Syllabus content for the unit: TRANSPORTING CHEMICALS

Students appreciate the need to work safely with chemicals by learning about importance of the chemical industry and the way it deals with hazards. In consolidating the use of symbols and equations they learn to recognise different chemical reactions such as oxidation or neutralisation. Finally they learn about the organisation of elements in the periodic table based on their chemical properties.

Jewellery

Hazards and the chemical industry

know common hazard symbols - corrosive, flammable, toxic, irritant/harmful
understand how the Hazchem code communicates information about the safety of chemicals
be able to use the Hazchem code to interpret a Hazchem sign
understand that methods of dealing with spillages are related to the properties of the chemical (acidity, flammability, reaction with water, toxicity)

know how different factors affect the choice of location of a particular chemical industry
know the method of manufacture of ammonia
know the production and properties of sulphuric acid as a typical acid….
know the chemical changes involved in the manufacture of ammonia by the Haber process, or sulphuric acid by the contact process.
know what is meant by the terms raw material, product and by-product in chemical manufacture

- be able to interpret simple flow diagrams for chemical manufacturing processes
- know that transport of chemicals has social, economic and environmental implications

know how acids and alkalis are detected using indicators
know that chemical reactions are often accompanied by a release of energy
understand that some chemical reactions can be monitored by the change in temperature which occurs

Symbols, formulas and balanced equations

know that new substances are formed when atoms combine
know that all materials are made up of one or more of the elements
know that a compound is a pure substance that contains more than one type of atom
know that compounds have a fixed composition and can be represented by formulae
be able to interpret chemical formulae in terms of the elements and the number of atoms present
know that mass is conserved in chemical reactions

be able to interpret construct and balance symbol equations
be able to use given information about chemical reactions to recognise patterns of behaviour ***eg oxidation, reduction, combustion, neutralisation***

The Periodic Table

know that in the Periodic Table:
- the elements are arranged in order of atomic number
- the horizontal rows are called 'periods'
- elements with similar properties are in vertical columns called ‘groups'
- some groups have names - alkali metals, halogens, noble gases

be able to predict the formula of a compound of an element given the formula of compounds of elements in the same group

The noble gases

know that noble gases are inert

be able to relate the uses of noble gases to their properties (limited to helium for airships and balloons, neon for advertising signs, argon for light bulbs and provision of local inert atmosphere, krypton and xenon for specialised bulbs and radon for treating cancer)

The alkali metals

know that Group I of the Periodic Table forms a family of elements called alkali metals, with similar chemical properties

know that the reactivity of the alkali metals increases down the group

know that alkali metals are very reactive and need to be protected from attack by air or water

know that alkali metals vary in their reactivity with water but all form an alkaline solution and hydrogen

The halogens

know that Group VII of the Periodic Table forms a family of elements called halogens, with similar chemical properties

The transition metals

know that transition metals are used in coinage and jewellery and can often act as catalysts