Science: Year 7: Autumn Term 1: Scientific Enquiry Energy Pure + Impure substances

ST TERESA of CALCUTTA Catholic Academy Trust

Glossary:

Prediction: what you think will happen.

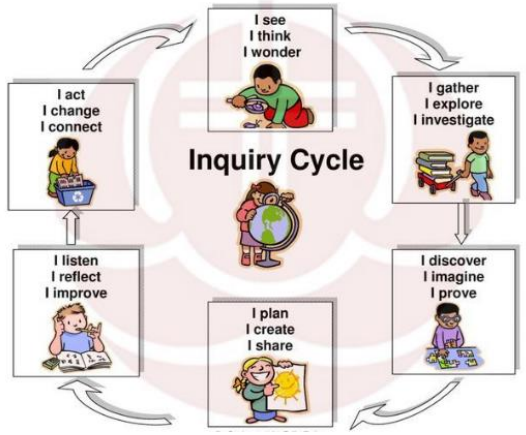
Hypothesis: an idea or a theory that hasn't been tested

Analyse: examine methodically and in detail

Variable: a factor that can vary or change

After a **scientific method** has been followed through, data is **analysed** to see if it matches the **prediction** and check if the **hypothesis** seems correct.

Once data has been collected, displaying it in a chart or a graph helps to spot patterns. The pattern, if there is one, will show how the **independent variable** has affected the **dependent variable**.



Key points

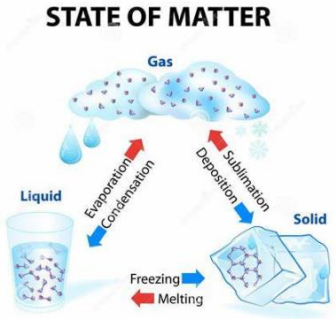
- A conclusion sums up what has been found out during an investigation.
- A conclusion should be clearly structured and explained using scientific knowledge.
- At the end of an investigation, evaluate the results and method to judge how reliable the conclusion is.

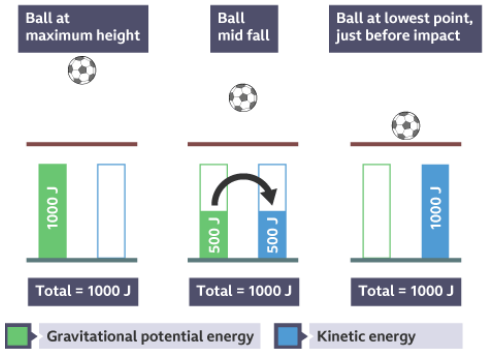
Glossary:

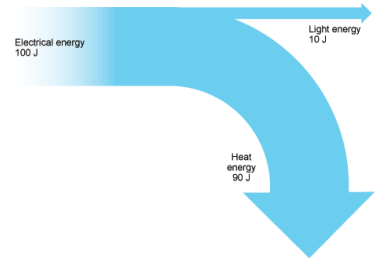
Energy store: different ways that energy can be found in a system

Conserved: maintain (a quantity such as energy) at a constant overall total

Energy pathway: How energy is transferred from one pathway to another







- The SI unit of energy is the **joule (J)**

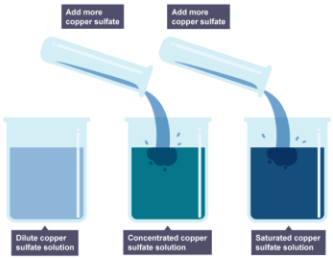
Key points

- **Energy** can be described as being in different 'stores'.
- Energy can be transferred from one store to another.

There are several stores of **energy**.

Energy can be transferred by:

- mechanical working – when a force is applied to move an object through a distance
- electrical working – when charge flows (electricity)
- heating – when energy is transferred between hotter and colder regions
- radiation – when energy is transferred as a wave, for example as light or sound



Key points

- Most materials that we use are **mixtures**, and just a few are pure elements or pure compounds.
- In chemistry, a pure substance is a single substance made of only one type of particle.
- **Impurities** change the temperature at which a **substance** melts and boils.

In sea water, the water is the solvent and salt is the solute

Glossary:

Matter: Can be one of three states: gas, liquid or solid

Dissolve: Where a solute breaks up into smaller pieces when placed in a solvent

Pure: A pure substance is not mixed with anything else

Impure: A material with more than one substance in it is impure

Science: Year 7 Autumn Term 2: Forces and Magnetism, Microscopes and Cells

Key Words:

Contact Forces.
Contact forces act between objects that are physically touching each other.

Friction.
The force between two surfaces that are sliding, or trying to slide, past each other.

