

Year 7 Chemistry

Unit 1: Particle Model

In this unit students will begin to understand that all matter is made of particles and develop the ability to use the particle model to explain how materials can change state from solids to liquids and gases.

Keywords for this Unit

Particle: A very tiny object such as an atom or molecule, too small to be seen with a microscope.

Particle model: A way to think about how substances behave in terms of small, moving particles. Diffusion: The process by which particles in liquids or gases spread out through random movement from a region where there are many particles to one where there are fewer.

Gas pressure: Caused by collisions of particles with the walls of a container.

Density: How much matter there is in a particular volume, or how close the particles are.

Evaporate: Change from liquid to gas at the surface of a liquid, at any temperature.

Boil: Change from liquid to a gas of all the liquid when the temperature reaches boiling point.

Condense: Change of state from gas to liquid when the temperature drops to the boiling point.

Melt: Change from solid to liquid when the temperature rises to the melting point.

Freeze: Change from liquid to a solid when the temperature drops to the melting point.

Sublime: Change from a solid directly into a gas.

Unit 2: Acids and Alkalis

In this unit, students will learn the features of acids and alkalis, the role of indicators and investigate the neutralisation reaction and its uses.

Keywords for this Unit

pH: Scale of acidity and alkalinity from 0 to 14.

Indicators: Substances used to identify whether unknown solutions are acidic or alkaline.

Base: A substance that neutralises an acid – those that dissolve in water are called alkalis.

Concentration: A measure of the number of particles in a given volume.

Unit 3: Separating Mixtures

In this unit, students will be able to describe the defining features of elements, compounds and mixtures and explore different methods of separating mixtures.

Keywords for this Unit:

Solvent: A substance, normally a liquid, that dissolves another substance.

Solute: A substance that can dissolve in a liquid.

Dissolve: When a solute mixes completely with a solvent.

Solution: Mixture formed when a solvent dissolves a solute. Soluble (insoluble): Property of a substance that will (will not) dissolve in a liquid.

Solubility: Maximum mass of solute that dissolves in a certain volume of solvent.

Pure substance: Single type of material with nothing mixed in.

Mixture: Two or more pure substances mixed together, whose properties are different to the individual substances.

Filtration: Separating substances using a filter to produce a filtrate (solution) and residue. Distillation: Separating substances by boiling and condensing liquids.

Evaporation: A way to separate a solid dissolved in a liquid by the liquid turning into a gas.

Chromatography: Used to separate different coloured substances.

Unit 4: Metals and Non-Metals	Unit 5: Using Resources	Unit 6: Climate
<p>In this unit, students will be investigating the reactions of metals and non-metals with oxygen, the reaction of metals with acids and using investigations into reactivity to construct a reactivity series which can be used to make predictions about the behavior of unknown elements in chemical reactions.</p> <p><u>Keywords For this Unit</u> Metals: Shiny, good conductors of electricity and heat, malleable and ductile, and usually solid at room temperature. Non-metals: Dull, poor conductors of electricity and heat, brittle and usually solid or gaseous at room temperature. Displacement: Reaction where a more reactive metal takes the place of a less reactive metal in a compound. Oxidation: Reaction in which a substance combines with oxygen. Reactivity: The tendency of a substance to undergo a chemical reaction.</p>	<p>In this unit students will learn about the Earth's role as an important provider of raw materials. Students will study how the extraction of different metals from ores varies depending on the reactivity of the metal and gain an understanding of the importance of recycling materials to live sustainably.</p> <p><u>Keywords For this Unit</u> Natural resources: Materials from the Earth which act as raw materials for making a variety of products. Mineral: Naturally occurring metal or metal compound. Ore: Naturally occurring rock containing sufficient minerals for extraction. Extraction: Separation of a metal from a metal compound. Recycling: Processing a material so that it can be used again. Electrolysis: Using electricity to split up a compound into its elements.</p>	<p>In this unit students will learn about the composition of the Earth's atmosphere and how the balance of the gases is kept constant due to natural cycling of elements and compounds. Students will also study the effect of human activity on climate change and look at the possible consequences of global warming.</p> <p><u>Keywords For this Unit</u> Global warming: The gradual increase in surface temperature of the Earth. Fossil fuels: Remains of dead organisms that are burned as fuels, releasing carbon dioxide. Carbon sink: Areas of vegetation, the ocean or the soil, which absorb and store carbon. Greenhouse effect: When energy from the sun is transferred to the thermal energy store of gases in Earth's atmosphere.</p>

Year 8 Chemistry

Unit 1: Types of Reaction

In this unit students will learn about different types of chemical reaction and represent them with both word and symbol equations.

