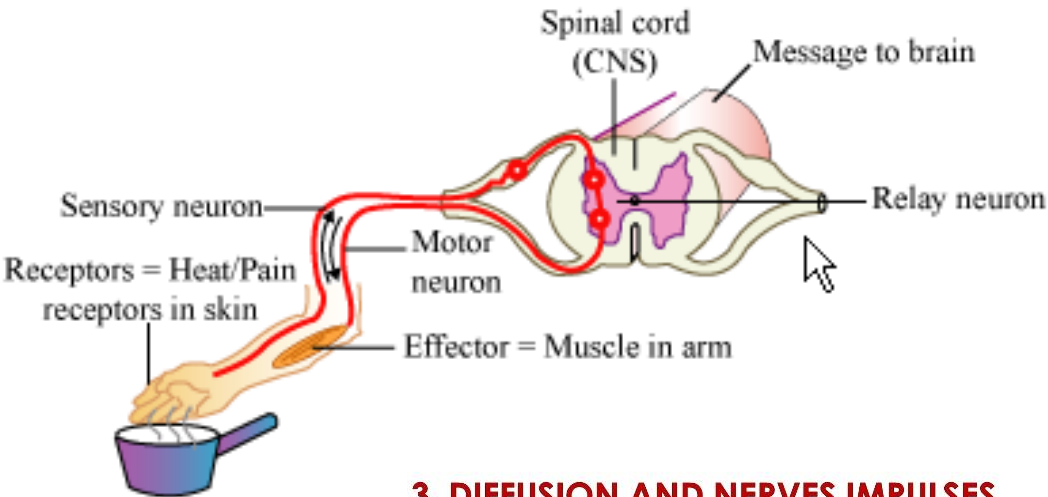
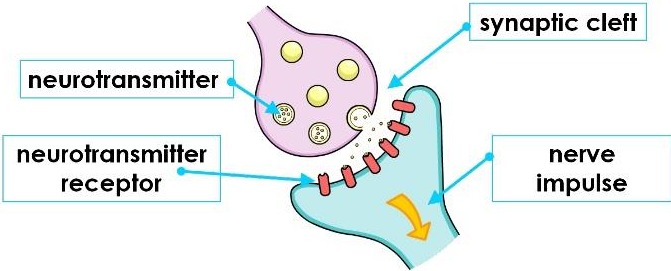


Homeostasis	The maintenance of a constant internal environment
Central nervous system (CNS)	The brain and spinal cord. Sometimes referred to as the coordinator
Neurones	Nerve cells – they link receptors and effectors to the CNS. Sensory neurones carry impulses from receptors to the CNS, relay neurones carry an impulse within the CNS and motor neurones carry the impulse from the CNS to an effector
Receptor	A cell or group of cells that detect a change and generate a nervous impulse
Effector	A muscle or gland that brings about a response
Synapse	A gap between neurones
Neurotransmitters	Chemicals which diffuse across the synapse and initiate a nervous impulse in the next neurone
Reflex response	An automatic response that you do not think about
Reflex Arc	The pathway of neurones in a reflex arc

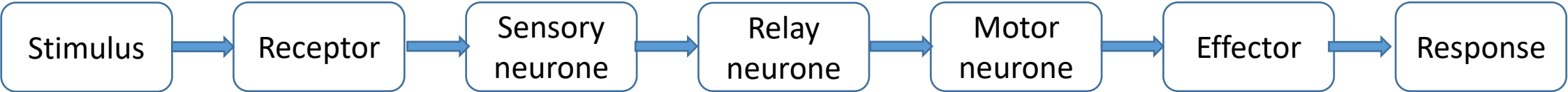


3. DIFFUSION AND NERVES IMPULSES

A **synapse** is a junction between two neurones across which electrical signals must pass.



Neurotransmitter molecules diffuse from vesicles towards the neurotransmitter receptors, moving from an area of high concentration to low concentration.

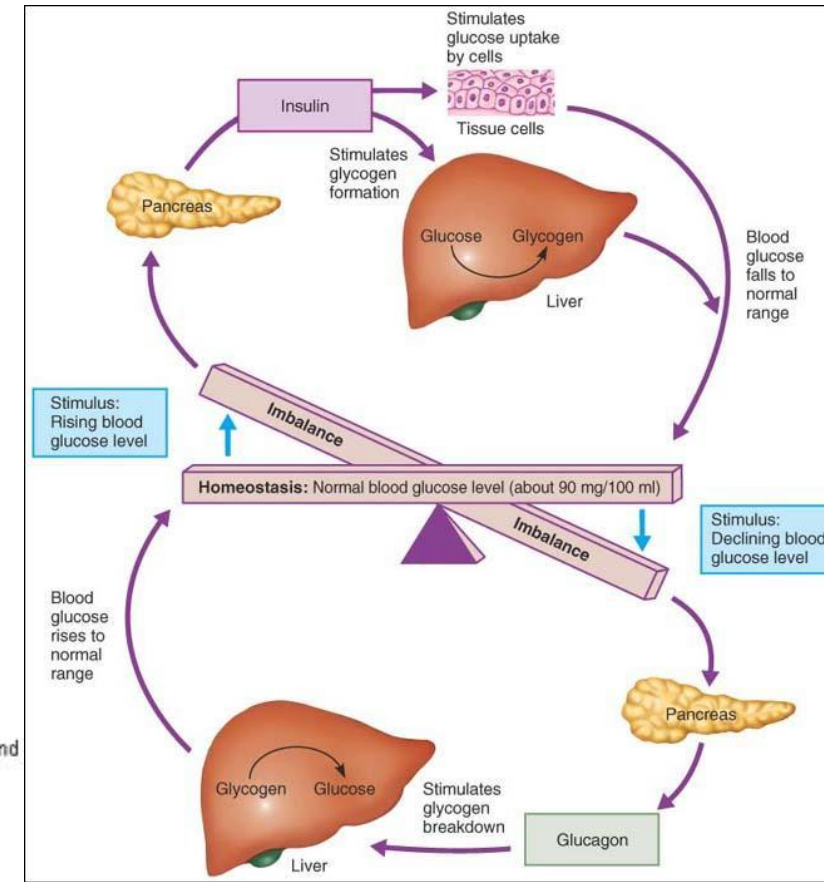
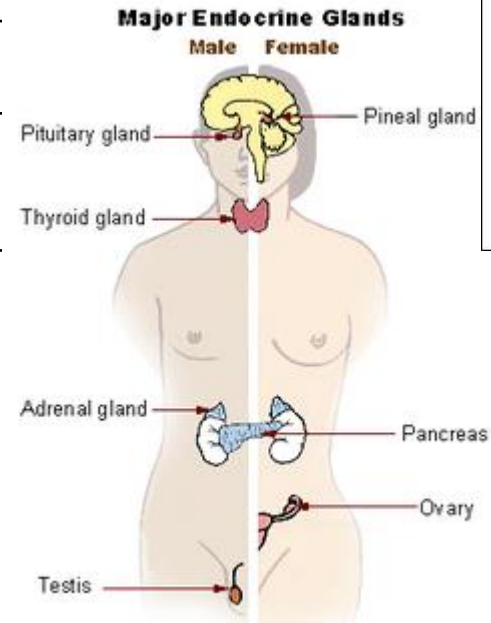


