

CHEMISTRY LEARNING PATHWAY

Big Ideas	Year 7	Year 8	Year 9 Autumn	Y9 Spring	Y9 Summer	Year 10 Autumn	Year 10 Spring	Year 10 Summer	Year 11 Autumn	Year 11 Spring	Year 11 Summer	Year 12 Autumn	Year 12 Spring	Year 12 Summer	Year 13 Autumn	Year 13 Spring	Year 13 Summer	
Atoms, Ions, the Periodic Table and Properties	C1.2 Elements and Compounds (Atoms elements and compounds)	C2.1 - The Periodic table (the Periodic Table)	Topic 1: Atomic Structure and the Periodic Table 1.1-1.20	Topic 1: Ions, Bonding and Properties 1.21-1.40			Topic 5: Transition Metals 5.1	Topic 6: Groups of the periodic table 6.1-6.16		Revision of All	Revision of All	2.1.1 Atomic structure & Isotopes, 2.2.1 Electron structure, 2.2.2 Bonding structure, 3.1 Periodic table	3.1.1 Periodicity 3.1.2 Group 2 3.1.3 Halogens					
Calculations Involving Masses	C1.2 Percent Composition, C1.3 Conservation of Mass	C.2.1 Empirical Formula			Topic 1: Calculations involving Masses 1.41-1.53		Topic 1: Calculations involving Masses 1.41-1.53 Topic 5: Atom Economy, % Yield, Titration 5.8-5.18	Revision Topic 1		Revision of All	Revision of All	2.1.1 Calculating relative mass 2.1.3 Amount of a substance (the mole, formulae, reacting masses, gas volumes, percentage yield & atom economy)	Revision of module 2		Kc, Ka, Kw, Arrhenius,	Enthalpy cycles, Entropy, Redox titrations		
States of Matter, Methods of Separating and Purifying Substances	C1.1 Particles, (Particulate Nature of Matter)	C1.2 Separations (Pure and Impure)	Topic 2 - States of Matter and Methods of Purifying substances 2.1-2.12		Revision Topic 2		Topic 3: Making Salts and Solubility	Revision Topic 2		Revision All	Revision All		4.2.1 Alcohols - distillation 4.2.2 Haloalkanes - separating funnel	PAG 6 recrystallisation		6.3.1 Chromatography		
Chemical Changes and Materials	C1.3 Reactions, C1.4 Acids (Chemical Reactions)	C2.3 Metals and Acids (Chemical Reactions, Energetics, Materials)				Topic 4 Extracting Metals and Equilibria 4.1-4.8, 4.13-4.17 Topic 5 Corrosion 5.1-5.7 5.19-5.27	Topic 3: Acids and Alkalis, Electrolysis 3.1-3.31	Revising Topic 4&5	Topic 7: Rate of Reaction 7.1-7.8, Enthalpy, 7.6-7.16 Topic 8: Combustion	Topic 9 - Identifying Ions and Photometry 9.1-9.9, Composites	Revision All	2.1.4 Acids, bases, alkalis & neutralisation, titration) 2.1.5 Redox 3.2 Physical Chem Enthalpy,	3.2 Enthalpy and Rates of Reaction Revision of module 2	PAG 6 Rates of Reaction Project,	5.1-4 Rates, Orders, Equilibrium, Acid Calcs, Buffers, Practical 7 Identifying an unknown carbonyl	5.2 - Energy - Born Haber, Eth Soln, Redox, Cell potential, Transition metals and ligands		
Our Earth and Atmosphere		C1.4 Earth and Atmosphere (Earth and Atmosphere)	Topic 2: Potable Water			Topic 4: Mining, Recycling, LCA 4.8-4.12		Revision topic 4		Topic 8 - Earth and Atmosphere 8.8-8.15, 8.18-8.26	Revision All	4.1.2 Combustion of alkanes	4.1.3 Polymers - disposal ; 4.2.2 Haloalkanes & the environment					
Organic Chemistry		C2.3 Polymers	C1.3 - Fuels	Topic 1: Polymers				Revision Topic 1	Topic 8 - Fuels, 8.1-8.7, 8.16-8.17 Topic 9 Alcohols, Carboxylic Acids, Polymers 9.10-9.39	Revision All	Revision All	4.1.1 Basic concepts of organic chemistry 4.1.2 Alkanes	4.1.3 Alkenes 4.2.1 Alcohols 4.2.2 Haloalkanes	4.2.4 Analytical techniques IR spectroscopy	6.1.1 Aromatic compounds, 6.1.2 Carbonyl compounds, 6.1.3 Carboxylic acids and esters, 6.2.1 Amines, 6.2.2 Amino acids, amides and chirality	6.2.3 Polyesters and polyamides, 6.2.4 Extending the carbon chain, 6.3.2 Spectroscopy		
