

Year 8 Introduction

Key vocabulary

Accurate	Close to the true value you are measuring
Bias	When the views of the experimenter affects the outcome
Conclusion	What you write down to say what you have found out
Continuous	Variables where the values can have any number
Control measure	An action take to remove a hazard to reduce the risks
Control variable	One that remains unchanged in an investigation
Dependent variable	What you measure or observe in an investigation
Discontinuous	Variables where the values are words or discrete numbers
Evaluate	To discuss the quality of data collected during an investigation and suggest improvements to the method
Experimental error	Variations in measurements owing to the method or equipment
Hazard	A situation that presents a threat to people
Hypothesis	An explanation you can test that includes a reason
Independent variable	What you change in an investigation to see how it affects the dependent variable
Interval	The gap between values of independent variable
Line of best fit	A straight or curved line thar shows the pattern of data
Precise	Describes a set of repeat measurements that are close together
Random error	When the same quantity is measured with inconsistent values
Range	The maximum and minimum values of a variable
Repeatable	When repeat readings are close together
Risk	How likely something is to be harmful
Risk assessment	A description of how you will make it less likely that people will be injured and what to do if that happens
Systematic error	Arises from an inaccuracy in the system and gives rise to errors of the same value

Planning an investigation

This is a description of how you will complete the investigation. It consists of:

- Identifying the variables
- Listing the equipment
- Method
- Risk Assessment

Collecting results

Most investigations collect results using a results table

Independent Variable	Dependent Variable

Using results

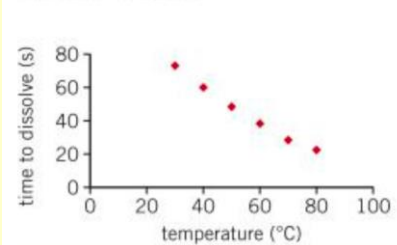
When you have repeat readings you often calculate a mean

Mean =
$$\frac{\text{Sum of All Data Points}}{\text{Number of Data Points}}$$

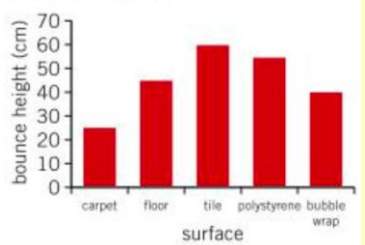
Graphs are used to present results.

- line graphs are used for continuous data
- Bar graphs are used with discontinuous data

You plot a line graph:



You plot a bar chart:

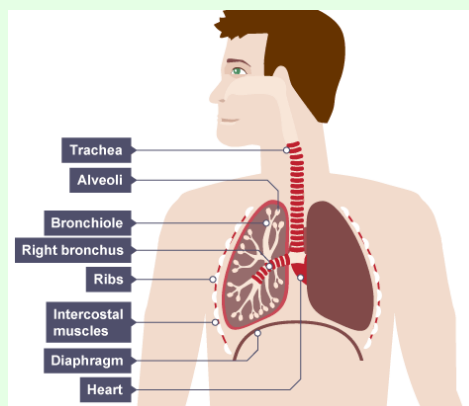


Year 8 Organisms

Key vocabulary

Addiction	A need to keep taking a drug in order to feel normal
Alcoholic	A person who is addicted to alcohol
Alveolus	Small air sacs found at the end of each bronchiole where gas exchange takes place
Asthma	A lung disorder in which swelling causes the bronchioles to narrow the airways
Breathing	The movement of air in and out of the lungs
Bronchiole	Small tube in the lungs
Bronchus	One of two tubes which carry air into the lungs
Depressant	A drug that slows down the body's reactions
Drug	Chemical substance that affects the way your body works
Ethanol	The drug found in alcoholic drinks
Exhale	Breathing out to remove carbon dioxide
Gas exchange	The transfer of gases between an organism and the environment
Haemoglobin	The substance in blood that carries oxygen around the body
Inhale	Breathing in to take in oxygen
Lung Volume	Measure of the amount of air breathed in and out
Medicinal drug	Drug that has medical benefit for your health
Plasma	Liquid that transports blood cells and other substances
Recreational drug	Drug that is taken for enjoyment
Respiratory system	Organ system which replaces oxygen and removes carbon dioxide from the blood
Ribs	Bones which surround the lungs to form the ribcage
Trachea	Tube that carries air from the mouth and nose to the lungs

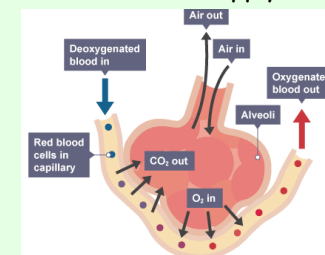
Respiratory System



Gas Exchange

The alveoli are adapted for gas exchange by having:

- Large surface area
- Single cell lining
- Good blood supply



Breathing

	Inhaling	Exhaling
Diaphragm	Contracts and moves downwards	Relaxes and moves upwards
Intercostal muscles	Contract, moving the ribs upwards and outwards	Relax, letting the ribs move downwards and inwards
Volume of ribcage	Increases	Decreases
Pressure inside the chest	Decreases below atmospheric pressure	Increases above atmospheric pressure
Movement of air	Moves into the lungs	Moves out of the lungs