Key Terms

Knowledge Organiser – Hormonal control in humans

Diagrams

Gland	A structure in the body that produces hormones
Pituitary Gland	The master gland in your brain that produces a number of hormones, including TSH, FSH and LH
Insulin	A hormone produced in your pancreas that lowers blood glucose by converting it into glycogen and storing it in the liver
Glycogen	An insoluble molecule made from many glucose molecules
Glucagon	A hormone produced in the pancreas that raises blood glucose by breaking down glycogen stored in the liver
Negative feedback	A homeostatic mechanism by which the body detects a change and makes an adjustment to return itself to normal
Type I Diabetes	A medical condition that usually develops in younger people, preventing the production of insulin
Type II Diabetes	A medical condition that usually develops in later life, preventing the person producing enough insulin or preventing cells from responding to insulin

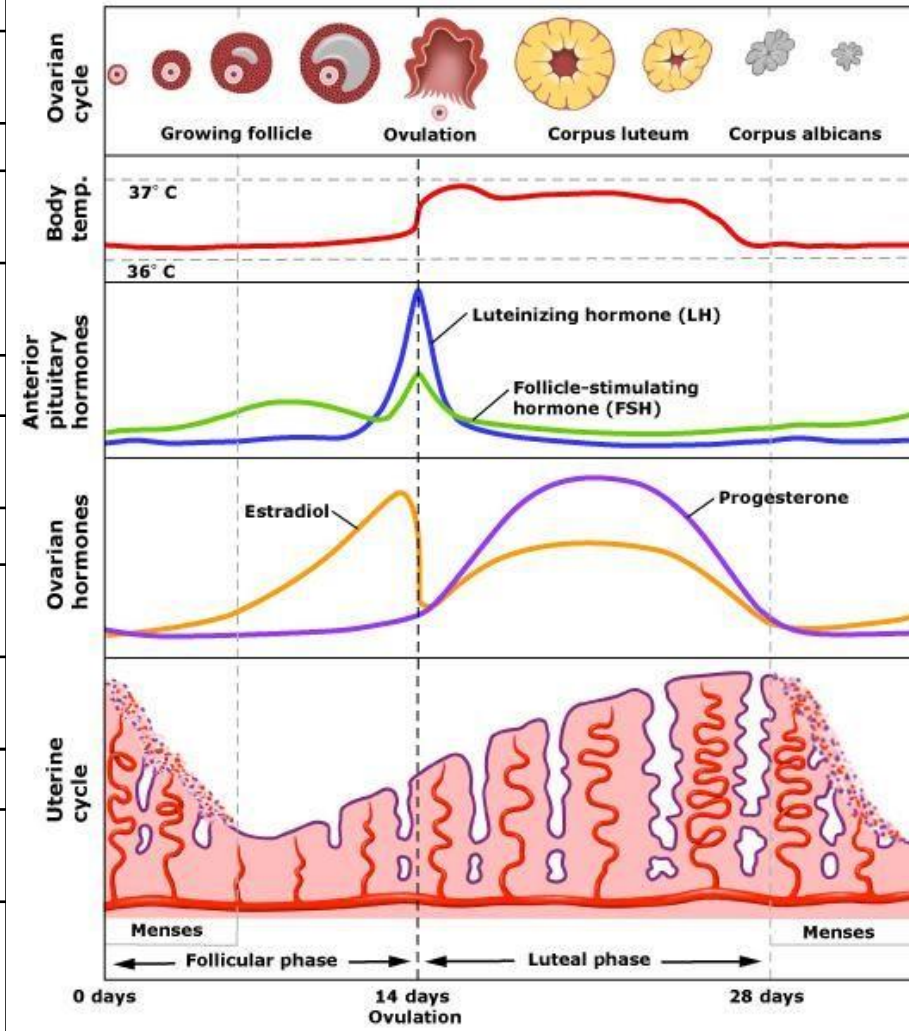


Key Terms

Knowledge Organiser – Hormones in Human Reproduction

Diagrams

Oestrogen	A female sex hormone produced in the ovaries that controls puberty and prepares the uterus for pregnancy.
Progesterone	A female sex hormone produced in the ovaries that prepares the uterus for pregnancy.
Testosterone	A male sex hormone produced in the testes that controls puberty.
Menopause	The point in a woman's life , usually between 45 and 55, when she stops menstruating and therefore cannot become pregnant.
Follicle stimulating hormone (FSH)	A hormone produced by the pituitary gland that causes an ovum to mature in an ovary and the production of oestrogen.
Follicle	A structure in an ovary in which an ovum (egg) matures.
Lutenising hormone (LH)	A hormone produced by the pituitary gland that stimulates ovulation.
Corpus luteum	After ovulation the empty follicle turns into this and releases progesterone.
Vasectomy	A contraceptive medical procedure during which a man's sperm ducts are blocked or cut.
Tubal ligation	A contraceptive medical procedure during which a woman's fallopian tubes are blocked or cut.
Gestation	The time between fertilisation and birth
Thyroid stimulating hormone (TSH)	A hormone produced by your pituitary gland that regulates your thyroid gland.
Thyroid gland	A gland in your neck that produces thyroxine to regulate how quickly your body uses energy and makes proteins, and how sensitive it is to other hormones.
Adrenaline	A hormone produced by your adrenal glands that causes an increase in heart rate ready for a 'fight or flight' response.
Adrenal glands	Glands that produce adrenaline