PHYSICS		Energy - fuels, particle model, energy transfer, structure of the atom, charges of sub-atomic particles.			Atomic structure, Rutherford, electronic configuration, ions (ionising radiation)		Particle model, density, absolute zero			electrical currents								
BIOLOGY	Diffusion	Respiration and photosynthesis word equations and exothermic reactions	Rate of reaction	Diffusion Percentage change		Fossil record	Respiration and photosynthesis word equations and exothermic reactions Surface area:Volume		Carbon and Nitrogen cycles. Fertilizers									
Skills: Practical	Boiling, Freezing, Evaporating, Physical vs Chemical Change, combustion, endo/exo	Demo Group 1 reactions, Group 7 Reactions and Metals vs Nonmetals, Empirical Formula, Chromatography, Distillation, Filtration, Evaporation, Metal Displacement, Indicators, Neutralisation, Gas Tests	Chromatography, Distillation, Filtration, Evaporation			Metal Displacement, Titration	Indicators, Neutralisation, Making Salts, Electrolysis	Group 1 reactions with water, Group 7 displacement reactions.	Rates, Cracking, Testing for Alkenes, Calorimetry			PAG 1 Calculating empirical formula, PAG 2 Acid base reactions, PAG 1 Gas, PAG 8 Enthalpy of reaction collection, PAG 2 titration	PAG 5 oxidation of alcohols, PAG 5 dehydration of alcohols, PAG 7 rate of hydrolysis, PAG 5 making a haloalkane, Pag 4 Halogen Displacement, Pag 4 Halide ion testing, PAG 10 Rate Temp, Pag 4-5 Equilibrium	PAG 12 investigation of synthesis of aspirin, PAG 6 synthesis of aspirin,	PAG 6 - Investigating Rates Research PAG7 Identifying an unknown carbonyl, Practical 9 Chromatography	PAG 8 Electrochemistry, PAG 12 Redox Titration, PAG 3 Enthalpy of Solution, Prac 6 Ligand Substitution, PAG 9 Identifying Ions		
Skills: Maths	Percent Composition, Conservation of mass, RFM, Cooling Curves, Interpreting melting points, Graph Skills, Interpreting pH Scales, Calculating Differences, Recording Results	Interpreting data tables and bar charts, Empirical Formula, Percent Composition, RF, Calculating Differences	Cooling Curves, Interpreting melting points, Rf, % Composition, Deducing the structure of atoms, and ion, RAM, Protons, Neutrons and Electrons	Dot-cross diagrams	RFM, Moles, Reacting Masses, Concentration			Trends in data, positive and negative numbers	Graph interpretation, tangents, proportionality, bond enthalpy, Supply and Demand, Atom Economy, Percentage Yield, Bond Enthalpy, Calorimetry			2.1.3 Amount of a substance (the mole, formulae, reacting masses, gas volumes, percentage yield & atom economy) enthalpy,	graph analysis, initial rate, instantaneous rate, Kc, bond enthalpy Revision of module 2	Revision of module 2, rates graphs, half-life, tangents	Rates, Tangents, half-life, In, Ka, Kc, kw, pKa, pH	Enthalpy cycles, redox titrations		
Chemical Equations	Work Equation: Intro symbol equations	Word and Symbol Equations				Metal Displacement	Half equations and net ionic equations					2.1.2 Formulae & equations 2.1.5 Redox 4.1.2 Alkanes radical substitution	4.1.3 Alkenes electrophilic addition 4.2.1 Alcohols oxidation, dehydration 4.2.2 Nucleophilic substitution	Revision of equations	Buffers	redox equations, ligand substitution		