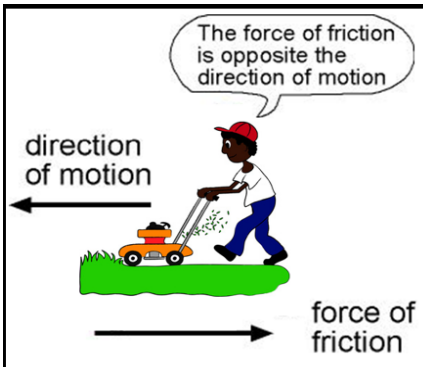
SCIENCE SUMMER 1 KNOWLEDGE ORGANISERS

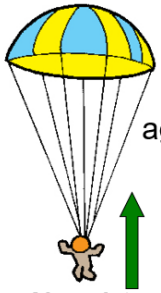
Y5 SCIENCE KNOWLEDGE ORGANISER
TOPIC: Unit 4 [SPRING / SUMMER]



Friction is the force that pushes against objects as they move along a surface to slow you down

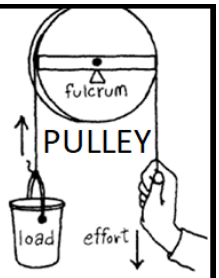
Rougher surfaces have more friction

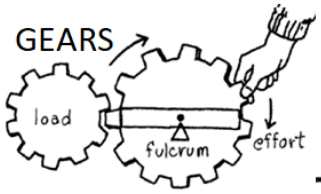
More friction means more grip

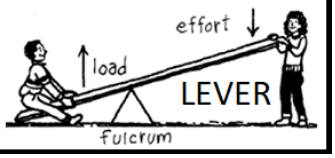


Air resistance and Water resistance are special types of friction where air or water push against objects to slow them down They are also known as drag.

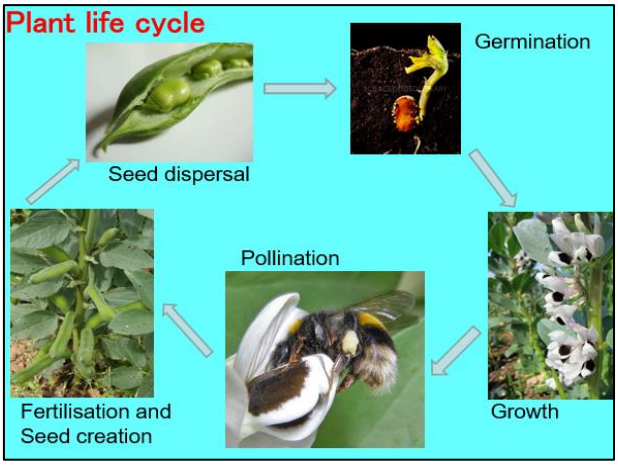
Levers, Gears and Pulleys are simple machines that turn a small force at a distance into a greater force around a pivot point.





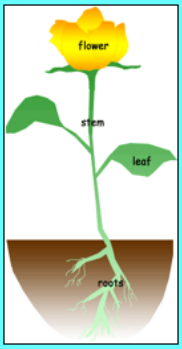


Plant life cycle



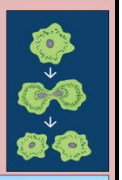
What do plants need to be healthy?

- **LIGHT – to make food**
- **AIR – to make food**
- **WATER – to make food**
- **WARMTH – to grow well**
- **NUTRIENTS – to stay healthy**



Asexual Reproduction

- This means reproducing without two parents [pollen / sperm joining to ovule to make a seed]
- It makes an exact copy from part of the plant, part of an animal or micro-organism.



Flower Parts

The **stigma** is sticky to keep hold of the pollen.

The **petals** attract insects.

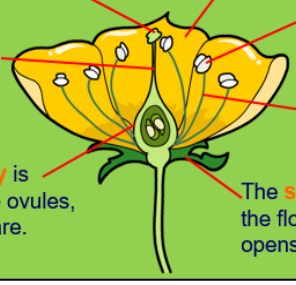
The **anther** is the part that makes the pollen.

