

Topic	Elements of Life	Developing Fuels	Elements from the Sea	Ozone	What's in a Medicine
Prior Knowledge	<ul style="list-style-type: none"> ● The periodic table, atomic structure and chemical bonding ● Chemical equations and formulae ● EMS ● Acids ● Precipitation 	<ul style="list-style-type: none"> ● Simple organic chemistry and homologous series ● Useful products from crude oil ● Combustion of alkanes ● Exo and endothermic reactions ● Bond enthalpies & catalysis 	<ul style="list-style-type: none"> ● Halogens ● oxidation and reduction ● electrolysis ● dynamic equilibria ● structure of the atom, covalent bonding and moles 	<ul style="list-style-type: none"> ● Rates of reaction ● Covalent bonding ● Quantitative chemistry ● Electronic structure ● Enthalpy changes and bond enthalpies ● Oxidation states ● Catalysis 	<ul style="list-style-type: none"> ● Hydrogen bonding ● Alcohols & alkenes ● Oxidation & Equilibria ● Acids ● The interaction of radiation with matter ● Bond polarity ● Mass spectrometry ● Atom economy
Knowledge	<ul style="list-style-type: none"> ● Atomic structure, mass spectrometry, nuclear fusion ● Wave & particle models ● Shells, subshells and orbitals, periodicity ● Covalent bonding and shapes of molecules ● RAM, RFM, % yield ● Bonding, structure, properties & precipitates ● Group 1 and group 2 ● Reacting masses, neutralisation and concentrations 	<ul style="list-style-type: none"> ● Thermochemistry ● Enthalpy cycles and Hess's Law ● Alkanes ● Bond enthalpies ● Catalysis & cracking ● Electrophilic addition, sigma & pi bonds ● Addition polymerisation ● Combustion & gas calculations ● Shapes of molecules, organic structures, E/Z isomerism ● Alternative fuels 	<ul style="list-style-type: none"> ● Chemistry of the halogens ● Oxidation states and redox ● Electrolysis ● Dynamic equilibrium and the equilibrium constant ● Redox, titrations, risk and benefits of chlorine ● Atom economy and hydrogen halides ● Le Chatelier's principle 	<ul style="list-style-type: none"> ● Gas calculations ● Interactions of radiation with matter ● Radical reactions ● Measuring rates of reaction ● Homogeneous catalysis ● Haloalkanes and intermolecular bonding ● Nucleophilic substitution 	<ul style="list-style-type: none"> ● Reactions of alcohols ● The OH group and derivatives of carboxylic acids ● Infrared spectroscopy ● Mass spectrometry for organic compounds ● Synthesis of salicylic acid and aspirin
Assessment Pattern	2 x interim tests (50 marks) 1 x End of topic test (50 marks)	1 x End of topic test (50 marks)	1 x End of topic test (50 marks)	1 x End of topic test (50 marks)	1 x End of topic test (50 marks)
End of year Exam (70 marks)					

Topic	The Chemical Industry	Polymers and Life	Developing Metals	Colour by Design	Oceans
Prior Knowledge	<ul style="list-style-type: none"> ● Bond enthalpies ● Redox reactions and oxidation states ● Equilibria and equilibrium constants ● Rates of reaction ● Calculations involving amount of substance ● Catalysis 	<ul style="list-style-type: none"> ● Addition polymers ● Organic functional groups ● Formation of esters ● Stereoisomerism ● Chromatography ● Intermolecular bonds ● Catalysis ● Mass spectrometry 	<ul style="list-style-type: none"> ● Electron energy levels ● Atomic absorption and emission spectra ● Redox reactions and oxidation states ● Chemical equilibria ● Catalysis 	<ul style="list-style-type: none"> ● Sigma and pi bonds ● VSPR and shapes of molecules ● Enthalpy changes ● Organic functional groups & nomenclature ● Organic mechanisms ● Intermolecular bonding ● Chromatography 	<ul style="list-style-type: none"> ● Ionic bonding ● Acids and bases ● Enthalpy changes ● Intermolecular bonds ● Chemical equilibria ● Equilibrium constants
Knowledge	<ul style="list-style-type: none"> ● Nitrogen chemistry and redox reactions ● Equilibrium constants and the effects of changes in conditions ● Measuring rates of reaction ● Orders of reactions and the use of the Arrhenius Equation ● Finding orders using a half-life method and the link between rate equations and mechanisms ● A case study of industrial process 	<ul style="list-style-type: none"> ● Organic compounds and condensation reactions ● Hydrolysis of esters and amides ● Optical isomerism and the formation of peptide bonds ● Protein structure and the bonds ● The catalytic behaviour of enzymes ● Interactions between drugs and receptor sites ● The function of DNA and RNA ● Mass spectrometry and NMR 	<ul style="list-style-type: none"> ● Transition metals and their oxidation states ● Transition metals as catalysts ● Colour in transition metal compounds and complexes ● Electrochemical cells ● Rusting and methods of protection ● Structure and properties of complexes 	<ul style="list-style-type: none"> ● Colour in organic molecules ● Delocalised model of benzene ● Electrophilic substitution ● Making dye molecules ● Dye fiber interactions ● Triglyceride molecules ● GC/LC ● Reactions of aldehydes and ketones ● Functional group interconversion ● Classifying organic reactions and devising synthetic routes 	<ul style="list-style-type: none"> ● Dissolving processes ● The greenhouse effect and acid-base chemistry buffer solutions ● Solubility products ● Entropy changes
Assessment Pattern	1 x End of topic test (50 marks)	1 x End of topic test (50 marks)	1 x End of topic test (50 marks)	1 x End of topic test (50 marks)	1 x End of topic test (50 marks)
End of year Exam (70 marks)					