Effects of Alcohol

- Slows down the nervous system
- Causes liver damage
- Can be addictive
- Can cause serious developmental damage to unborn fetuses

Effects of Smoking

Cigarettes contain:

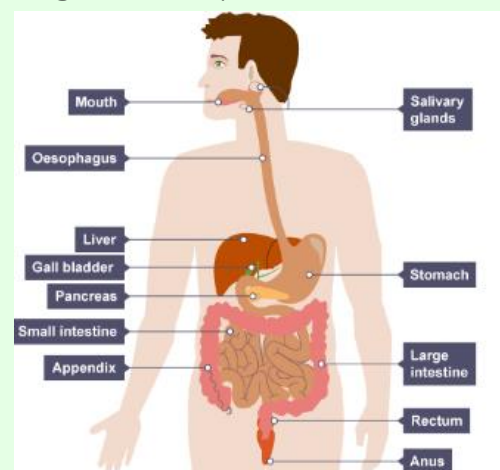
- Nicotine - An addictive drug
- Tar - Can cause cancer
- Carbon monoxide - Prevents red blood cells transporting oxygen

Year 8 Organisms

Key vocabulary

Anus	Muscular ring through which faeces passes out of the body
Balanced diet	Eating foods containing the right nutrients in the correct amounts
Bile	Substance that breaks down fat droplets
Carbohydrase	Enzyme that breaks down carbohydrate into sugars
Carbohydrate	Nutrients that provide the body's main source of energy
Deficiency	A lack of minerals that causes poor growth
Dietary fibre	Parts of a plant that cannot be digested. Helps eliminate waste
Digestion	Process in which large molecules are broken into smaller ones
Enzyme	Substance that speeds up the chemical reactions in digestion
Food test	Chemical test to detect the presence of particular nutrients
Gullet	Tube that food travels down to the stomach
Gut bacteria	Microbes that live in the intestine and help break down food
Large intestine	Lower part of the intestine where water is absorbed
Lipase	Enzyme that breaks down lipids into fatty acid and glycerol
Lipids	Nutrients that provide energy and insulate the body
Mineral	Essential nutrient needed in small amounts to keep healthy
Nutrient	Essential substance that your body needs to survive
Obese	Extremely overweight
Protease	Enzyme that breaks down protein into amino acids
Protein	Nutrient needed for growth and repair
Rectum	Faeces are stored here before being passed out the body
Small intestine	Where digestion is completed and nutrients are absorbed
Stomach	Organ where digestion starts. Acidic juices kill microbes
Villi	Projections in the small intestine to increase area for absorption
Vitamin	Essential nutrient needed in small amounts to keep healthy

Digestive System



Food Tests

Test for starch

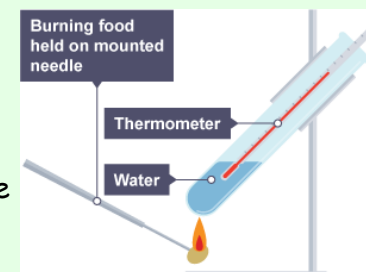
- Iodine
- Positive: **blue/black**
- Negative: stays **orange**

Test for glucose

- Benedict's solution + heat
- Positive: **red**
- Negative: stays **blue**

Burning Foods Practical

1. Record the initial temperature of the water
2. Burn the food under the test tube
3. The energy from the food heats the water
4. Record the final temperature



Enzymes in Digestion

Enzymes are biological catalysts, they speed up chemical reactions in the body.

Each type of nutrient has its own specific enzyme to break it down

- Carbohydrases: Carbohydrate → Sugars
- Proteases: Protein → Amino acids
- Lipases: Lipids (fats) → Fatty acids + Glycerol

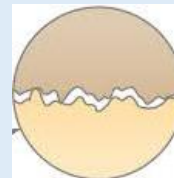
Year 8 Forces

Key vocabulary

Air resistance	A force on an object moving through air making it slow down
Compression	Force squashing or pushing together, which changes the shape of an object
Contact force	A force that acts when an object is in contact with a surface
Deform	When an object is stretched or squashed, which required work
Deformation	Changing shape due to force
Drag force	The force acting on an object moving through air or water that causes it to slow down
Elastic limit	The point beyond which a spring will not return to its original length when the force is removed
Extension	The difference between the original length of an object and the length when you apply a force
Friction	Force opposing motion which is caused by interaction of surfaces moving over each other
Hooke's law	A law that says that if you double the force on an object, the extension will double
Incompressible	Cannot be compressed or squashed
Newton	Unit for measuring forces (N)
Reaction	The support force provided by a solid surface like a floor
Resultant force	Single force which can replace all the forces acting on an object and have the same effect
Tension	Force extending or pulling apart
Upthrust	The upward force that a liquid or gas exerts on a body floating in it
Water resistance	A force on an object moving through water causing it to slow down