The **style** supports the stigma and connects it to the ovary.

The **filament** holds up the anther.

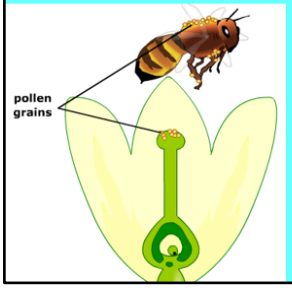
The **ovary** is where the ovules, or eggs, are.

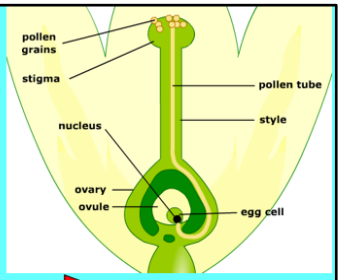
The **sepal** leaves protect the flower before it opens.



Pollination

This is transfer of pollen form one plant to another





Fertilisation

This is joining of an egg cell and pollen grain to form a seed

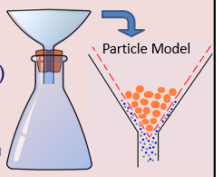
The ovary turns into the fruit

Y6 SCIENCE KNOWLEDGE ORGANISER
TOPIC: Unit 4 [Spring]

How are solids separated out of mixtures?

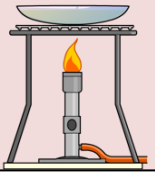
Separating an insoluble solid and a liquid:

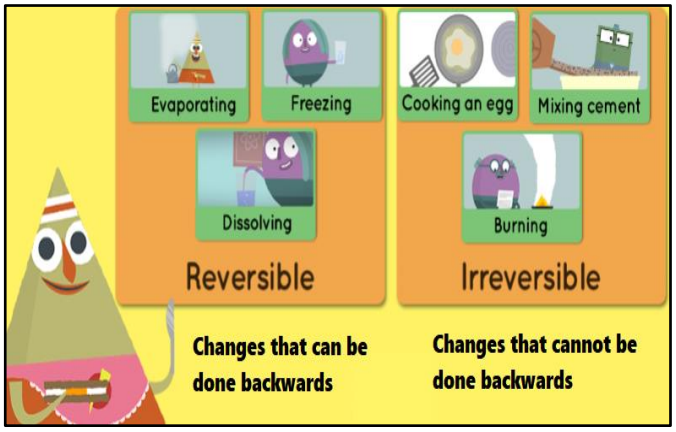
- If a solid is insoluble (e.g. sand in water) then it is easy to separate it by **filtering** the mixture.
- The insoluble solid cannot pass through the filter paper but the water can.



Separating a soluble solid and a liquid:

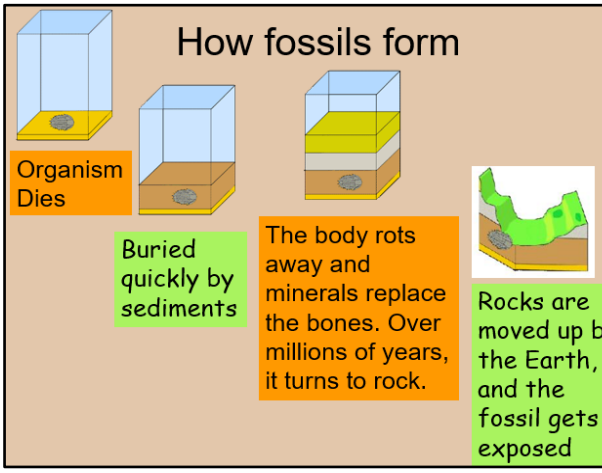
- To separate a soluble solid from a liquid (e.g. salt and water), **evaporation** can be used.
- The solution is heated so that the water evaporates and leaves the dissolved solid behind.





