

Science Year 7 Topic 7

Year 8

Term 1



1. Biology

Respiration	A chemical reaction that takes place in the mitochondria to produce energy.
Aerobic	In the presence of oxygen
Anaerobic	Without enough oxygen

Word equation for aerobic respiration in plants and animals:

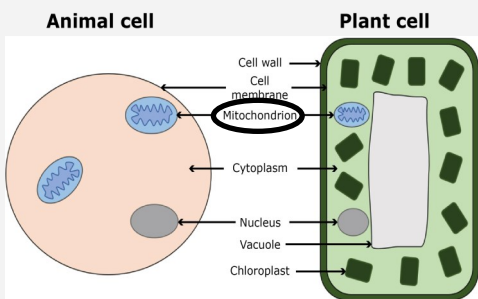
Glucose + oxygen → carbon dioxide + water + energy

Word equation for anaerobic respiration in animals

Glucose → Lactic acid + energy

Word equation for anaerobic respiration in fungi e.g. yeast

Glucose → carbon dioxide + ethanol + energy



2. Biology

Problems with anaerobic respiration

- Produces much **less energy** from glucose compared to aerobic respiration
- Lactic acid is a **poisonous** waste product

Effect of Exercise on the body

- Muscles need more energy when exercising
- The rate of respiration rate increases
- More oxygen is needed in the muscle cells
- Breathing rate increases to get more oxygen into the blood
- Heart rate increases to get the oxygen to the muscles

Breathing rate stays high after exercise to allow for enough oxygen to break down any lactic acid. The amount of oxygen needed is called, ‘**oxygen debt**’.



3. Chemistry

Exothermic Reaction	A reaction which releases energy in to the surroundings. The temperature of the surroundings increases .
Endothermic reaction	A reaction which absorbs energy from the surroundings. The temperature of the surroundings decreases .
Catalyst	A substance which increases the rate of a chemical reaction without being used up.

Experiment	Starting Temperature (°C)	Ending Temperature (°C)	Exothermic or Endothermic?
1	4	25	Exothermic
2	120	75	Endothermic
3	- 3	42	Exothermic

4. Chemistry

Exothermic Reaction Examples

Formation of snow

Burning wood

Endothermic Reaction Examples

Frying Eggs

Photosynthesis

5. Physics

Energy	The ability to do work. Unit = Joules (J)
Renewable	An energy source that will not run out in the next 1 million years e.g. solar and wind.
Non-Renewable	An energy source that will run out in the next 1 million years e.g. coal, oil or gas.
Fossil Fuel	Non-renewable energy resources formed from the remains of dead organisms over millions of years.
Power	The rate of energy transfer. Unit = Watts (W) Power (W) = Energy (J) ÷ time (s)

Cost of electricity (p) = energy transferred (kwh) x cost per kwh

6. Physics

Converting Units

1000 J = 1kJ

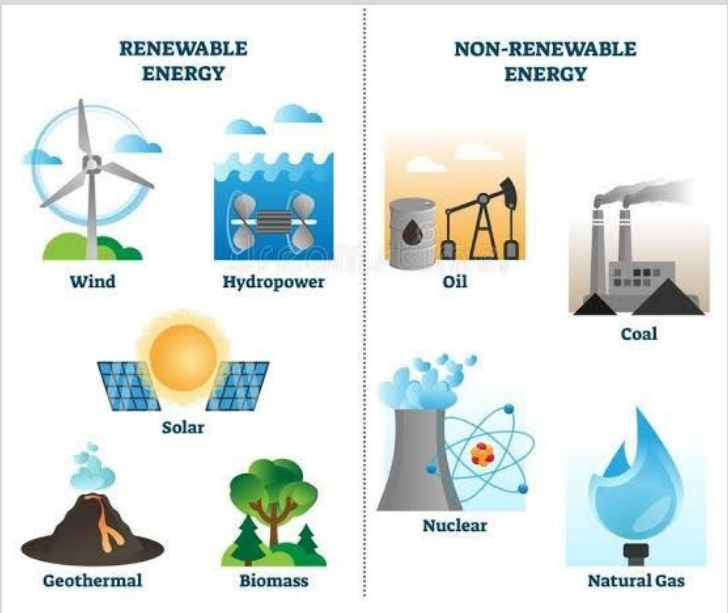
1000 W = 1kW

3, 600, 000 J = 1kWh

60 seconds = 1 minute

60 minutes = 1 hour

3600 seconds = 1 hour



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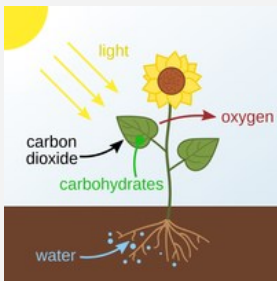
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Biology

Photosynthesis occurs in the **chloroplast**.
Word equation for photosynthesis in plants:
Carbon dioxide + water → oxygen + glucose

Van Helmont demonstrated that plants do not grow from consuming soil, but from water.

