

Topic	Elements of Life	Developing Fuels	Elements from the Sea	Ozone	What's in a Medicine
<b>Prior Knowledge</b>	<ul style="list-style-type: none"> <li>• The periodic table, atomic structure and chemical bonding</li> <li>• Chemical equations and formulae</li> <li>• EMS</li> <li>• Acids</li> <li>• Precipitation</li> </ul>	<ul style="list-style-type: none"> <li>• Simple organic chemistry and homologous series</li> <li>• Useful products from crude oil</li> <li>• Combustion of alkanes</li> <li>• Exo and endothermic reactions</li> <li>• Bond enthalpies &amp; catalysis</li> </ul>	<ul style="list-style-type: none"> <li>• Halogens</li> <li>• oxidation and reduction</li> <li>• electrolysis</li> <li>• dynamic equilibria</li> <li>• structure of the atom, covalent bonding and moles</li> </ul>	<ul style="list-style-type: none"> <li>• Rates of reaction</li> <li>• Covalent bonding</li> <li>• Quantitative chemistry</li> <li>• Electronic structure</li> <li>• Enthalpy changes and bond enthalpies</li> <li>• Oxidation states</li> <li>• Catalysis</li> </ul>	<ul style="list-style-type: none"> <li>• Hydrogen bonding</li> <li>• Alcohols &amp; alkenes</li> <li>• Oxidation &amp; Equilibria</li> <li>• Acids</li> <li>• The interaction of radiation with matter</li> <li>• Bond polarity</li> <li>• Mass spectrometry</li> <li>• Atom economy</li> </ul>
<b>Knowledge</b>	<ul style="list-style-type: none"> <li>• Atomic structure, mass spectrometry, nuclear fusion</li> <li>• Wave &amp; particle models</li> <li>• Shells, subshells and orbitals, periodicity</li> <li>• Covalent bonding and shapes of molecules</li> <li>• RAM, RFM, % yield</li> <li>• Bonding, structure, properties &amp; precipitates</li> <li>• Group 1 and group 2</li> <li>• Reacting masses, neutralisation and concentrations</li> </ul>	<ul style="list-style-type: none"> <li>• Thermochemistry</li> <li>• Enthalpy cycles and Hess's Law</li> <li>• Alkanes</li> <li>• Bond enthalpies</li> <li>• Catalysis &amp; cracking</li> <li>• Electrophilic addition, sigma &amp; pi bonds</li> <li>• Addition polymerisation</li> <li>• Combustion &amp; gas calculations</li> <li>• Shapes of molecules, organic structures, E/Z isomerism</li> <li>• Alternative fuels</li> </ul>	<ul style="list-style-type: none"> <li>• Chemistry of the halogens</li> <li>• Oxidation states and redox</li> <li>• Electrolysis</li> <li>• Dynamic equilibrium and the equilibrium constant</li> <li>• Redox, titrations, risk and benefits of chlorine</li> <li>• Atom economy and hydrogen halides</li> <li>• Le Chatelier's principle</li> </ul>	<ul style="list-style-type: none"> <li>• Gas calculations</li> <li>• Interactions of radiation with matter</li> <li>• Radical reactions</li> <li>• Measuring rates of reaction</li> <li>• Homogeneous catalysis</li> <li>• Haloalkanes and intermolecular bonding</li> <li>• Nucleophilic substitution</li> </ul>	<ul style="list-style-type: none"> <li>• Reactions of alcohols</li> <li>• The OH group and derivatives of carboxylic acids</li> <li>• Infrared spectroscopy</li> <li>• Mass spectrometry for organic compounds</li> <li>• Synthesis of salicylic acid and aspirin</li> </ul>
<b>Assessment Pattern</b>	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
<b>Prior Knowledge</b>	<ul style="list-style-type: none"> <li>● Bond enthalpies</li> <li>● Redox reactions and oxidation states</li> <li>● Equilibria and equilibrium constants</li> <li>● Rates of reaction</li> <li>● Calculations involving amount of substance</li> <li>● Catalysis</li> </ul>	<ul style="list-style-type: none"> <li>● Addition polymers</li> <li>● Organic functional groups</li> <li>● Formation of esters</li> <li>● Stereoisomerism</li> <li>● Chromatography</li> <li>● Intermolecular bonds</li> <li>● Catalysis</li> <li>● Mass spectrometry</li> </ul>	<ul style="list-style-type: none"> <li>● Electron energy levels</li> <li>● Atomic absorption and emission spectra</li> <li>● Redox reactions and oxidation states</li> <li>● Chemical equilibria</li> <li>● Catalysis</li> </ul>	<ul style="list-style-type: none"> <li>● Sigma and pi bonds</li> <li>● VSPR and shapes of molecules</li> <li>● Enthalpy changes</li> <li>● Organic functional groups &amp; nomenclature</li> <li>● Organic mechanisms</li> <li>● Intermolecular bonding</li> <li>● Chromatography</li> </ul>	<ul style="list-style-type: none"> <li>● Ionic bonding</li> <li>● Acids and bases</li> <li>● Enthalpy changes</li> <li>● Intermolecular bonds</li> <li>● Chemical equilibria</li> <li>● Equilibrium constants</li> </ul>
<b>Knowledge</b>	<ul style="list-style-type: none"> <li>● Nitrogen chemistry and redox reactions</li> <li>● Equilibrium constants and the effects of changes in conditions</li> <li>● Measuring rates of reaction</li> <li>● Orders of reactions and the use of the Arrhenius Equation</li> <li>● Finding orders using a half-life method and the link between rate equations and mechanisms</li> <li>● A case study of industrial process</li> </ul>	<ul style="list-style-type: none"> <li>● Organic compounds and condensation reactions</li> <li>● Hydrolysis of esters and amides</li> <li>● Optical isomerism and the formation of peptide bonds</li> <li>● Protein structure and the bonds</li> <li>● The catalytic behaviour of enzymes</li> <li>● Interactions between drugs and receptor sites</li> <li>● The function of DNA and RNA</li> <li>● Mass spectrometry and NMR</li> </ul>	<ul style="list-style-type: none"> <li>● Transition metals and their oxidation states</li> <li>● Transition metals as catalysts</li> <li>● Colour in transition metal compounds and complexes</li> <li>● Electrochemical cells</li> <li>● Rusting and methods of protection</li> <li>● Structure and properties of complexes</li> </ul>	<ul style="list-style-type: none"> <li>● Colour in organic molecules</li> <li>● Delocalised model of benzene</li> <li>● Electrophilic substitution</li> <li>● Making dye molecules</li> <li>● Dye fiber interactions</li> <li>● Triglyceride molecules</li> <li>● GC/LC</li> <li>● Reactions of aldehydes and ketones</li> <li>● Functional group interconversion</li> <li>● Classifying organic reactions and devising synthetic routes</li> </ul>	<ul style="list-style-type: none"> <li>● Dissolving processes</li> <li>● The greenhouse effect and acid-base chemistry buffer solutions</li> <li>● Solubility products</li> <li>● Entropy changes</li> </ul>
<b>Assessment Pattern</b>	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)				