

National 5 Unit 3 – Chemistry in Society	
<i>Key learning points</i>	<i>Notes</i>
<p>Metals</p> <p>I can explain how metallic bonding allows metals to conduct electricity</p> <p>*I can construct balanced ionic equations based on the reactions of metals with water, oxygen and acids</p> <p>I can state that oxidation / reduction is the loss / gain of electrons</p> <p>I can explain that oxidation and reduction reactions occur together and are termed redox reactions</p> <p>*I can identify ion-electron equations as either reduction or oxidation reactions</p> <p>I can construct an electro-chemical cell using different metals or using a non-metal electrode and explain why an electrolyte is essential</p> <p>*I can use the electrochemical series to predict the direction of current when different metals are connected in a cell</p> <p>*I can construct ion-electron equations based on electro-chemical cells</p> <p>I can describe different types of batteries and show by experiment that a lead-acid battery can be recharged</p> <p>I can research technological advances in the construction of batteries e.g. fuel cells, and find out how redox reactions are utilised in them</p> <p>I can explain why the extraction of a metal from its ore is termed a reduction</p>	

<p>reaction</p> <p>*I can identify the reducing agent in the extraction of metals from balanced ionic equations</p> <p>*I can show by calculation how to work out the percentage by mass of a metal in an ore</p>	
<p>Properties of plastics</p> <p>I can give examples of natural and synthetic polymers</p> <p>I can state that addition polymers are made from unsaturated monomers joining together by opening the double carbon-carbon bonds</p> <p>*I can represent an addition polymer and show how it is constructed from its constituent monomers</p> <p>*Given a section of an addition polymer I can identify the repeating unit and from that I can construct the monomer</p> <p>I can state that condensation polymers are made from monomers with two functional groups at either end of the molecule</p> <p>I can state that condensation polymers join together by the removal of a small molecule, usually water</p> <p>*I can identify the ester link within a polyester chain</p> <p>*Given the structure of a polymer chain I can identify if it is an addition or condensation polymer and identify its constituent monomers</p> <p>I can research and present information about novel polymers and investigate some of their properties</p>	

<p>Fertilisers</p> <p>I can show by experiment how to produce ammonia in the lab</p> <p>I can state that ammonia is a soluble gas that dissolves in water to produce an alkali</p> <p>I can explain why ammonia is difficult to produce by direct combination of nitrogen and hydrogen</p> <p>I can construct a balanced formula equation to show that the direct combination of nitrogen and hydrogen is a reversible reaction</p> <p>I can describe the industrial production of ammonia by the Haber Process</p> <p>I can state the conditions used in the Haber Process to maximise the yield of ammonia</p> <p>I can describe, using balanced formula equations, how ammonia can be used to make nitric acid</p> <p>I can describe, using balanced formula equations, how nitric acid can be used to make nitrate fertilisers</p> <p>I can state the importance of Nitrogen, Potassium and Phosphorus to plant growth</p> <p>*I can calculate and compare the percentage by mass of N, P and K in different fertilisers</p> <p>I can state that growing populations require more food and relate this to increased use of synthetic fertilisers</p>	

I can research the impact synthetic fertilisers can have on the environment	
Nuclear chemistry I can state that if the nucleus of an atom is unstable then it can emit radiation I can state the mass and charge of alpha, beta and gamma radiation and compare their ability to penetrate different materials *I can construct nuclear equations representing radioactive decay I can state that the time taken for the mass of a particular radioisotope to decay is fixed and is termed 'half-life' *I can explain how to use data about radioactive half-life/ carbon dating to calculate the age of an unknown sample I can research some uses of radioisotopes in industry and medicine	
Chemical analysis I can carry out a range of analytical techniques safely and accurately e.g. acid/ base titration, precipitation, flame testing I can collect accurate data from my analysis of certain compounds in the lab I can demonstrate how to accurately carry out a titration and work out an unknown quantity by calculation I can construct accurate notes, diagrams and tables of data from my experiments I can research information about different methods used to monitor our environment	

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** These skills can be practised in the 'Focus on National 5 Unit 3' booklet.*