Friction

Caused by two solid surfaces in contact



Drag

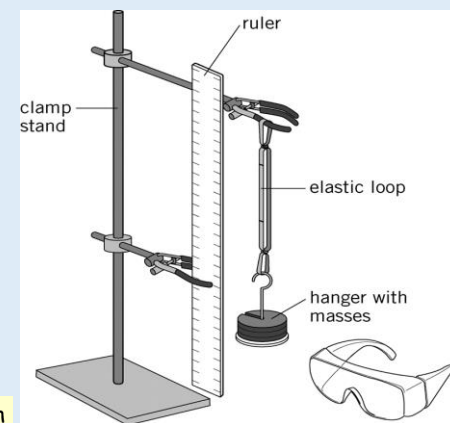
Caused by a moving object pushing air or water particles out the way



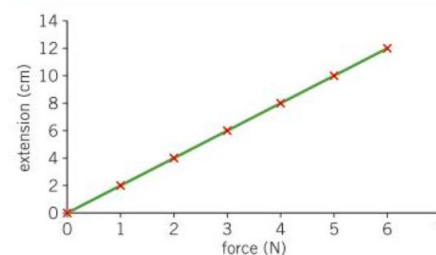
Investigating elasticity

1. Set up equipment as shown
2. Measure the initial length
3. Attach a 1N weight
4. Measure the new length
5. Repeat with 2N, 3N, 4N and 5N weights
6. Calculate the extension using the following equation

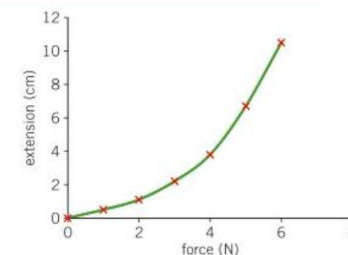
$$\text{Extension} = \text{New length} - \text{Initial length}$$



Some materials, like a spring will follow Hooke's Law and give a linear relationship. Other materials will be non-linear.



▲ This graph shows how the extension of a spring changes as you pull it.



▲ This graph shows the relationship between force and extension for poly(ethene). It is not linear.

Year 8 Forces

Key vocabulary

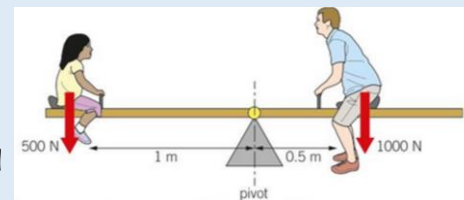
Atmospheric pressure	Pressure caused by the weight of the air above a surface
Centre of gravity	The point in an object where the force of gravity seems to act
Equilibrium	State of an object when opposing forces are balanced
Input force	The force you apply to a machine
Law of moments	An object is in equilibrium if the clockwise moment equals the anticlockwise moment
Lever	A type of machine which is a rigid bar that pivots around a point
Liquid pressure	The pressure produced by collisions of particles in a liquid
Moment	A measure of the ability of a force to rotate an object about a pivot
Newton metres	The unit of moment
Newtons per metre squared	A unit of pressure
Output force	The force that is applied to the object moved by a machine
Pivot	The point about which a lever balances and rotates
Pressure	The ratio of force to surface area, in N/m^2 , and how it causes stress in solids
Simple machine	A machine, such as a lever or pulley system, which changes the size of the force by moving a force over a bigger or smaller distance
Stress	The effect of a force applied to a solid, found using $\text{stress} = \text{force}/\text{area}$
Work	The transfer of energy when a force moves an object through a distance. Measured in Joules

Moments

The turning effect of a force is called a moment.
Moments can be calculated using the following equation:

$$\text{Moment} = \text{Force} \times \text{Distance}$$

If the clockwise and anti-clockwise moments acting on a object are the same size, then the object will be balanced



Pressure in solids

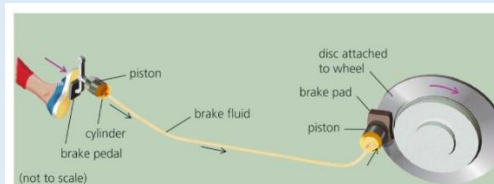
When an object is on a surface it exerts pressure on that surface. This is also called stress.
Pressure can be calculated using the following equation:

$$\text{Pressure} = \text{Force} \div \text{Area}$$

Pressure in liquids

Pressure in liquids is caused by the particles pushing on each other and on surfaces.

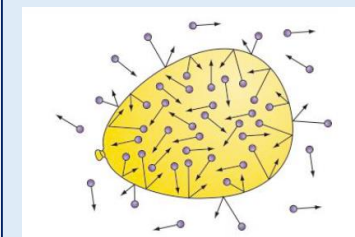
Liquids cannot be compressed so they pass on any pressure that is applied to them. This is how hydraulic braking systems work.



Pressure in gases

Every time the particles of a gas hit the sides of the container they exert pressure.

The more times they hit the sides the greater the pressure.



