainability of processing waste polymers NHTW reviews as starter activities</p>	<p>Scientific writing (HSW): PAG 4 NHTW reviews as starter activities</p>	<p>Scientific writing (HSW): PAG 3 Scientific writing (HSW): PAG 5 NHTW reviews as starter activities</p>	<p>Scientific writing (HSW): PAG 10 Scientific writing (HSW): PAG 9 NHTW reviews as starter activities</p>

		Writing to describe: Benefits for sustainability of developing chemical processes with high atom economy				
Numeracy	Rearranging formula Calculating percentages	Rearranging formula	Calculating angles	Standard form	Drawing and interpreting graphs Gradients Rearranging equations	Drawing and interpreting graphs Gradients Rearranging equations
Homework	Completion of Doodle section quizzes	Completion of Doodle section quizzes	Completion of Doodle section quizzes	Completion of Doodle section quizzes	Completion of Doodle section quizzes	Completion of Doodle section quizzes
Assessment this half-term	Test on content delivered so far PAG 1	Test on content delivered so far PAG 2	Test on content delivered so far	Test on content delivered so far PAG 4	Test on content delivered so far PAG 3 PAG 5	Mock exams PAG 10 PAG 9
Career opportunities Employment Links	LIFE SKILLS: Understanding what chemical formula represents EMPLOYMENT: Crystallographer	LIFE SKILLS: Understanding efficiency EMPLOYMENT: Process engineer	LIFE SKILLS: Understanding different reaction types EMPLOYMENT: Product development chemist	LIFE SKILLS: Understanding enthalpy EMPLOYMENT: Chemical engineer	LIFE SKILLS: Understanding how to change the rate of a reaction EMPLOYMENT: Fertiliser manufacturing	LIFE SKILLS: Understanding how to detect and monitor air pollution EMPLOYMENT: Environment Agency
Enrichment						
Practical activities/HSW	PAG 1	PAG 2 Burning hydrocarbins		PAG 4	PAG 3 PAG 5	PAG 10 PAG 9
Employability Skills	Aiming high Creativity Leadership Listening Presenting Problem solving Staying positive Literacy Numeracy Independence Communication Teamwork	Aiming high Creativity Leadership Listening Presenting Problem solving Staying positive Literacy Numeracy Independence Communication Teamwork	Aiming high Creativity Leadership Listening Presenting Problem solving Staying positive Literacy Numeracy Independence Communication Teamwork	Aiming high Creativity Leadership Listening Presenting Problem solving Staying positive Literacy Numeracy Independence Teamwork	Aiming high Creativity Leadership Listening Presenting Problem solving Staying positive Literacy Numeracy Independence Communication Teamwork	Aiming high Creativity Leadership Listening Presenting Problem solving Staying positive Literacy Numeracy Independence Communication Teamwork
IT Skills	IT1 & IT2: Appropriate websites and research for homework as well as recall quizzes	IT1 & IT2: Appropriate websites and research for homework as well as recall quizzes	IT1 & IT2: Appropriate websites and research for homework as well as recall quizzes	IT1 & IT2: Appropriate websites and research for homework as well as recall quizzes	IT1 & IT2: Appropriate websites and research for homework as well as recall quizzes	IT1 & IT2: Appropriate websites and research for homework as well as recall quizzes
Notes/developments /standardisation comments						