Air Resistance.
The force that acts in the opposite direction to an object's movement as it moves through the air.

Reaction.
The force that supports an object on a solid surface.

Upthrust.
The upward force exerted by a fluid on an object floating in it.

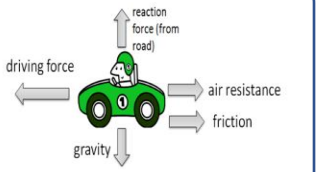
Non-Contact Forces.
Non-contact forces act between objects without them physically touching each other.

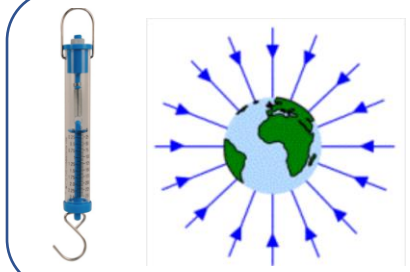
Gravitational Force.
The force acting on an object due to gravity.

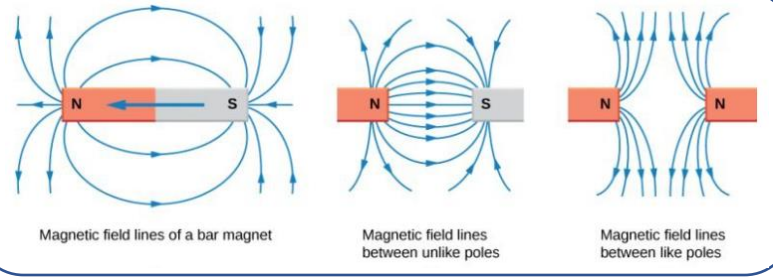
Magnetic Force.
The force exerted by a magnetic field on a magnetic material.

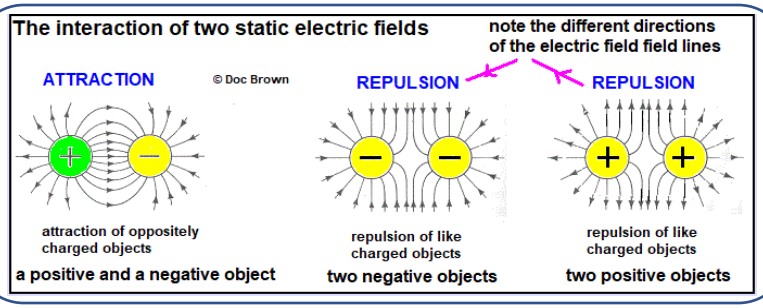
Electrostatic Force.
The force that acts between two charged objects.

Newtons.
The units of force.









1. An object at rest (or moving at constant speed) will continue to do so, unless acted upon by an external force.

2. The acceleration of an object is governed by two factors. Its mass and the force acting on it.

3. Every action has an equal and opposite re-action.

Key Words:

Microscope.
A piece of equipment that allows us to see microscopic objects like cells.

Cell.
The smallest building blocks of life.

Cell Membrane.
The bag that holds the cell together.

Cytoplasm.
A jelly like substance found inside cells, most of the reactions happen here.

Nucleus.
Contains the DNA and controls the cell activity.

Mitochondria.
Respiration happens here to provide energy for the cell.

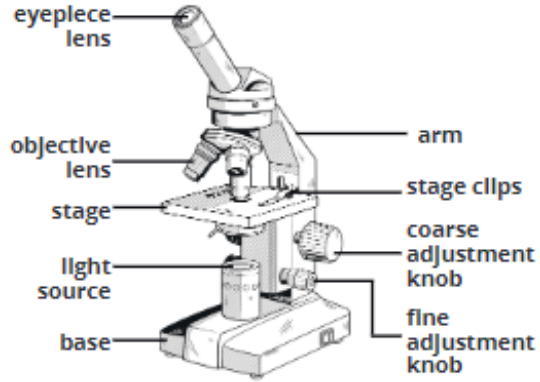
Ribosome.
These synthesise proteins.

