

Year 8 Chemistry – Programme of study

The topics we shall cover this year will be as follows:

8/1 The influence of humankind on the environment

- Man's constant demand for materials – the majority of which are natural resources and are rapidly running out
- Sources of pollution of air, land and water
- Examples of pollutants and their effects on the environment
- Ways of reducing pollution

8/2 The elements

- Definition of an element
- Classification of elements in the Periodic Table according to their properties
 - Metals and non-metals
- Trends within the Periodic Table (vertical groups, horizontal periods)
- Definitions of compounds and mixtures including diagrams of particles in elements, compounds and mixtures
- Types of materials – their properties and uses

8/3 Competition amongst the elements

- Establishing a Reactivity Series for the elements by consideration of a variety of chemical reactions, including:
 - The Thermit reaction (iron oxide+aluminium) (oxidation/reduction)
 - Burning magnesium in carbon dioxide
 - Heating metal oxides with carbon
 - Displacement reactions of metals with various salt solutions
 - Understand the principle of displacement
- The Blast Furnace as an industrial process
- Stability of metal compounds (carbonates, nitrates)
- Placing hydrogen in the Reactivity Series by considering reactions of metals with water and dilute acids
- Chemical reaction terms: exothermic, endothermic

8/4 Oxygen

- The importance of oxygen and uses/properties/test for oxygen
- Lab. Prep. of oxygen - hydrogen peroxide with manganese dioxide catalyst
- Industrial manufacture of oxygen (fractional distillation of liquid air)
- Reaction of elements with oxygen to form oxides (oxidation)
- Classification of oxides (acidic, basic, neutral, amphoteric)
- Composition of air (approx. 78% nitrogen, 21% oxygen, 1% argon)
 - Experiment to determine % oxygen in air (copper and gas syringes)
- The fire triangle – fuel, oxygen, heat
- Combustion products of fuels such as methane/wax
- Reaction of acids with bases/alkalis
 - pH scale, neutralisation products and energy changes
- The conditions necessary for rusting and how to prevent it

8/5 The effects of electricity on materials

- Types of materials (conductors, insulators, electrolytes)
- Metallic conductivity involves mobile electrons and no chemical reaction
- Electrolytic conductivity involves mobile ions and does involve chemical reactions at the electrodes
- The terms cathode (-ve) and anode (+ve)
- Metals and hydrogen form +ve ions and are formed at the cathode
- Non-metals (except hydrogen) form –ve ions and are formed at the anode
- Electrode products of a variety of aqueous solutions of ionic substances
 - Tests for common gaseous products including oxygen, hydrogen, chlorine
- Electrolysis of water
- Uses of electrolysis
 - Production of aluminium
 - Production of chlorine, hydrogen, sodium hydroxide (from brine)
 - Electroplating
 - Purification of copper

8/6 Chemicals from the rocks and the sea

- Industrial processes for obtaining chemicals from raw materials
- Sources of raw materials – air, rocks, water, living things, fossil fuels
- Chemical analysis
 - Investigation of malachite
 - Anion and cation testing
 - Investigation of unknowns

8/7 The rock record

- Types of rock – sedimentary, metamorphic, igneous
- Rock formation
- The rock cycle