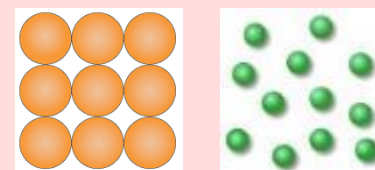
Year 8 Matter

Key vocabulary

Atom	The smallest part of an element that can exist
Chemical bond	Force that holds atoms together in molecules
Chemical formula	A formula that shows the elements present in a compound and their relative proportions
Chemical symbols	A one or two letter code for an element that is used by scientists in all countries
Compound	Pure substances made up of atoms of two or more elements, strongly joined together
Elements	Substances that all other material are made up of, and which contain only one type of atom
Group	A column on the Periodic Table. The elements in a group have similar properties
Metal	Elements on the left of the Periodic Table. Most metals are shiny and good conductors of heat and electricity
Mixture	Made of two or more pure substances that are mixed, but not chemically joined, together.
Molecule	A group of two or more atoms joined strongly together.
Non-metal	Elements on the right of the Periodic Table
Period	A row on the Periodic Table
Periodic Table	A table which shows all the elements arranged in columns and rows. Elements with similar properties are grouped together
Pure substance	A single material with no other substances mixed with it

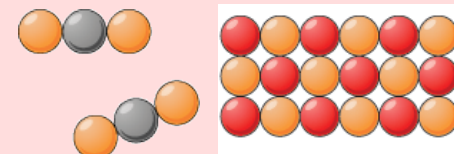
Elements

Substances made of only one type of atom. Elements are found on the Periodic Table



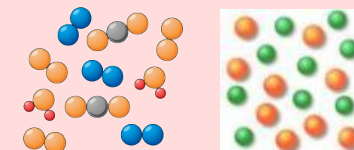
Compounds

Substances made of two or more different elements chemically bonded together



Mixtures

Substances made of two or more different elements not chemically bonded together



Periodic Table

The Periodic Table contains all the known elements.

- The columns are called groups. Elements in the same group have similar properties
- The rows are called periods. Elements in the same period do not have similar properties

	1	2								3	4	5	6	7	8	9	10

H
hydrogen
1

										Key									
										relative atomic mass									
										atomic symbol									
										atomic (proton) number									

7 Li lithium 3	9 Be beryllium 4											11 B boron 5	12 C carbon 6	14 N nitrogen 7	16 O oxygen 8	19 F fluorine 9	20 Ne neon 10
23 Na sodium 11	24 Mg magnesium 12											27 Al aluminum 13	28 Si silicon 14	31 P phosphorus 15	32 S sulfur 16	35.5 Cl chlorine 17	Ar argon 18
39 K potassium 19	40 Ca calcium 20	45 Sc scandium 21	48 Ti titanium 22	51 V vanadium 23	52 Cr chromium 24	55 Mn manganese 25	56 Fe iron 26	59 Co cobalt 27	59 Ni nickel 28	63.5 Cu copper 29	65 Zn zinc 30	70 Ga gallium 31	73 Ge germanium 32	75 As arsenic 33	79 Se selenium 34	80 Br bromine 35	84 Kr krypton 36
85 Rb rubidium 37	88 Sr strontium 38	89 Y yttrium 39	92 Zr zirconium 40	93 Nb niobium 41	96 Mo molybdenum 42	[98] Tc technetium 43	101 Ru ruthenium 44	103 Rh rhodium 45	106 Pd palladium 46	108 Ag silver 47	112 Cd cadmium 48	115 In indium 49	119 Sn tin 50	122 Sb antimony 51	128 Te tellurium 52	127 I iodine 53	131 Xe xenon 54
133 Cs cesium 55	137 Ba barium 56	139 La lanthanum 57	178 Hf hafnium 72	181 Ta tantalum 73	184 W tungsten 74	186 Re rhenium 75	190 Os osmium 76	192 Ir iridium 77	195 Pt platinum 78	197 Au gold 79	201 Hg mercury 80	204 Tl thallium 81	207 Pb lead 82	209 Bi bismuth 83	Po polonium 84	[209] At astatine 85	[210] Rn radon 86
[223] Fr francium 87	[226] Ra radium 88	[227] Ac actinium 89	[261] Bk berkelium 94	[262] Db dubnium 104	[266] Sg seaborgium 106	[264] Bh bohrium 107	[277] Ts tennessine 116	[268] Mt meitnerium 109	[271] Ds darmstadtium 110	[272] Rg roentgenium 111							

Elements with atomic numbers 112 – 116 have been reported but not fully authenticated.

Year 8 Matter

Key vocabulary

Alkali metals	The name for elements in group 1 of the Periodic table
Chemical property	Feature of the way a substance reacts with other substances
Chemical reaction	A change in which a new substance is formed.
Displacement	Reaction where a more reactive element takes the place of a less reactive element in a compound
Group 0	Group 0 elements include helium, neon, argon and krypton.
Group 1	Group 1 elements include lithium, sodium and potassium
Group 7	Group 7 elements include fluorine, chlorine, bromine and iodine.
Halogen	The name for elements in group 7 of the Periodic Table.
Noble gases	The name for elements in group 0 of the Periodic Table
Property	A quality of a substance that describes its appearance and how it behaves
Reactive	A substance that will react vigorously with other substances
Trend	A pattern in properties, such as an increase or decrease
Unreactive	Elements that take part in few chemical reactions