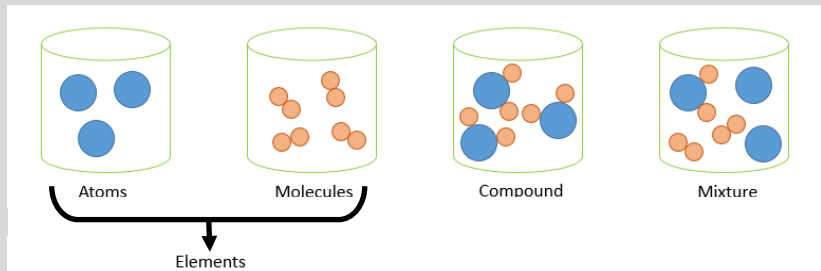


Adaptation of leaves

Adaptation	Function
Thin	Short diffusion distance for gases exchange in the leaf
Flat	Provides a large surface area to increase absorption of light
Chloroplast	Contains chlorophyll to absorb light for photosynthesis
Stomata	A pore which allows gases to move in and out of the leaf. Surrounded by guard cells which control when stomata open and close

Chemistry

Element	A substance that contains only one type of atom
Atom	The smallest part of an element
Compound	Two or more elements chemically bonded together e.g. CO ₂
Mixture	More than one different atom/element/compound not chemically bonded together e.g. air, sea water
Pure	A substance containing only one type of atom or compound
Impure	A substance containing more than one type of atom or compound



Physics density

Particle	A single atom or molecule
Physical Change	A reversible change, no new products are formed. For example, evaporating water to steam
Chemical Change	An irreversible change, new products are formed. For example, combustion, oxidation
Conservation of mass	Matter cannot be created or destroyed. Mass is the same at the start and end of a chemical reaction.
Density	Mass per unit of volume. Density = mass ÷ volume
Mass	The amount of matter in an object Unit = g or kg
Volume	The amount of space an object takes up Unit = cm ³ or m ³

Deforestation—Where natural forests are cleared through logging or burning.

Why is deforestation happening?

- Create room for grazing animals like cows and sheep
- Use resources from trees like palm oil
- Wood can be used for building

Effect of deforestation on **organisms**

- Loss of habitat
- Loss of food sources
- Lead to a decrease in the number of species

Effect of deforestation on the **atmosphere**

- Trees cannot photosynthesise
- Carbon dioxide levels are increasing
- Oxygen levels are decreasing

Biodiversity—the **range** of organisms in a habitat

Methods of **conservation**:

- Education
- Legal protection of habitats
- Captive breeding
- Zoos
- Seed banks

Separating Techniques

Solute: The solid that dissolves

Solvent: The liquid that dissolves the solid

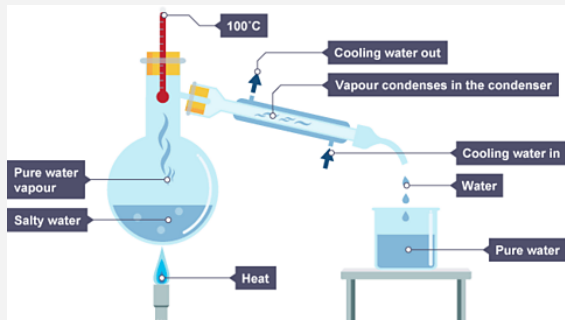
Solution: Mixture of the solute and solvent

Soluble: Able to dissolve

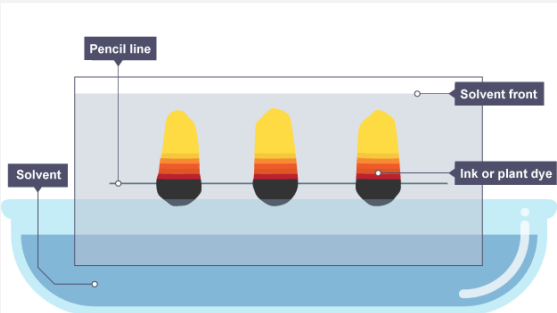
Insoluble: Unable to dissolve



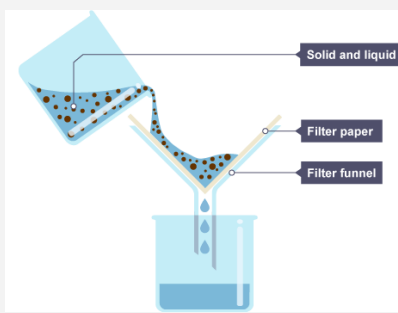
Crystallisation: separate liquid from soluble solid



Distillation: separate a solvent from solution

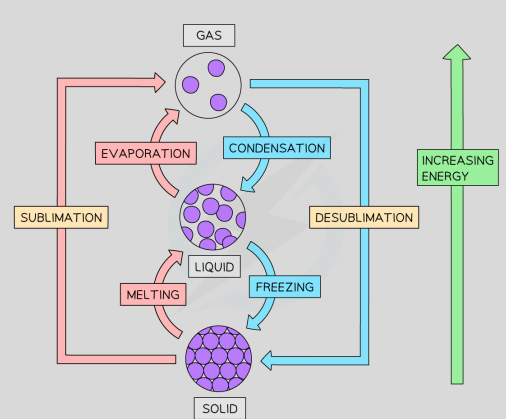


Chromatography: separate a mixture of solvents



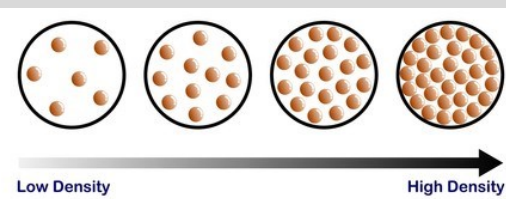
Filtration: separate insoluble solid from a liquid

Changes of state



Density

Solids are more dense than liquids, and liquids are more dense than gases. The closer the particles are in a substance, the higher the density.



Conservation of mass

Mass is only conserved in a closed system.

Closed system—gases are not free to escape.

Open system—gases are free to escape

Iron + oxygen → Iron oxide
3g 1.5g → 4.5g