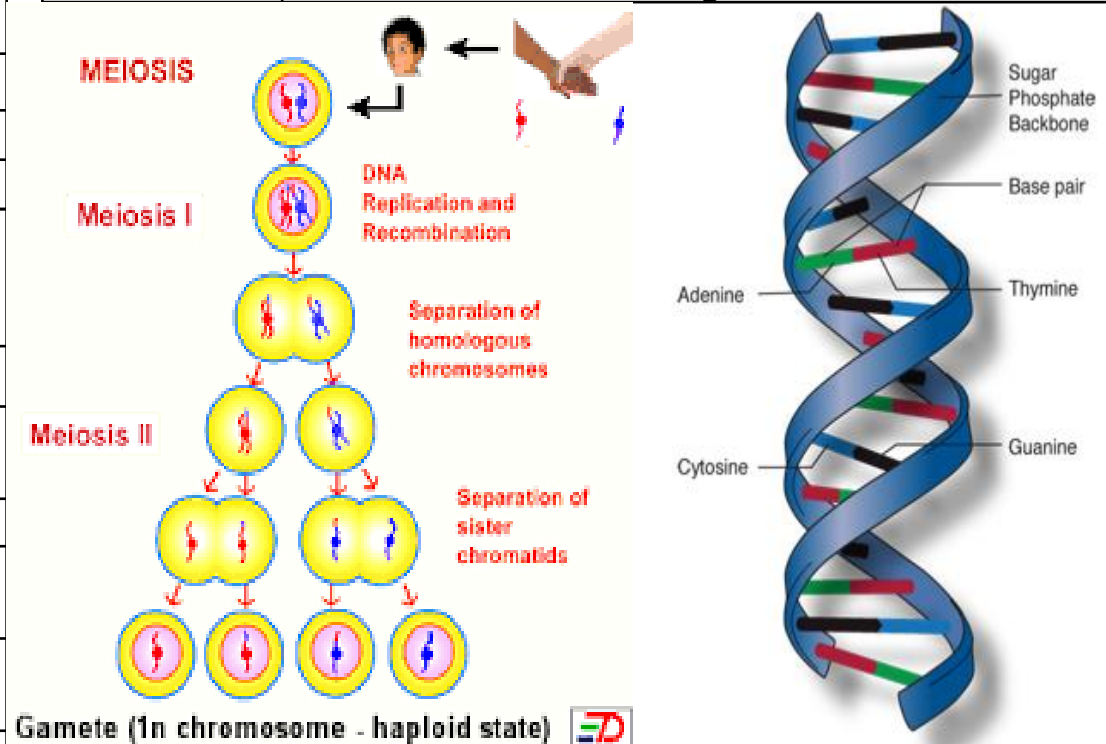
Key Terms

Knowledge Organiser – Variation

Diagrams

Asexual reproduction	Reproduction involving one parent, giving genetically identical offspring
Binary fission	The asexual reproduction of bacteria
Selective breeding	A process by which humans have chosen organisms to breed together to develop desirable characteristics
Artificial selection	Another name for selective breeding
Self-pollination	When pollen from one plant fertilises ova from the same plant
Cross-pollination	When pollen from one plant fertilizes ova from a different plant
Meiosis	Cell replication that produces four non-identical haploid cells from one diploid cell
Menstruating	Having a period as part of the menstrual cycle
Genome	One copy of all DNA found in your diploid body cells
DNA fingerprinting	The analysis of differences in DNA to identify individuals
Evolution	The theory first proposed by Charles Darwin that the different species found today formed as a result of the accumulation of small advantages that were passed on through generations
Double helix	The characteristic spiral structure of DNA
Nucleotide	A DNA base together with a sugar and a phosphate molecule that make up the backbone of the double helix
Transcription	The process of making an RNA copy of a gene sequence of DNA
Translation	The process of making a protein from an RNA copy of a gene sequence of DNA
Mutation	A permanent change to the DNA, which may be advantages, disadvantageous or have no effect
Ionising radiation	UV rays, x-rays and gamma rays that can cause mutations to DNA

Alleles	Two versions of the same gene, one from each parent
Genotype	The genetic make-up of an organism represented by letters
Phenotype	The physical characteristics of an organism
Punnett Square	A grid that used for determining the chance of inheritance
Cystic Fibrosis (CF)	A genetic disorder in which sufferers inherit recessive alleles from both parents and have excess mucus in their lungs



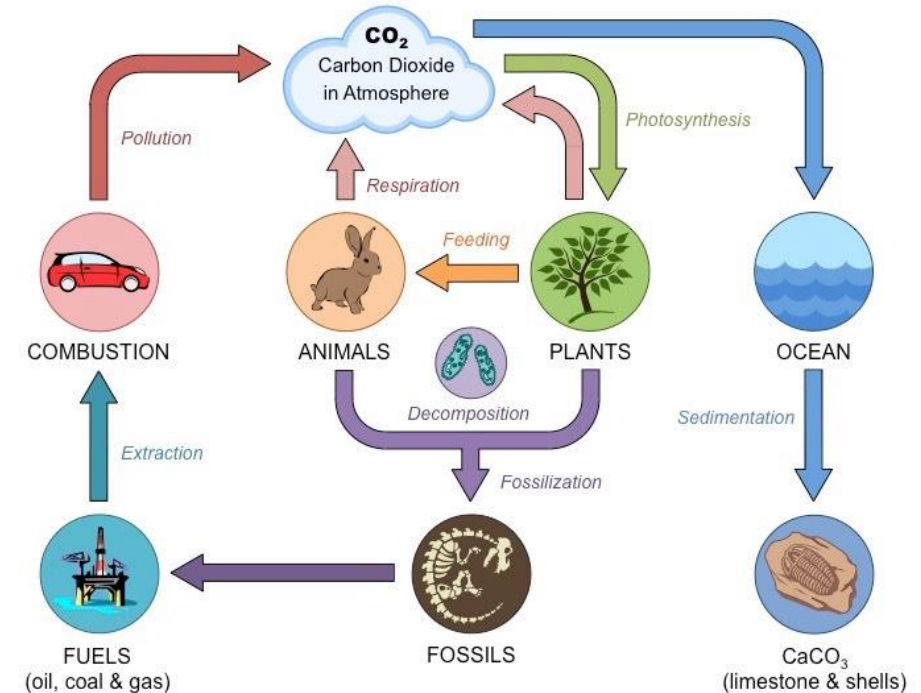
Key Terms

Knowledge Organiser – Ecology (sections 25, 26 and 27)

Diagrams

Population	The total number of organisms of the same species in an area.
Community	Populations of different species living in the same area.
Competition	The contest between organisms for resources.
Interdependence	All the organisms in a community depend upon each other.
Abiotic	The non-living parts of the environment.
Biotic	The living parts of the environment.
Invasive species	An organism that is not native and causes negative effects.
Ecosystem	The interaction of a community of living organisms and the non-living parts of the environment.
Structural adaptation	An advantage to an organism as a result of the way it is formed eg streamlining.
Behavioural adaptation	An advantage to an organism as a result of its behavior.
Functional adaptation	An advantage to an organism as a result of a process eg venom.
Extreme environment	A location in which it is challenging for most organisms to live.
Extremophile	An organism that lives in an extreme environment.
Sampling	Recording a small amount of information to make wider conclusions.
Quadrat	A square frame used in sampling.
Transect	A line along which systematic sampling occurs.
Producer	An organism that photosynthesises eg plant.
Biomass	A resource made from living organisms.
Consumer	An organism which eats other organisms. Primary consumers eat plants, secondary consumers eat herbivores, tertiary consumers eat carnivores.

Biodiversity	A measure of the different species present in a community.
Incomplete combustion	Burning of a fuel without enough oxygen leading to carbon monoxide production.
Recycle	Changing a waste product into new raw materials to make another product.
Sustainable	An activity that can continue without damaging the environment.
Deforestation	Cutting trees down to use the land for something else.
Conservation	Protecting an ecosystem or species from reduced numbers and often extinction.



Key Terms

Knowledge Organiser – The Rate and Extent of Chemical Change

Diagrams

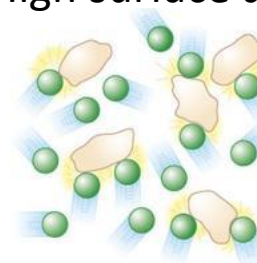
Rate of reaction	The speed at which a reaction takes place. This can be worked out in two ways: Mean rate of reaction = quantity of reactant used ÷ time Mean rate of reaction = quantity of product formed ÷ time
Activation energy	The minimum energy particles must have to react
Catalyst	A substance that speeds up a chemical reaction by lowering the activation energy
Enzymes	Molecules that act as catalysts in biological systems
Closed system	A system where no substances can get in or out
Dynamic equilibrium	System where both the forward and reverse reactions are taking place simultaneously and at the same rate

Factors affecting rates of reaction

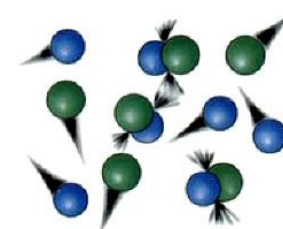
Low surface area High surface area



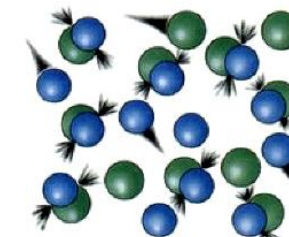
one big lump (slow reaction)