Metals

Found on the left of the Periodic Table

- Shiny
- Ductile- can form wires
- Malleable- can be shaped
- Conduct heat
- Conduct electricity

Non-Metals

Found on the right of the Periodic Table

- Many are gases
- Not ductile or malleable
- Brittle- breaks easily
- Poor conductor of heat
- Poor electrical conductor

Alkali Metals

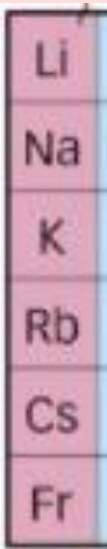
Group of elements found in group 1 of the Periodic Table
Soft metals with low melting and boiling points compared to other metals

React with water to produce hydrogen gas and a metal hydroxide solution.



Trends:

- Melting points decrease down the group
- Reactivity increases down the group
- Density increases down the group



Li
Na
K
Rb
Cs
Fr

Halogens

Group of elements found in group 7 of the Periodic Table

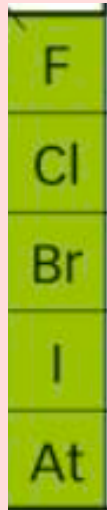
- Fluorine - yellow gas
- Chlorine - green gas
- Bromine - brown/orange liquid
- Iodine - grey solid

React with other halogens in displacement reactions. More reactive halogens will displace less reactive halogens



Trends:

- Melting points increase down the group
- Reactivity decreases down the group
- Density increases down the group



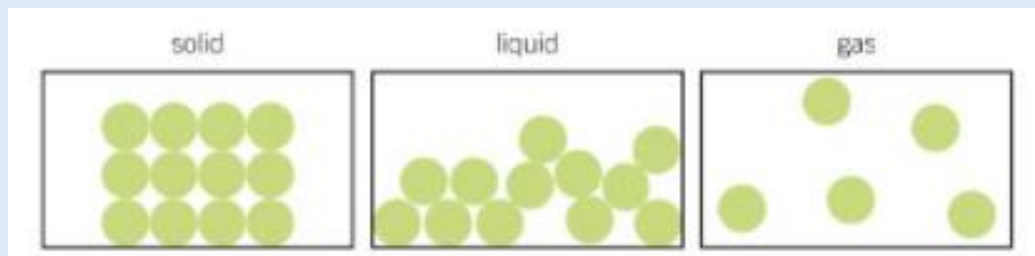
F
Cl
Br
I
At

Year 8 Energy

Key vocabulary

Celsius	A unit for temperature
Chemical energy store	Emptied during chemical reactions when energy is transferred to the surroundings
Dissipation	Become spread out wastefully
Elastic energy store	Filled when a material is stretched or compressed
Energy	Energy is needed to make things happen
Gravitational potential energy store	Filled when an object is raised
Heat	The total amount of thermal energy stored in a system. Measured in Joules
Joule	The unit of energy. Symbol - J
Kinetic energy store	Filled when an object speeds up
Law of conservation of energy	Energy cannot be created or destroyed, only transferred between stores
Temperature	The average kinetic energy of the particles in a system. Measured in in °C
Thermal energy store	Filled when an object is warmed up
Thermometer	Instrument used to measure temperature

Particles Recap



Energy Transfers

Energy can be transferred from one store to another by an electrical current or by sound or light waves.

E.g. When you switch on a torch, energy is transferred from the chemical store of the battery to the thermal store of the bulb by an electrical current



This can be shown as an energy transfer diagram:

Chemical → Electrical → Light (+ Thermal)

Heat

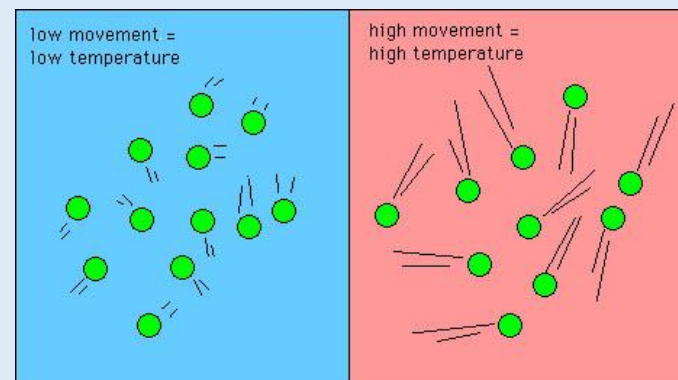
Heat is a measure of the **total energy** in a system (due to the movement of particles **and** the mass)

Heat is measured in Joules

Temperature

Temperature is a measure of the **average energy** of the particles in a system (due to how quickly they are moving)