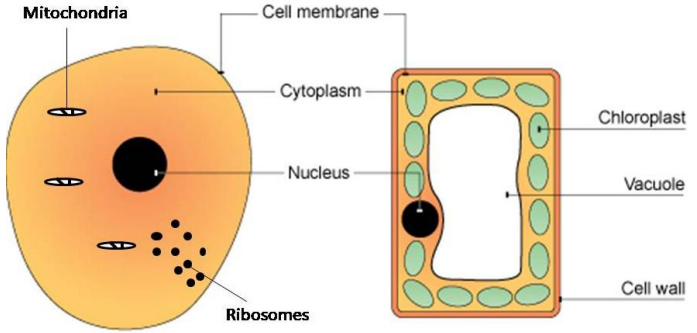
Extra parts found in plants:

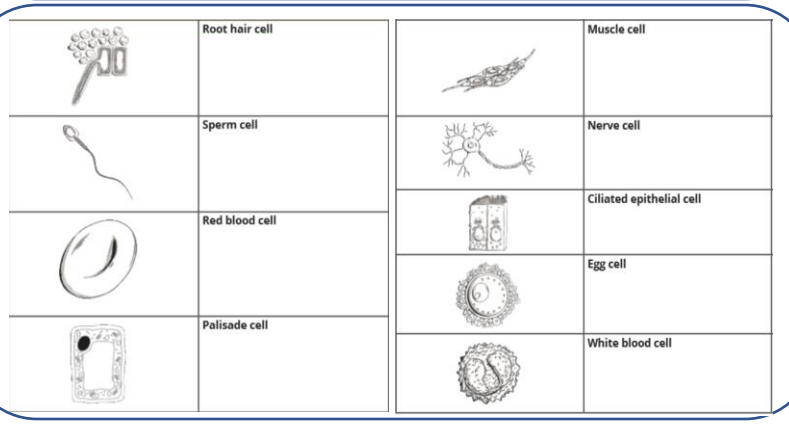
Cell Wall.
Provides support for the plant cell.

Vacuole.
Contains the cell sap.

Chloroplasts.
They contain a green pigment called chlorophyll. This is where photosynthesis happens.







Year 7 Spring term 2: Elements, mixtures & compounds

GLOSSARY

Atoms

The smallest part of an element that can take part in chemical reactions.

Element

An element contains only one type of atom. Found on the Periodic Table.

Compound

Two or more elements chemically bonded with each other.

Mixture

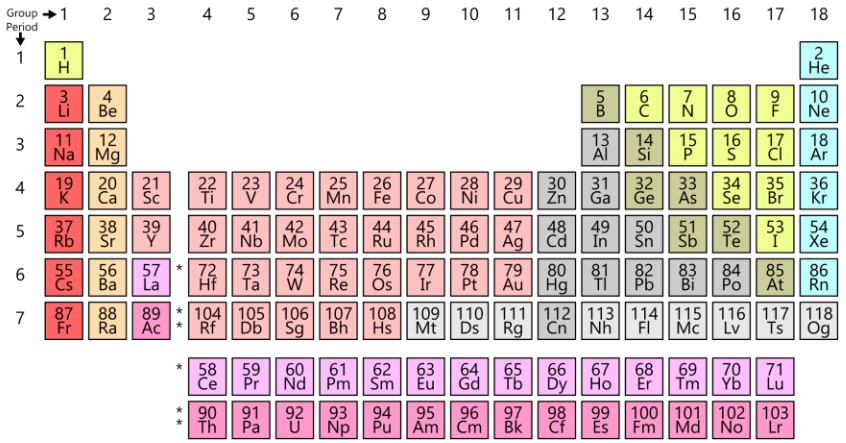
Contains two or more elements or compounds not chemically bonded. Can be separated using physical methods e.g. by filtration.

Periodic Table

A table that contains all of the known chemical elements.

Formulae

Shows the type and number of atoms in a compound and the relative proportions of elements.



Key ideas: Atoms & Elements

Atoms are the smallest part of an element that can take part in chemical reactions. They have no overall electrical charge and are very small.

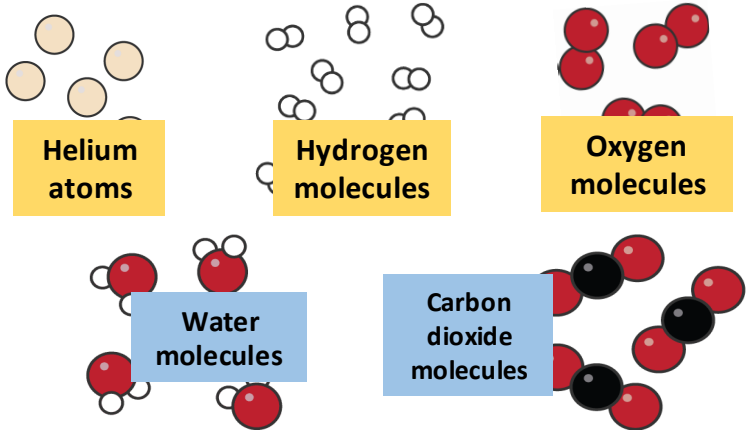
All elements are found on the periodic table. Each element is made of only one type of atom and has a unique symbol e.g. O for oxygen and Fe for iron.