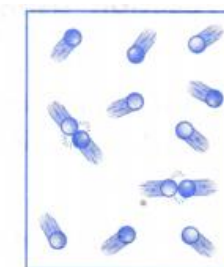
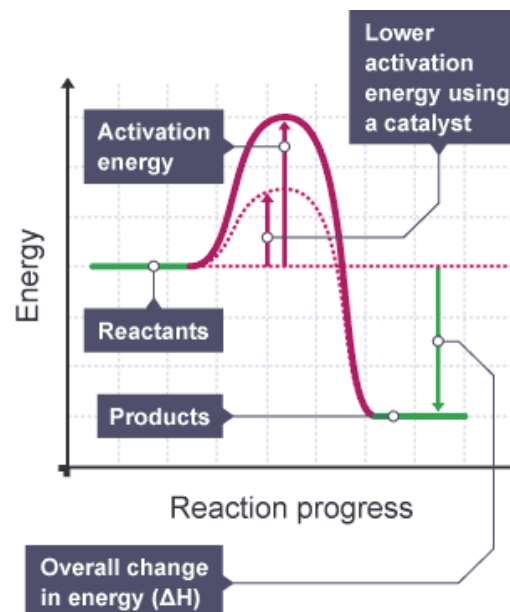
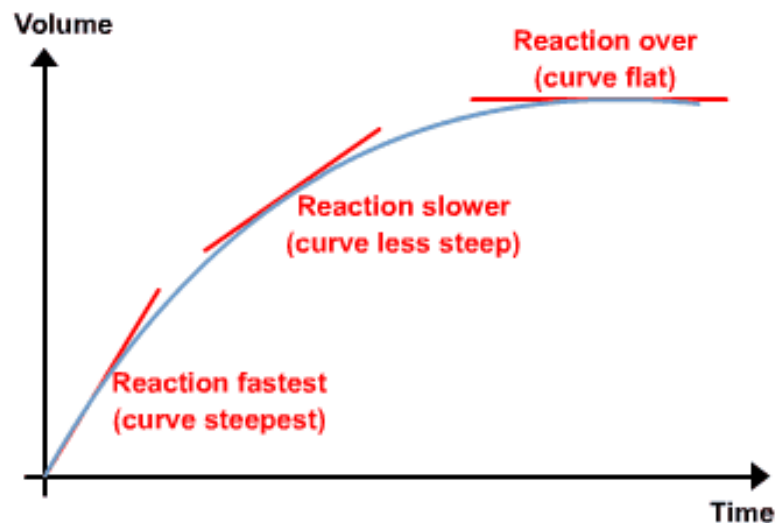
several small lumps (fast reaction)



Low concentration = Few collisions

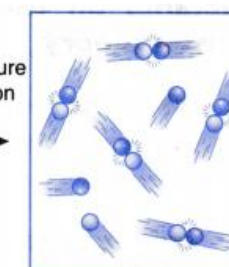


High concentration = More collisions



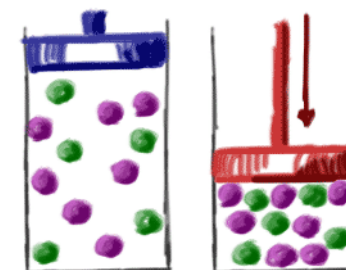
- At a lower temperature, the particles move slower.
- Frequency of collision is lower.

The temperature of the reaction increases



- At a higher temperature, the particles move faster.
- Frequency of collision is higher.

Figure Temperature of a reaction controls the frequency of collision



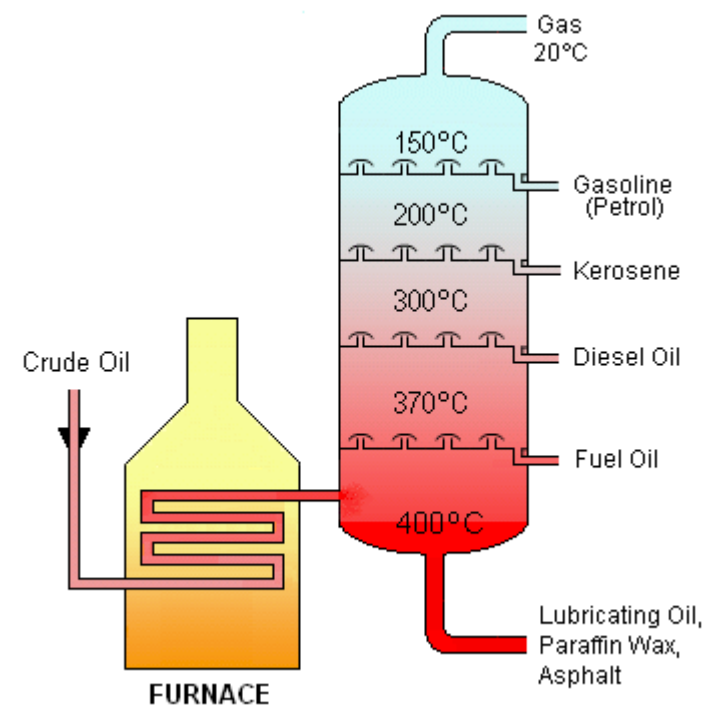
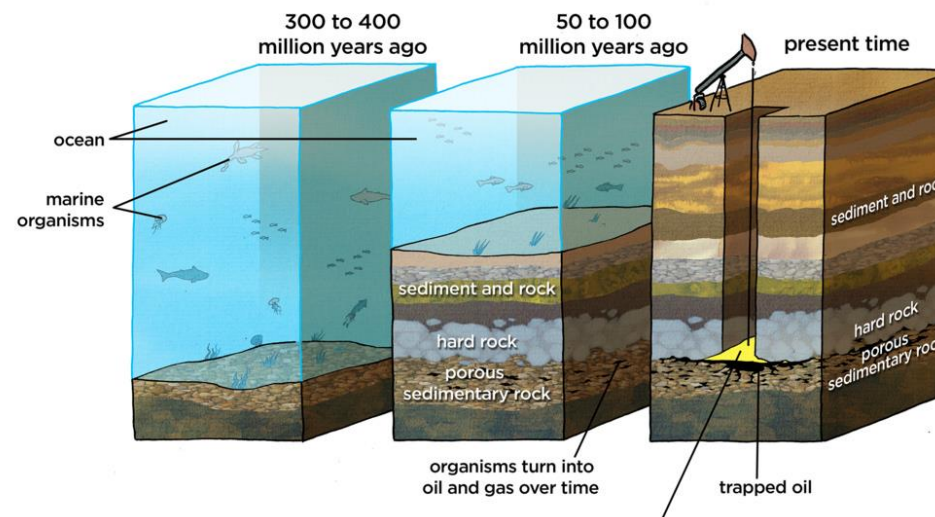
AS PRESSURE INCREASES, THE GAS MOLECULES CAN HAVE MORE COLLISIONS.