Temperature is measured in degrees Celsius, Fahrenheit or Kelvin



Year 8 Energy

Key vocabulary

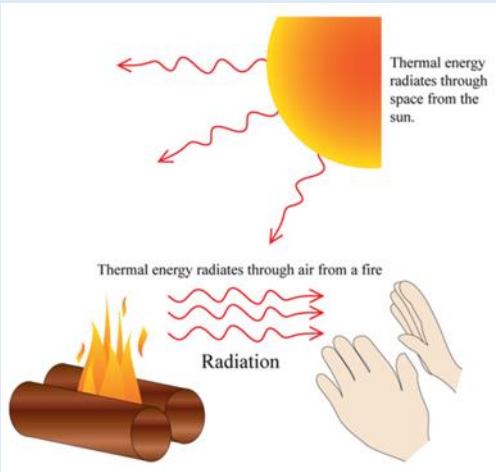
Conduction	Transfer of thermal energy by the vibration of particles
Convection	Transfer of thermal energy when particles in a heated fluid rise
Convection current	The movement of heated fluids where hot fluid moves upwards, and cold fluid moves downward
Fluid	A substance with no fixed shape. A gas or liquid.
Infrared radiation	Radiation given off by the Sun and other objects that brings about energy transfer
Insulation	Ways to reduce energy transfer
Radiation	The transfer of energy as a wave
Thermal Conductor	Material that allows heat to move quickly through it
Thermal insulator	Material that only allows heat to travel slowly through it

Radiation

Light and heat from the Sun reach the Earth by radiation. It can travel through the vacuum of space (no particles).

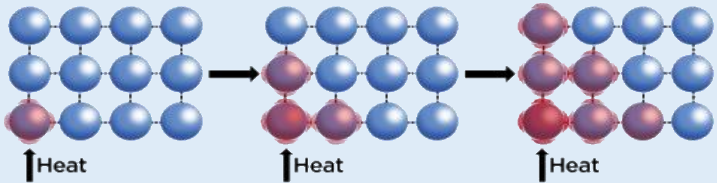
All objects emit (give out) radiation. The amount of radiation they emit depends on their temperature.

Thermal imaging cameras can be used to see the infrared radiation that objects emit.



Conduction

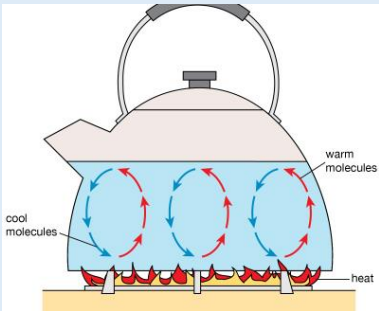
Solids transfer heat by conduction. When you heat an object the particles vibrate faster. In conduction, particles transfer heat energy by colliding with each other as they vibrate.



Convection

When you heat a fluid (gas or liquid) this is what happens:

- The fluid that is close to the heat source gets hotter, so the particles move faster
- These particles move further apart so the fluid becomes less dense
- The hotter, less dense fluid rises to the top and the cooler, denser fluid takes its place at the bottom



Insulators

Insulation slows down the transfer of heat energy

Type of heat transfer	How to slow down transfer	Example
Conduction	Use a good thermal insulator	Using a plastic handle on a saucepan
Convection	Trap fluid particles so they can't move away	Keeping lid on saucepan
Radiation	Use shiny surfaces to reflect radiation	Using a shiny foil blanket to keep warm

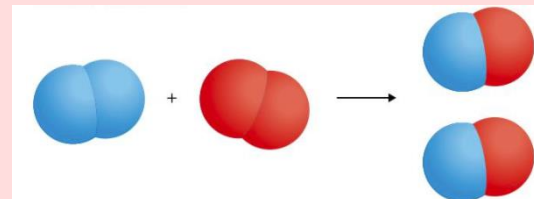
Year 8 Reactions

Key vocabulary

Atom	The smallest part of an element that can exist
Balanced symbol equation	Chemical formulae represent the reactants and products. Shows how atoms are rearranged and gives the relative amounts of reactants and products
Carbonate	Compound that includes carbon and oxygen atoms and a metal element. It has 3 oxygen atoms for each carbon
Chemical bond	Force that holds atoms together in molecules
Chemical formula	A formula that shows the elements present in a compound and their relative proportions
Chemical reaction	A change in which a new substance is formed. In a chemical reaction atoms are rearranged
Chemical symbol	A one or two letter code for an element that is used by scientists in all countries
Combustion	A chemical reaction in which a substance reacts quickly with oxygen and gives out heat and light.
Conservation of mass	In a chemical reaction the total mass of reactants is equal to the total mass of products
Decomposition	A chemical reaction in which a compound breaks down to form more than one product
Fuel	A substance that stored energy in a chemical store which it can release as heat
Nitrate	Compound that includes nitrogen and oxygen as well as a metal element. It has 3 oxygen atoms for each nitrogen.
Products	Substances that are formed in a chemical reaction
Reactants	Substances that react together in a chemical reaction
Thermal decomposition	A chemical reaction in which a compound breaks down on heating to form more than one product

Atoms in a chemical reaction

In a chemical reaction atoms are rearranged to form new substances
There are the same number of each type of atom in the products and reactants, leading to conservation of mass.