Key ideas: Compounds, molecules & mixtures

Atoms can exist on their own e.g. Helium atoms and joined together in molecules e.g. hydrogen H_2, oxygen O_2 and or compounds like carbon dioxide CO_2.

A compound is made of different elements joined together by chemical bonds e.g. carbon dioxide and water.

Mixtures are made of different substances, elements or compounds, mixed together but not chemically combined. Mixtures can be separated e.g. by filtering or distillation.



This formula for water tells us: H_2O

2 x H atoms 1 x O atom

This formula for calcium nitrate tells us: $Ca(NO_3)_2$

1 x Ca atom 2 x N atoms 6 x O atoms

Year 7 Summer Term 1: Acids and alkalis, Electricity

Glossary

Acid – a solution with a pH less than 7.

Alkali – a solution with a pH of more than 7.

Indicator – changes colour depending on whether it is an acid or an alkali e.g. universal indicator.

Salt – chemicals formed by neutralisation reactions.

Neutralisation – the process of making a solution neutral.

pH – measures how acidic or alkaline a substance is.

Current – the flow of electrical charge, measured in amps (A), using an ammeter.

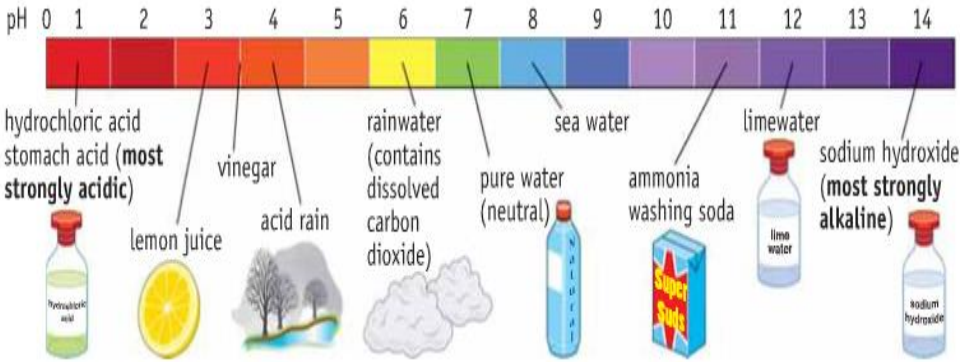
Voltage – measure of electrical energy, measured in volts (V), using a voltmeter.

Series circuit – components joined in a single loop.

Parallel circuit – circuit in which there are 2 or more paths for an electric current.

Static – unbalanced electric charges on or within a material.

Resistance – measure of how difficult it is for current to flow around a circuit, measured in ohms.



Neutralisation reaction

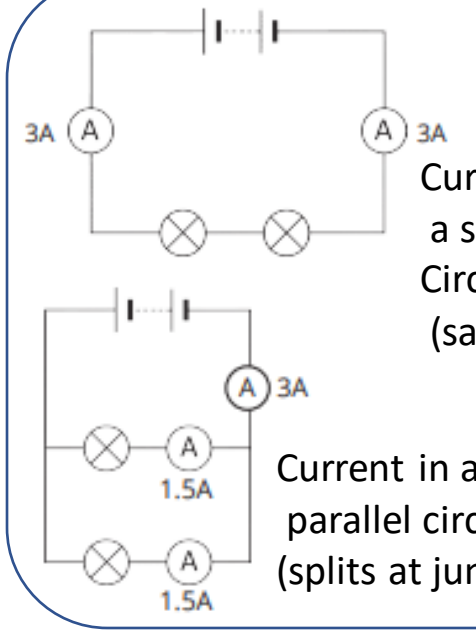
acid + alkali → salt + water

e.g.

hydrochloric + sodium → sodium + water
acid hydroxide chloride

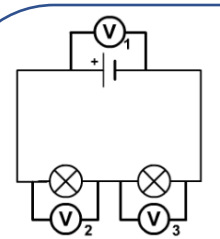
Hydrochloric acid(HCl) makes salts with the second name CHLORIDE.
Sulphuric acid(H_2SO_4) makes salts with the second name SULPHATE.
Nitric Acid(HNO_3)makes salts with the second name NITRATE.

cell	
battery	
ammeter	
voltmeter	
motor	
bulb	
Open switch	
Closed Switch	
Resistor	
Variable resistor	



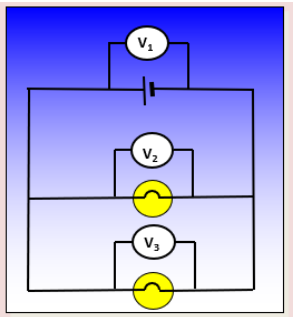
Current in a series Circuit (same)

Current in a parallel circuit (splits at junction)



	voltage
1	3.0
2	1.5
3	1.5

Voltage in a series circuit (splits)



Voltmeter	Voltage (V)
V_1	1.5
V_2	1.5
V_3	1.5

Voltage in a parallel circuit (same)

Year 7 Summer Term 2: Body systems and Plant life

Body systems glossary

Organelle – a structure in a cell that has a specific function.

