S1 Chemistry Unit 2 - Chemical Reactions

Signs of a chemical reaction

- A physical change is a change of state and a chemical reaction always forms a new substance.
- Chemical reactions can be identified by: a new substance being formed, a change in energy (temperature, light or sound), or the formation of a precipitate.

Reaction Rates

- Reaction rate means how quickly a chemical reaction progresses.
- Reaction rate can be changed by changing the temperature, concentration, particle size or by adding a catalyst.
- Reactions can be monitored by measuring the change in mass or volume of one of the reactants or the products
- Word equations can be written to show what happens in a chemical reaction.

Acids, alkalis and neutralisation

- Acids are substances with a pH of less than 7.
- Alkalis are solutions with a pH of more than 7.
- A solution that has a pH of 7 is said to be neutral.
- pH can be tested with pH paper or with universal indicator.
- Acids will display colours red, orange or yellow, neutral solutions will be green and alkaline solutions will be blue or purple.
- We dilute a solution by adding water, which will lower the concentration of a solution. This will raise the pH of an acid, or drop the pH of an alkali.
- Neutralisation is adding an acid and an alkali together to make a neutral solution.
- Neutralisation is used every day in real life, such as on farms to change the pH of soil, at home in baking, cleaning, treating indigestion, treating some insect stings, and in industry to remove (scrub) harmful gases or clean spills.

Rocks and soil

- There are 3 main types of rock: igneous, metamorphic and sedimentary.
- These are all linked by the rock cycle.
- Igneous rocks are formed when lava or magma cools and solidifies. Sedimentary rocks are softer rocks formed by the compression of mud, shells or sand, and metamorphic rocks are formed when pressure and heat are applied to other rocks over a long period of time.
- Rocks are made of grains. Igneous rocks do not have gaps between the grains. Sedimentary rocks do have gaps. Metamorphic rocks can usually be identified by the presence of distinct layers.
- Soil is a mixture of tiny rocks, dead plants and animals, air and water.
- The 4 main types of soil are sandy, clay, chalky and peat.
- Different soils have different water retentive properties.
- Acid rain is formed when non-metal oxides (such as carbon dioxide or sulfur dioxide) dissolve it water. This causes acid rain and can be damaging to plants, wildlife and the environment.

Extraction of metals

- An ore is a rock that contains metal.
- Metals can be extracted from their ores using different techniques. The method used depends on the metal's place in the reactivity series.
- Some very unreactive metals at the bottom of the reactivity series, such as silver and gold, are found in their pure form in the earth's surface. If they are found in ores, they can be extracted simply by heating.
- Metals between copper and zinc are extracted by heating them in the presence of carbon.
- Very reactive metals (aluminium and above) need to be extracted using electrolysis.