	Half term 1	Half term 2	Half term 3	Half term 4	Half term 5	Half term 6
Year 13 Chemistry	**Content delivered:** **Unit 5.1:** Rate of reaction Rate order Rate equations Rate constant Rate graphs Deducing orders from rate graphs Multistep reactions Arrhenius equation Equilibrium The effects on equilibrium when temperature is changed Equilibrium constants **Unit 5.2:** Lattice enthalpy **Unit 6.1:** Kekulé model of benzene IUPAC rules for naming Electrophilic substitution of aromatic compounds Electrophilic substitution in arenes Electrophilic substitution in aromatic compounds Acidity of phenols Electrophilic substitution of phenol Directing effects of electron groups	**Content delivered:** **Unit 5.1:** Bronsted-Lowry Acid dissociation constant pH logs Calculating pH **Unit 5.2:** Enthalpy change of solution Ionic charge effect on exothermic values Using oxidising and reducing agents Redox equations and half equations Oxidation numbers **Unit 6.1:** Oxidation of aldehydes Nucleophilic addition Detecting carbonyls Detecting aldehydes Solubility of carboxylic acids Reactions of carboxylic acids Esterification Hydrolysis of esters Formation of acyl chlorides Using acyl chlorides	**Content delivered:** **Unit 5.1:** Buffer solutions Controlling blood pH Titration curves **Unit 5.2:** Redox titrations Standard electrode potentials Measuring cell potentials Cell potentials Electrode potentials Fuel cells **Unit 6.2:** Basicity of amines Aliphatic amines Aromatic amines Amino acids	**Content delivered:** **Unit 5.3:** Electron configuration of period 4 Transition elements Ligands Complex ions Coordination numbers Stereoisomerism **Unit 6.2:** Amides Optical isomerism Chiral centres Condensation polymerisation Acid-base hydrolysis **Unit 6.3:** Qualitative analysis of functional groups Carbon 13 NMR High resolution proton NMR	**Content delivered:** **Unit 5.3:** Ligand substitution reactions Ionic equations Redox reactions Qualitative analysis of ions **Unit 6.2:** C-C bond formation C–C≡N bond formation Reaction of nitriles Formation of substituted aromatic C-C Friedel-Crafts reaction Preparation and purification of organic solids Identification of organic groups Multi-stage synthetic routes for preparation **Unit 6.3:** Use of TMS Deducing structures from analytical data TLC Interpreting chromatograms	
Key Words **Level 2** **Level 3**	**5.1:** Rate of reaction, order, overall order, rate constant, half-life, rate-determining step, Arrhenius equation, tangent, gradient, instantaneous, equilibrium, homogeneous, heterogeneous, mole fraction, partial pressure, **5.2:** Enthalpy, lattice enthalpy, enthalpy of formation, enthalpy of combustion, **6.1:** Delocalised, aromatic, electron density, Electron donating, electron withdrawing	**5.1:**, Bronsted-Lowry, acid, base, buffer, conjugate, end point, equivalence point, ionic equation **5.2:** Enthalpy, lattice enthalpy, enthalpy of formation, enthalpy of combustion, enthalpy of solution, Born-Haber cycle, electron affinity, oxidising/reducing agent, oxidation, reduction, disproportionation, **6.1:** Bronsted-Lowry, acid, base, hydrolysis, esterification	**5.1:**, Bronsted-Lowry, acid, base, buffer, conjugate, end point, equivalence point, ionic equation **5.2:** Oxidising/reducing agent, oxidation, reduction, disproportionation, entropy, Gibbs free energy, standard hydrogen electrode, half-cell, electrode, oxidation, reduction, feasibility, potential difference **6.2:** Amine, proton acceptor, Condensation, polymerisation, monomer, esterification, repeating unit, hydrolysis	**5.3:** Transition metal, complex, ligand, mono-/bi-/multi-dentate, co-ordination number, dative covalent bond, planar, trigonal, trigonal pyramidal, trigonal bipyramidal, octahedral, substitution, precipitation, redox **6.2:** Condensation, polymerisation, monomer, esterification, repeating unit, hydrolysis, alkylation, acylation, nucleophile, addition, substitution, reduction, distillation, reflux, recrystallisation, melting point, **6.3:** Mobile phase, stationary phase, retention time, Rf value, TLC, Chemical shift, coupling, deuterated solvent, singlet, doublet, triplet, quartet, multiplet, n+1, TMS, spin-spin splitting	**5.3:** Transition metal, complex, ligand, mono-/bi-/multi-dentate, co-ordination number, dative covalent bond, planar, trigonal, trigonal pyramidal, trigonal bipyramidal, octahedral, substitution, precipitation, redox **6.2:** Condensation, polymerisation, monomer, esterification, repeating unit, hydrolysis, alkylation, acylation, nucleophile, addition, substitution, reduction, distillation, reflux, recrystallisation, melting point, **6.3:** Mobile phase, stationary phase, retention time, Rf value, TLC, Chemical shift, coupling, deuterated solvent, singlet, doublet, triplet, quartet, multiplet, n+1, TMS, spin-spin splitting	