Cell – the building blocks of life.

Tissue – a group of similar cells working together.

Organ – a group of similar tissues working together.

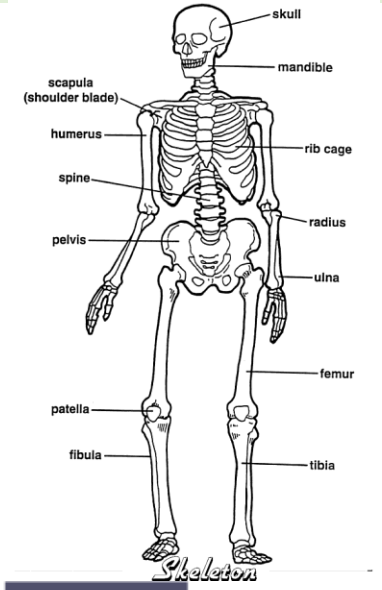
Organ system – a group of organs working together.

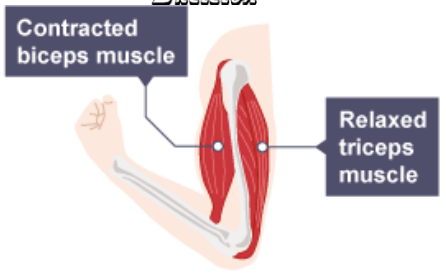
Organism – an individual plant/animal or single celled life form such as bacteria.

Respiration – A chemical reaction that releases energy.

Breathing – A muscular contraction drawing air into and out of the lungs.

Joint – where two bones meet.





Plant life glossary

Photosynthesis – A process where plants absorb light, carbon dioxide and water to make their own food (glucose) and oxygen.

Absorption – the taking in of materials.

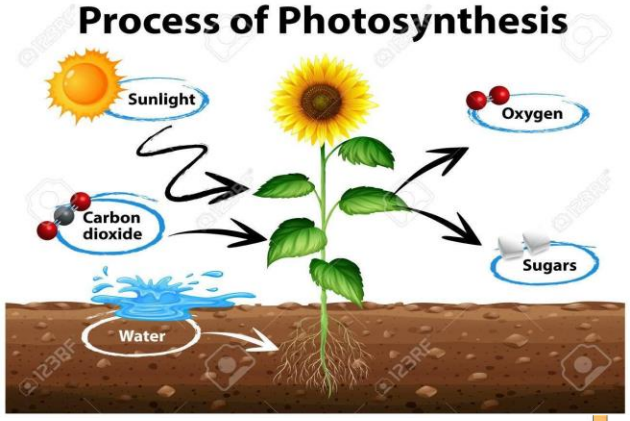
Chloroplasts – where light is absorbed in the plant.

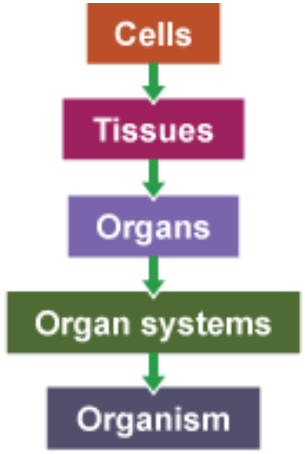
Palisade cells – contain main chloroplasts where light is absorbed.

Root hair cells – where water and minerals are absorbed.

Key points…

- The leaf is one of the most important organs of a plant.
- Leaves produce food for the plant through a process called photosynthesis.
- The leaves of different plants vary widely in size, shape and colour and are adapted to carry out photosynthesis.
- Water is absorbed in a plant through the roots by cells called root hair cells.
- Root hair cells have a large surface area to absorb as much water and minerals as possible.





Organ system	Main organs	Function
Circulatory	Heart, veins, arteries	Transports substances in the blood around the body
Respiratory	Lungs	Takes in oxygen, removes carbon dioxide
Digestive	Stomach and intestines	Breaks down food, absorbs nutrients
Reproductive	Uterus, vagina. Penis, testes	Creates offspring