Word Equations

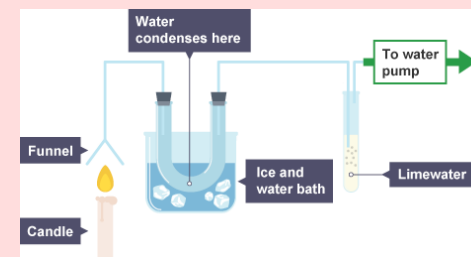
Reactions can be represented using word equations

Products $\longrightarrow$ Reactants

The arrow in a word equation means "becomes"

Combustion

Chemical reactions where a fuel reacts with oxygen to produce carbon dioxide and water.
These reactions are also called burning.



Fuel + Oxygen $\rightarrow$ Carbon dioxide + water

You can test for the presence of carbon dioxide using limewater, which turns cloudy when carbon dioxide is bubbled through it

Thermal decomposition

Chemical reactions where a compound breaks down when it is heated.

Metal carbonate $\rightarrow$ metal oxide + carbon dioxide

Year 8 Reactions

Key vocabulary

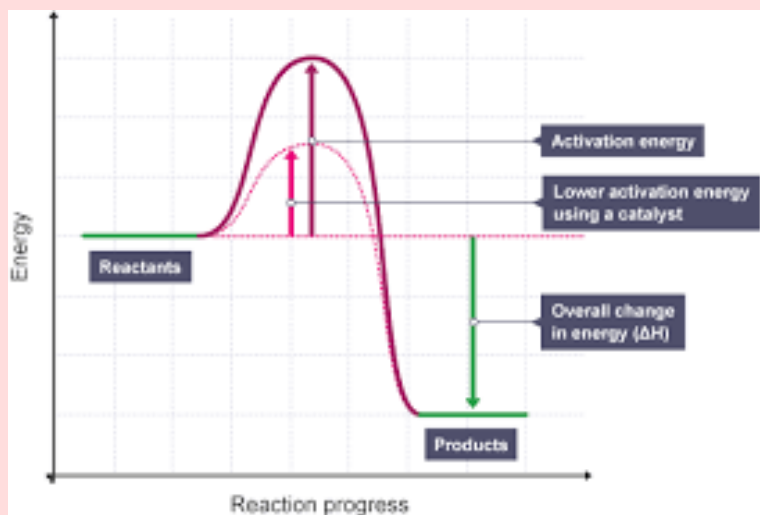
Catalyst	Substances that speed up chemical reactions but are unchanged at the end
Catalytic converter	A part of a car between the engine and the exhaust that converts harmful substances into less harmful ones
Endothermic reaction	A reaction that takes in energy, usually a heat. In other words, it transfers energy from the surroundings
Energy level diagrams	Diagram showing the relative energies of the reactants and products.
Exothermic reaction	A reaction that gives out energy, usually as heat. In other words, it transfers energy to the surroundings

Catalysts

Sometimes reactions need an input of energy to get them started. This is called the activation energy.

Catalysts can lower this activation energy and make the reaction happen faster.

Catalysts are not used up in the reaction and remain unchanged at the end of the reaction



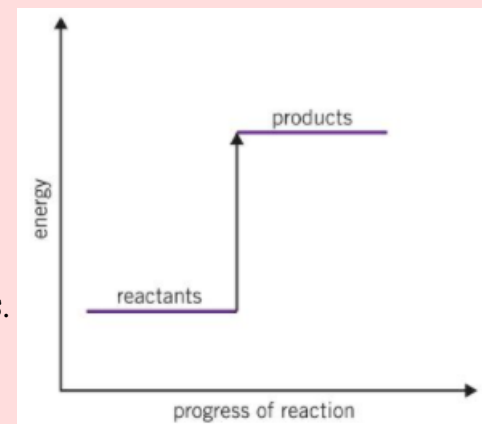
Endothermic reactions

Some reactions take in energy from the surroundings. These reactions are called endothermic reactions.

The energy level of the products are higher than those of the reactants, as shown in the energy level diagram.

In endothermic reactions the temperature decreases.

Thermal decomposition reactions are endothermic reactions.



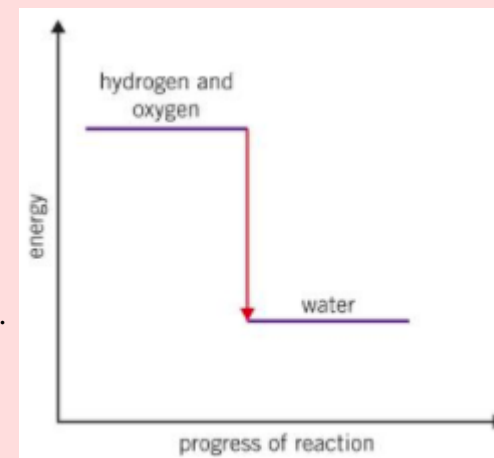
Exothermic reactions

Some reactions release energy to the surroundings. These reactions are called exothermic reactions.

The energy level of the reactants are higher than those of the products, as shown in the energy level diagram.

In exothermic reactions the temperature increases.

Combustion reactions are exothermic reactions.