Key Terms

Knowledge Organiser – Organic Chemistry

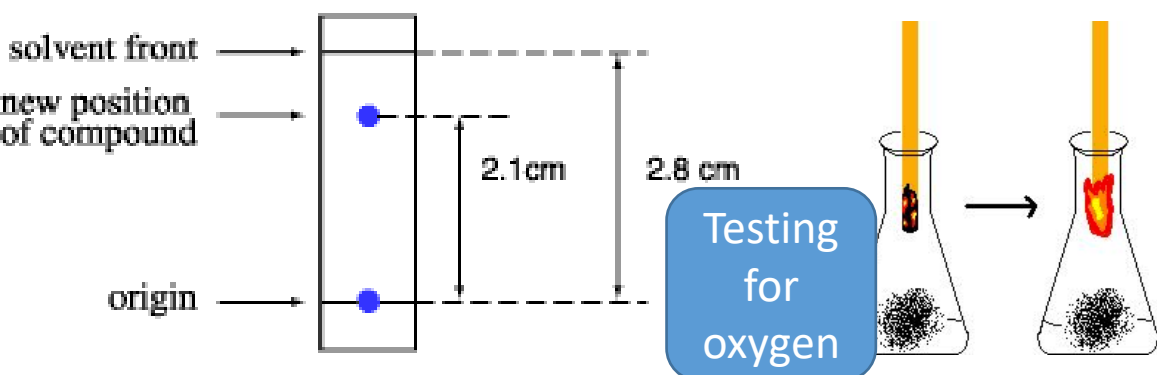
Diagrams

Biomass	A resource made from living or recently living organisms.
Hydrocarbon	A compound containing hydrogen and oxygen only.
Alkanes	A homologous series of saturated hydrocarbons with the general formula C_nH_{2n+2} .
Saturated	A molecule that only contains single covalent bonds. It contains no double covalent bonds.
Displayed Formula	Drawing of a molecule showing all atoms and bonds.
Homologous Series	A family of compounds with the same general formula and similar chemical properties.
Fractional Distillation	A method used to separate miscible liquids with different boiling points.
Fraction	A mixture of molecules with similar boiling points.
Complete Combustion	When a substance burns with a good supply of oxygen.
Flammability	How easily a substance catches fire; the more flammable, the more easily it catches fire.
Viscosity	How easily a liquid flows; the higher the viscosity the less easily it flows.
Alkenes	A homologous series of unsaturated hydrocarbons with the general formula C_nH_{2n} .
Unsaturated	A molecule that contains one or more double covalent bonds.
Polymer	A long chain molecule in which lots of small molecules (monomers) are joined together.

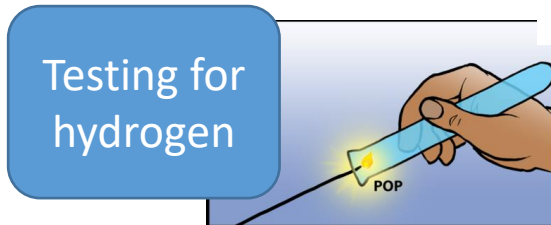
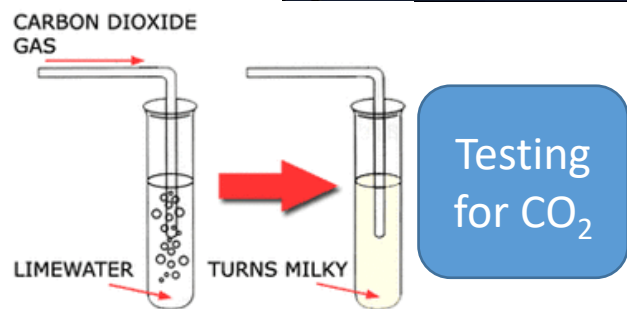
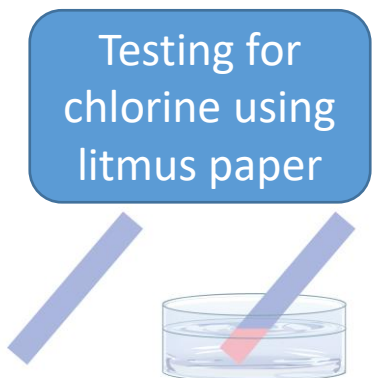


Knowledge Organiser – Chemical Analysis

Pure substance	A single element or compound that is not mixed with any other substance.
Formulation	A mixture that has been designed as a useful product.
Chromatography	A technique that can be used to separate mixtures and the identify substances.

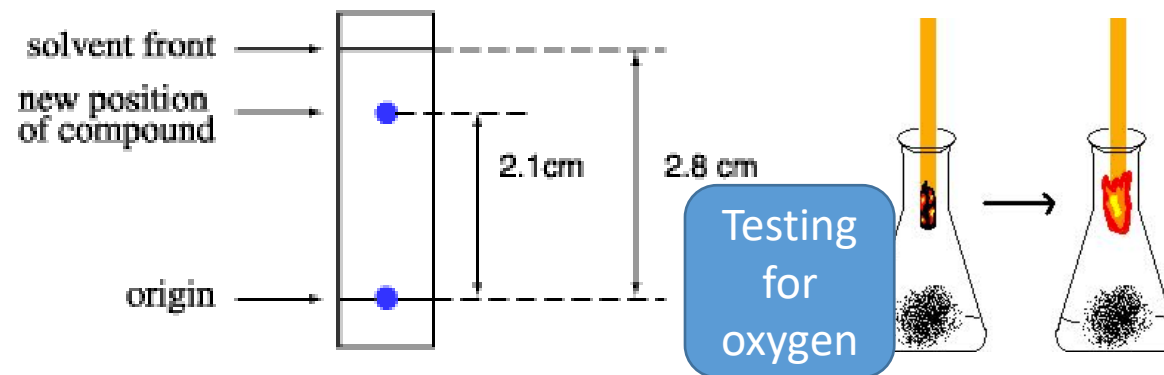


$$R_f = \frac{2.1}{2.8} = 0.75$$

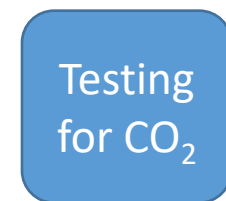
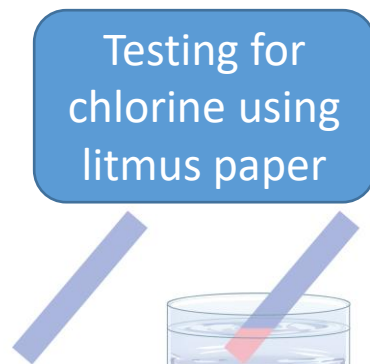