Where previous knowledge has occurred and future development **KS2 → KS3 → KS4 → KS5**	KS2: Drawing graphs KS3: Chemical reactions KS4: Energy changes, rates, organic chemistry KS5: Unit 3.2	KS2: Drawing graphs KS3: Acids and alkalis KS4: Chemical changes, organic chemistry KS5: Unit 2.1	KS2: Changes of state, electricity KS3: Chemical reactions, physical and chemical changes KS4: The atom, energy changes, organic chemistry KS5: Unit 3.2	KS2: Electricity KS3: Electricity, separations KS4: Chemical analysis, chemical changes, the atom KS5: Unit 2.1	KS2: Changes of state KS3: Chemical reactions KS4: Bonding, chemical analysis, the atom KS5: Unit 4	
Common Misconceptions	5.1: Initial rate compared to continuous data 6.1: Curly arrow direction	5.1: Buffer calculations 5.2: Calculating LE 6.1: Acid/Base hydrolysis	5.2: Calculating E_0 by subtracting the wrong way 6.2: Trend in basicity	6.2: Position of carbon in nitriles 6.3: Miscalculating R_f 5.3: Mixing up the chemical tests	5.3: d block classification 6.3: Applying the n+1 rule the wrong way round	
Literacy	NHTW reviews as starter activities	Scientific writing (HSW): PAG 8 Electrochemical cells NHTW reviews as starter activities	Scientific writing (HSW): PAG 11 pH Measurement Scientific writing (HSW): PAG 6 Synthesis of an organic liquid NHTW reviews as starter activities	Scientific writing (HSW): PAG 12 Research skills Scientific writing (HSW): PAG 7 Qualitative analysis NHTW reviews as starter activities	Scientific writing (HSW): PAG 4 Qualitative analysis of ions NHTW reviews as starter activities	
Numeracy	Drawing and interpreting graphs Calculating gradients	Logs Drawing and interpreting graphs	Calculating means Negative numbers	Rearranging equations	Rearranging equations Calculating means	

	Rearranging equations					
Homework	Completion of Seneca section quizzes	Completion of Seneca section quizzes	Completion of Seneca section quizzes	Completion of Seneca section quizzes	Completion of Seneca section quizzes	
Assessment this half-term	Test on content delivered so far per A2 format	Mock exams – paper 1, 2 & 3 (AS content + A2 content so far) PAG 8 Electrochemical cells	Test on content delivered so far PAG 11 pH Measurement PAG 6 Synthesis of an organic liquid	Mock exams – paper 1, 2 & 3 (AS content + A2 content so far) PAG 12 Research skills PAG 7 Qualitative analysis	A2 Papers PAG 4 Qualitative analysis of ions	
Career opportunities Employment Links	LIFE SKILLS: Understanding how to determine the speed of a reaction EMPLOYMENT: Industrial chemist	LIFE SKILLS: Understanding the effects of pH on the blood EMPLOYMENT: Phlebotomist	LIFE SKILLS: Understanding how to identify different chemicals EMPLOYMENT: Forensic scientist	LIFE SKILLS: Understanding the energy output of different fuel cells EMPLOYMENT: Fuel cell engineer	LIFE SKILLS: Understanding how to identify different compounds EMPLOYMENT: NMR spectroscopist	
Enrichment			Chemistry olympiad			
Practical activities/HSW		PAG 11 pH Measurement PAG 8 Electrochemical cells	PAG 11 pH Measurement PAG 6 Synthesis of an organic liquid	PAG 12 Research skills PAG 7 Qualitative analysis	PAG 4 Qualitative analysis of ions	
Employability Skills	Aiming high Literacy Creativity Numeracy Leadership Independence Listening Communication Presenting Teamwork Problem solving Staying positive	Aiming high Literacy Creativity Numeracy Leadership Independence Listening Communication Presenting Teamwork Problem solving Staying positive	Aiming high Literacy Creativity Numeracy Leadership Independence Listening Communication Presenting Teamwork Problem solving Staying positive	Aiming high Literacy Creativity Numeracy Leadership Independence Listening Communication Presenting Teamwork Problem solving Staying positive	Aiming high Literacy Creativity Numeracy Leadership Independence Listening Communication Presenting Teamwork Problem solving Staying positive	
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	