Year 8 Ecosystems

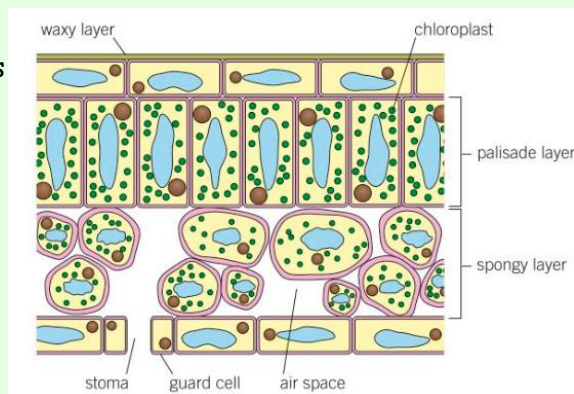
Key vocabulary

Algae	Green uni-cellular or multi-cellular organisms that perform photosynthesis and live underwater
Chlorophyll	Green pigment in plants and algae which absorbs light energy
Chloroplast	Part of a plant cell that contains chlorophyll and is the site of photosynthesis
Glucose	A type of sugar
Guard Cells	Cells which control the size of the stomata
Iodine	Indicator that is used to test for the presence of starch
Palisade layer	Layer of a leaf where photosynthesis occurs. Contains cells packed with chloroplasts
Photosynthesis	The process plants and algae use to make their own food, glucose. In photosynthesis carbon dioxide and water react together to make glucose and oxygen
Producer	Organism that makes its own food using photosynthesis
Stomata	Pores in the bottom of a leaf which open and close to let gases in and out
Xylem	Tubes which transport water in a plant

Leaf structure

Leaves are adapted for photosynthesis because they:

- Are green because they of chlorophyll
- Are thin to allow gases to diffuse in and out easily
- Have a large surface area to absorb light
- Have veins to transport water and glucose



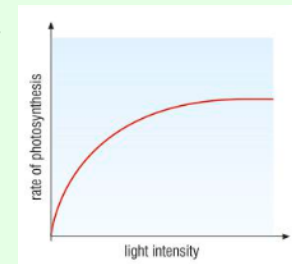
Photosynthesis reaction



Factors affecting photosynthesis

The rate of photosynthesis is affected by:

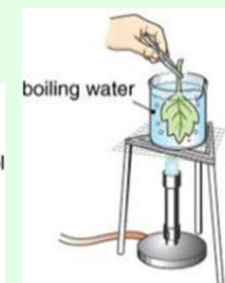
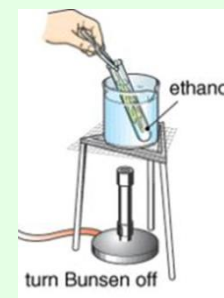
- Light intensity
- Carbon dioxide concentration
- Temperature



Testing a leaf for starch

The glucose produced in photosynthesis is stored in a plant as starch

1. Boil a leaf in water for 5 minutes
2. Heat the leaf in ethanol
3. Rinse the leaf in water and spread onto a white tile
4. Add 2-3 drops of iodine



If the plant has been photosynthesising, starch will be present and the iodine will turn a blue/black colour

If the plant has not been photosynthesising, starch will not be present and the iodine will remain orange



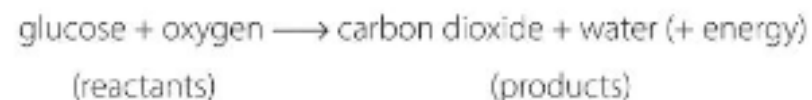
Year 8 Ecosystems

Key vocabulary

Aerobic	Involves oxygen
Aerobic Respiration	Breaking down glucose with oxygen to release energy and producing carbon dioxide and water
Anaerobic	Does not involve oxygen
Anaerobic respiration	Releasing energy from the breakdown of glucose without oxygen, producing lactic acid (in animals) and ethanol and carbon dioxide (in plants and microorganisms)
Fermentation	A type of anaerobic reaction in which glucose is converted into ethanol, carbon dioxide and energy
Glucose	A type of sugar
Haemoglobin	The substance in blood that carries oxygen
Lactic Acid	A toxic chemical produced during anaerobic respiration.
Mitochondria	Structures in the cytoplasm of all cells where aerobic respiration takes place (singular is mitochondrion).
Oxygen Debt	Extra oxygen required after anaerobic respiration to break down lactic acid
Plasma	Liquid that transports blood cells and other materials, such as glucose and carbon dioxide, around the body
Respiration	The process that transfers energy in plants and animals. In respiration, glucose reacts with oxygen to make carbon dioxide and water
Respiratory System	The organ system where air is taken into and out of the body, and gas exchange happens.

Aerobic respiration

Word equation

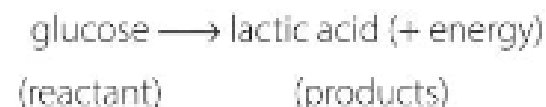


Respiration and exercise

- During exercise the muscles need more energy
- This is supplied by respiration
- Respiration requires glucose and oxygen
- Oxygen enters the body through breathing
- Breathing rate increases to supply this additional oxygen need

Anaerobic respiration

Anaerobic respiration in animals



Anaerobic respiration in plants