Keywords For this Unit

Fuel: Stores energy in a chemical store which it can release as heat.

Chemical reaction: A change in which a new substance is formed.

Physical change: One that changes the physical properties of a substance, but no new substance is formed.

Reactants: Substances that react together, shown before the arrow in an equation.

Products: Substances formed in a chemical reaction, shown after the reaction arrow in an equation.

Conserved: When the quantity of something does not change after a process takes place.

Unit 2: Chemical Energy

In this unit students will learn why it is that some chemical reactions get hotter, and some get colder and be able to link their observations to the energy transfers happening during chemical bond breaking and making in a reaction.

Keywords For this Unit

Catalysts: Substances that speed up chemical reactions but are unchanged at the end.

Exothermic reaction: One in which energy is given out, usually as heat or light.

Endothermic reaction: One in which energy is taken in, usually as heat.

Chemical bond: Force that holds atoms together in molecules.

Year 9 Chemistry (Combined and Separate Science)

Unit 1: Chemistry of the Atmosphere

The Earth's atmosphere is dynamic and forever changing. The causes of these changes are sometimes man-made and sometimes part of many natural cycles. Scientists use very complex software to predict weather and climate change as there are many variables that can influence this. The problems caused by increased levels of air pollutants require scientists and engineers to develop solutions that help to reduce the impact of human activity.

Keywords For this Unit

Particulates: Small particles of carbon atoms.

Combustion: Burning (oxidation reaction)

Hydrocarbon: compound made of only carbon and hydrogen atoms.

Oxidation: When oxygen bonds to another element in a reaction.

Emissions: Chemicals released from a chemical reaction such as combustion.

Wavelength: The distance between the same 2 points on neighbouring waves.

Absorption: To take in.

Insulating: To prevent the flow of heat energy.

Atmosphere: The layer of gases surrounding the planet.

Composition: What something is made up of.

Photosynthesis: The reaction in green plants which converts water and carbon dioxide into glucose and oxygen.

Unit 2: Using Resources

Industries use the Earth's natural resources to manufacture useful products. In order to operate sustainably, chemists seek to minimise the use of limited resources, use of energy, waste and environmental impact in the manufacture of these products. Chemists also aim to develop ways of disposing of products at the end of their useful life in ways that ensure that materials and stored energy are utilised. Pollution, disposal of waste products and changing land use has a significant effect on the environment, and environmental chemists study how human activity has affected the Earth's natural cycles, and how damaging effects can be minimised.

Keywords For this Unit

Renewable: Easily replaced

Finite: A resource which will run out one day

Synthetic: Man made

Natural: Sourced from nature

Distillation: Separation process for a mixture of liquids involving evaporation and condensation

Evaporation: The change of state from a liquid to gas

Potable: Describes water that is safe to drink

Purity: A measure of the amount/ number of different substances mixed together

Corrosion: To rot away when referring to a metal, often through reaction with oxygen

Sacrificial protection: A coating of a less reactive metal on a more reactive one to prevent corrosion of the reactive metal

Alloy: A mixture of metals

Density: A measure of mass divided by volume

Polymer: A long chain molecule

Ceramic: Material made from clay

Composite: A mixture of materials bound together

Monomer: Single molecules which can join to form polymers

Equilibrium: The rate of the forwards reaction is the same as the rate of the reverse reaction

Reversible: A reaction which can go in either direction

Numeracy

Translate information between graphical and numeric form

Recognise and use expressions in decimal form.

Use ratios, fractions and percentages.

Make estimates of the results of simple calculations.

Use an appropriate number of significant figures.

Translate information between graphical and numeric form.