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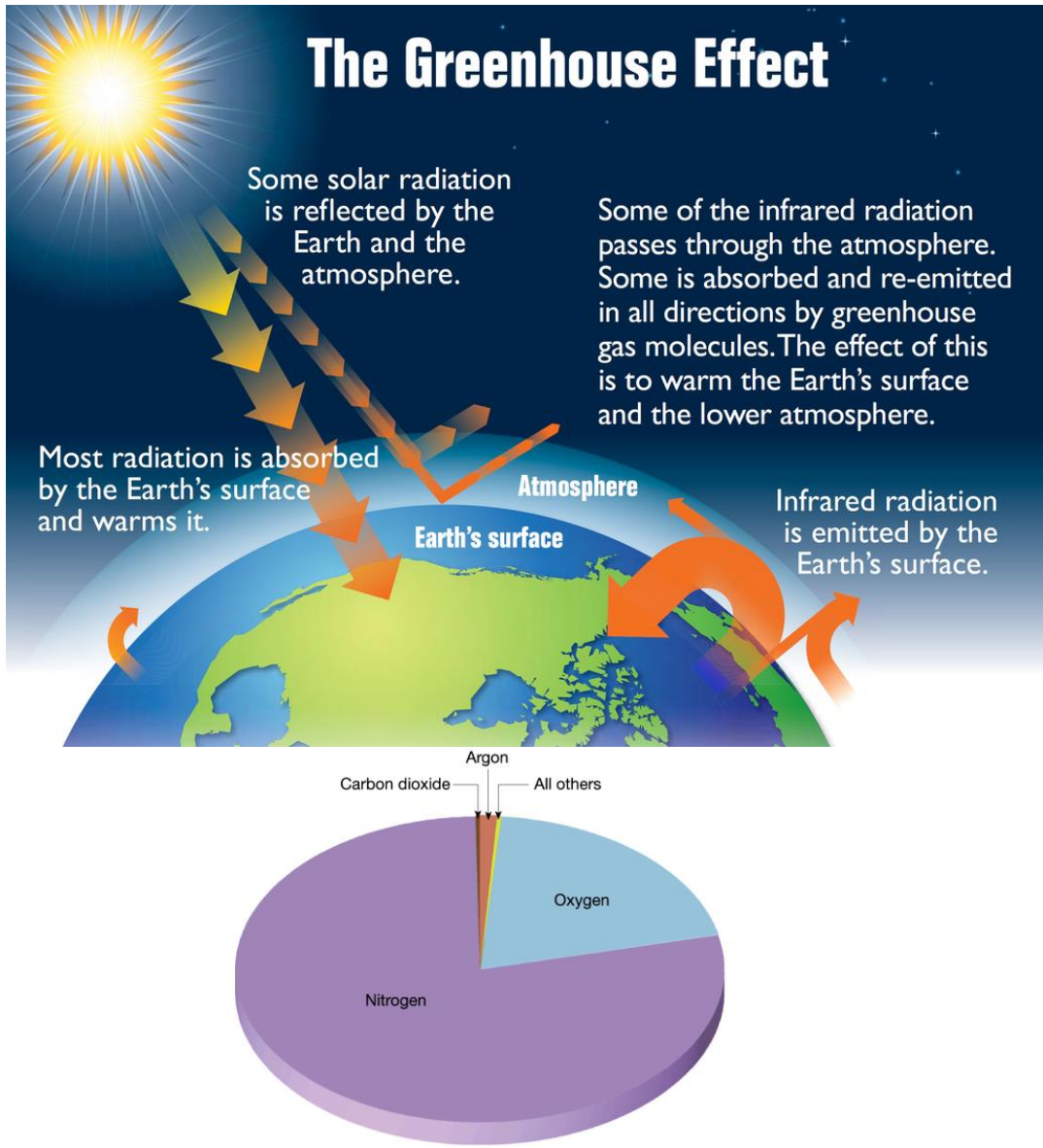
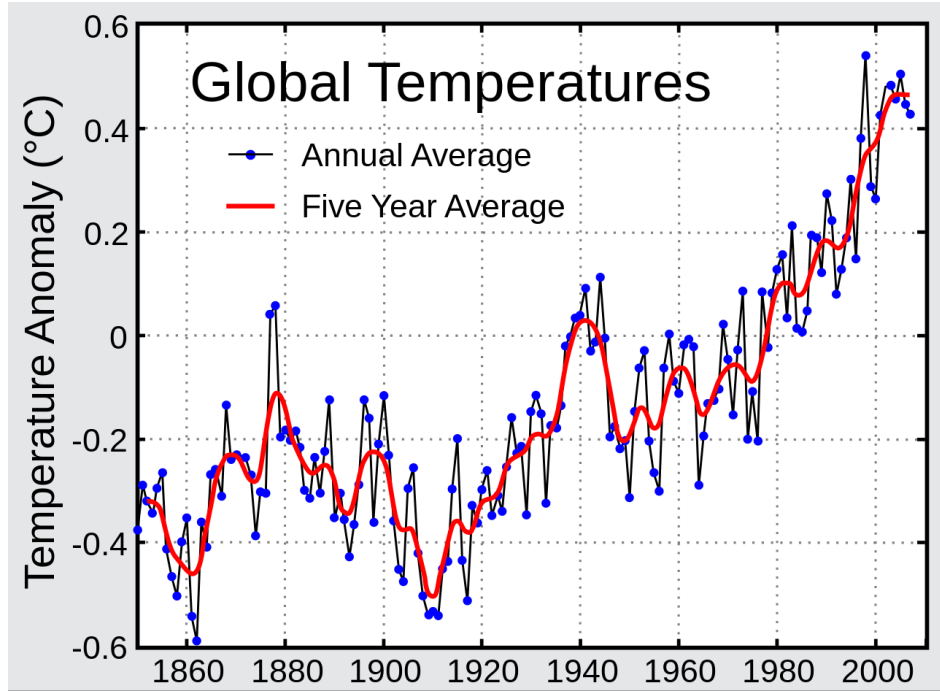


Key Terms

Knowledge Organiser – Chemistry of the Atmosphere

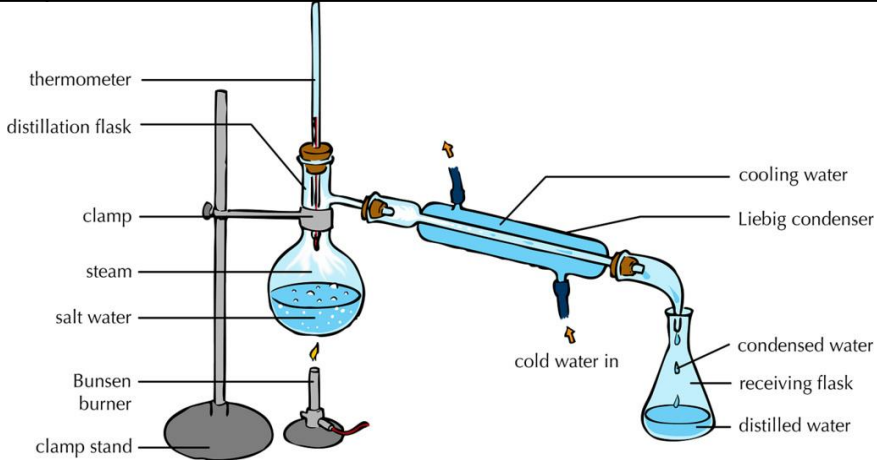
Diagrams

Greenhouse gas	A gas that absorbs long wavelength infrared radiation given off by the Earth but does not absorb the suns radiation.
Global warming	An increase in the temperature of the Earths surface.
Water stress	A shortage of fresh water.
Carbon footprint	The amount of carbon dioxide and other greenhouse gases given out over the full life cycle of a product, service or event.
Carbon neutral	Fuels and processes whose use results in zero net release of greenhouse gases to the atmosphere.



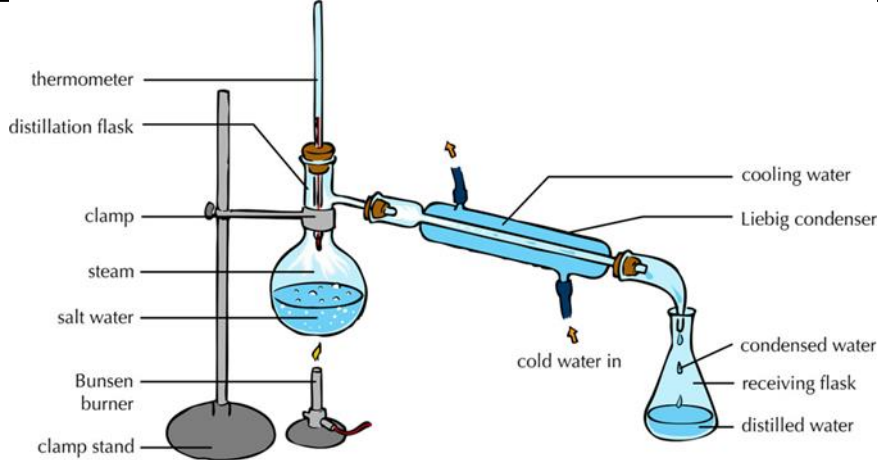
Knowledge Organiser – Using the Earths Resources

Finite resource	A resource that cannot be replaced once it has been used.
Renewable resource	A resource that we can replace once we have used it.
Sustainable development	Using resources to meet the needs of people today without preventing people in the future from meeting theirs.
Life cycle assessment	An examination of the impact of a product on the environment throughout its life.
Value judgement	An assessment of a situation that may be subjective, based on a persons opinion and / or values.
Desalination	Process to remove dissolved substances from sea water.
Ore	A rock from which a metal can be extracted for profit.
Phytomining	The use of plants to absorb metal compounds from soil as part of metal extraction.
Bioleaching	The use of dilute acid to produce soluble metal compounds from insoluble metal compounds.
Leachate	A solution produced by leaching or bioleaching.



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Key Terms

Scalar	A quantity with only magnitude (size) and no direction.
Vector	A quantity with both magnitude and direction.
Velocity	A speed in a defined direction.
Displacement	A distance travelled in a defined direction.
Force	A push or a pull.
Contact force	A force that can be exerted between two objects when they touch.
Non-contact force	A force that can sometimes be exerted between two objects that are physically separated.
Centre of mass	The point through which the weight of an object can be taken to act.
Resultant force	A number of forces acting on an object may be replaced by a single force that has the same effect as all the forces acting together. This single force is called the resultant force.
Joule	The unit of work.
Elastic deformation	When an object returns to its original length after it has been stretched.
Inelastic deformation	When an object does not return to its original length after it has been stretched.
Extension	The difference between the stretched and unstretched lengths of a spring.
Limit of proportionality	The point beyond which a spring will be permanently deformed. Elastic deformation stops and inelastic deformation starts.

w = m x g

W = F x d

F = k x e

E_e = ½ke²

weight = mass x gravity.

Work done = force x distance moved

Force = spring constant x extension

Elastic potential energy = 0.5 x spring constant x extension²

Knowledge Organiser – Forces

Applied forces

20N

40N

25N

25N

Resultant force

20N

zero resultant

Spring

Ruler

Masses

Key Terms

Knowledge Organiser – Motion

Diagrams

Terminal velocity	When the weight of a falling object is balanced by resistive forces.
Inertia	Inactivity. Objects remain in their existing state of motion – at rest or moving with a constant speed in a straight line – unless acted on by an unbalanced force.
Thinking distance	The distance a car travels while the driver reacts.
Braking distance	The distance a car travels while the car is stopped by the brakes.
Stopping distance	The sum of the thinking distance and braking distance
Closed system	A system with no external forces on it.

$$s = d \div t$$

$$\text{speed} = \text{distance} \div \text{time.}$$

$$a = (v - u) \div t$$

$$\text{acceleration} = \text{change in velocity} \div \text{time.}$$

$$F = m \times a$$

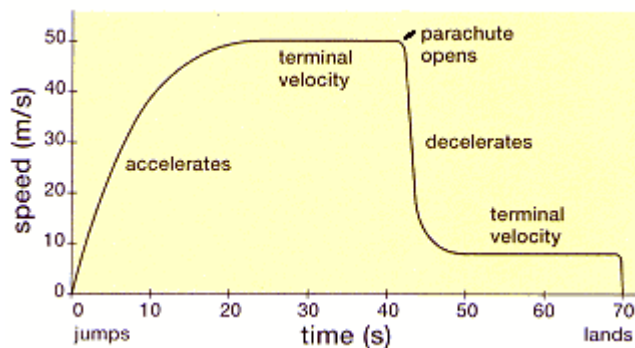
$$\text{Force} = \text{mass} \times \text{acceleration.}$$

$$p = m \times v$$

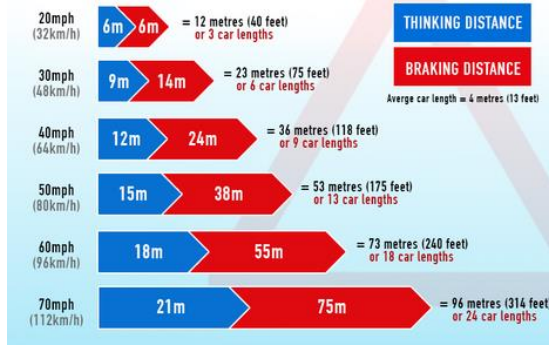
$$\text{momentum} = \text{mass} \times \text{velocity.}$$

$$(mv - mu) = F \times t$$

$$\text{change in momentum} = \text{Force} \times \text{time.}$$



STOPPING DISTANCES



Distance-time graphs

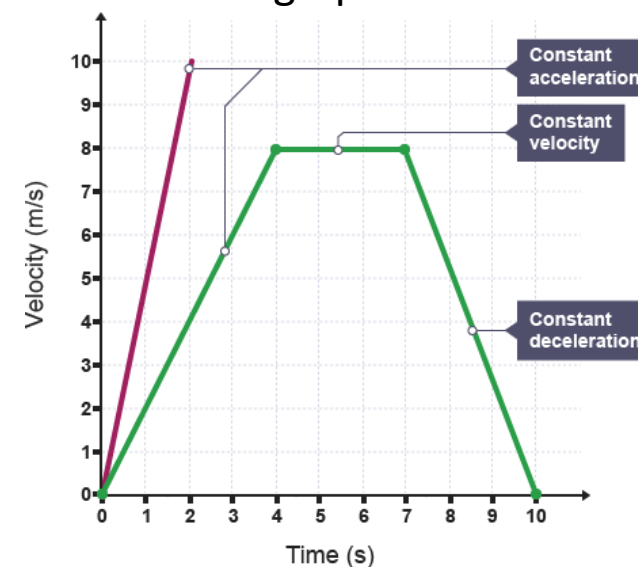
$$\text{Gradient (dis/time)} = \text{speed}$$



Velocity-time graphs

$$\text{Gradient (velocity/time)} = \text{acceleration}$$

$$\text{Area under graph} = \text{distance travelled}$$



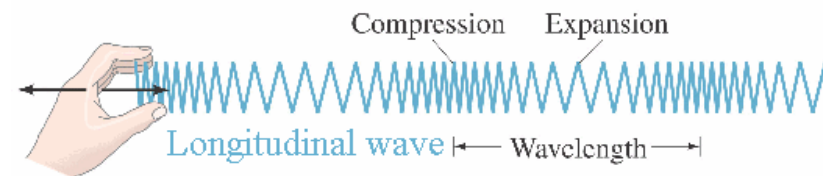
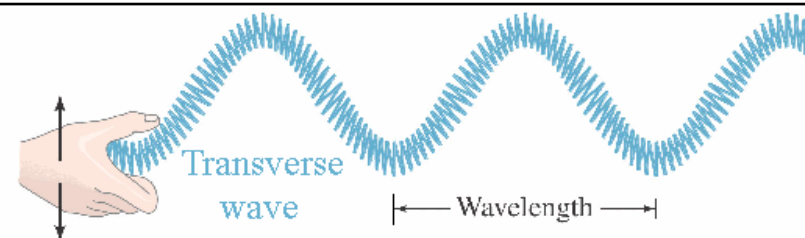
Key Terms

Knowledge Organiser – Waves

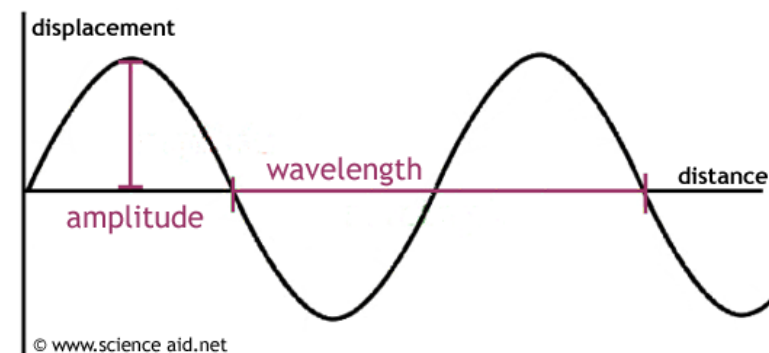
Diagrams

Transverse wave	A wave in which the vibration causing the wave is at right angles to the direction of energy transfer.
Longitudinal wave	A wave in which the vibration causing the wave is parallel to the direction of energy transfer.
Amplitude	The height of the wave measured from the middle (the undisturbed position of the water).
Wavelength	The distance from a point on one wave to the equivalent point on the next wave.
Frequency	The number of waves produced each second. It is also the number of waves passing a point each second.
Period	The time taken to produce one wave.
Angle of refraction	The angle between the refracted ray and the normal.

$$v = f \times \lambda \quad \text{velocity} = \text{frequency} \times \text{wavelength.}$$



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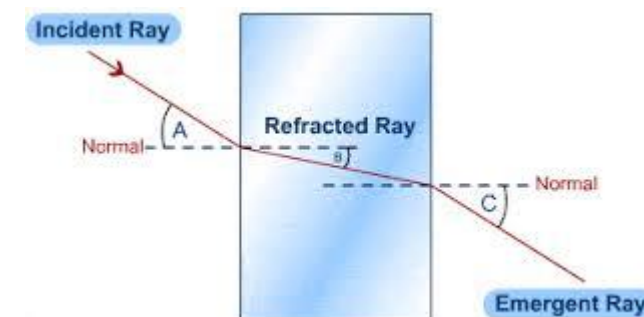


The Electromagnetic Spectrum

Wavelength in meters



About the size of:

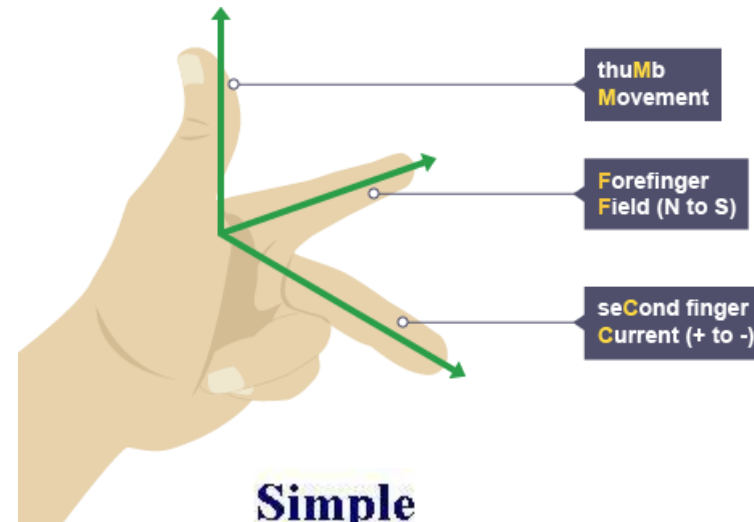
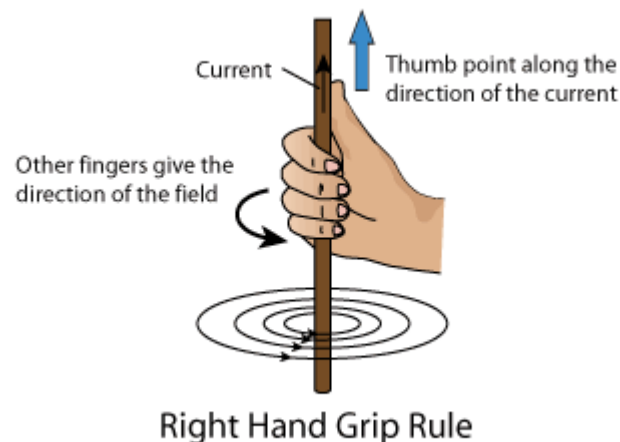
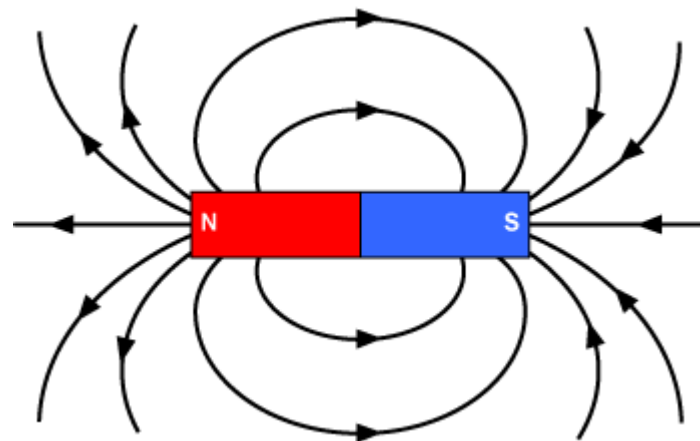


Key Terms

Knowledge Organiser – Magnetism and Electromagnetism

Diagrams

Magnetic	Materials that are attracted by a magnet.
North-seeking pole	The end of the magnet that points north.
South-seeking pole	The end of the magnet that points south.
Permanent magnet	A magnet which produces its own magnetic field. It always has a north and a south pole.
Induced magnet	A magnet which becomes magnetic when it is placed in a magnetic field.
Right-hand grip rule	A way to work out the direction of the magnetic field in a current-carrying wire if you know the direction of the current.
Solenoid	A solenoid is a long coil of wire.
Flux density	The number of lines of magnetic flux in a given area. $F = B \times I \times L$ Force = magnetic flux density x current x length
Motor effect	The force produced between a conductor carrying a current within a magnetic field and the magnet producing the field



Simple Electric Motor