Key Vocabulary	Definition
Inherit	Receive information from the previous generation. In most animals, this information is passed on in the egg from the mother and the sperm from the father.
Variation	The differences between living things
Fossil	An imprint of a living thing from millions of years found in rock. A living thing dies, gets buried by many layers of sediment, and eventually the hard parts [bones etc.] turn into minerals
Charles Darwin	Famous scientist who came up with the theory of Evolution. He first described the process of Natural Selection.
Reversible Change	A change to a material that can be done backwards. All changes of state [like melting and condensing] are reversible. Dissolving and mixing are also reversible.
Irreversible Change	A change to a material that cannot be done backwards. They always make a brand new material. Burning, cooking and making plaster are good examples.
Mixture	Materials that are jumbled up together but can be separated.
Separation	The way that mixtures can be split up into the parts that make them up. Examples include sieving, filtering, magnetism and evaporation.

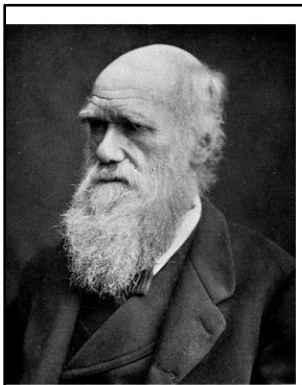
How fossils form



Scientists can use fossils to learn lots about the living things that lived in the past.

We call the information gained from fossils the Fossil Record.

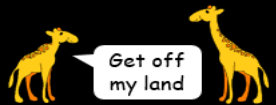
Not all living things fossilise well, and there will be many fossils that have been destroyed by the movements of the Earth, or simply not yet been discovered. This means we have gaps in the Fossil Record.



The modern ideas on evolution were created by Charles Darwin in his 1859 book 'The Origin of Species'.

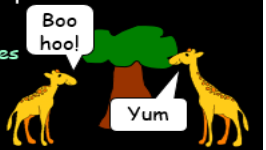
Evolution

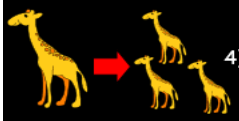
1) Animals of the same types are similar but have differences [variations]. Some are helpful.



2) There is competition within each species for food, living space, water, mates etc., and the risk from predators and disease

3) The "better adapted" members of these species are more likely to survive – this is called "Survival of the Fittest" or Natural selection





4) These survivors will pass on their better genes to their offspring who will also show this beneficial variation. This continues for many generations.

5) Over millions of years, animals change for the better. This is evolution!

Y7 SCIENCE KNOWLEDGE ORGANISER
UNIT 4 [Spring / Summer]

Types Of Change

- Reversible
- Irreversible
- Temporary
- Permanent
- Physical change - No new material [same particles]
- Chemical Reaction – New material [particles rearranged]

How can we show reactions?

Word Equation:

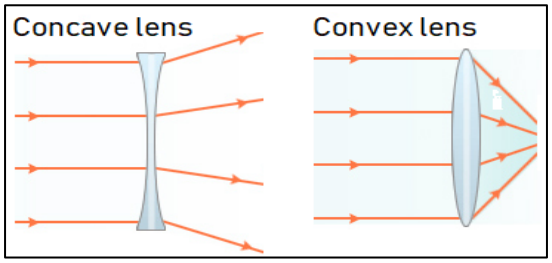
Iron + Sulphur → Iron Sulphide

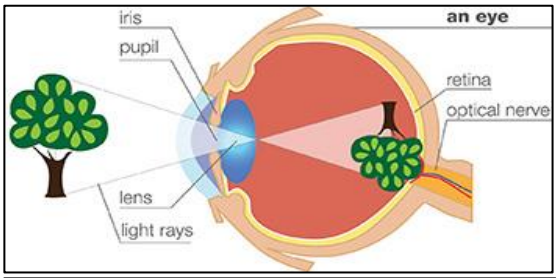
[Reactants] [Products]

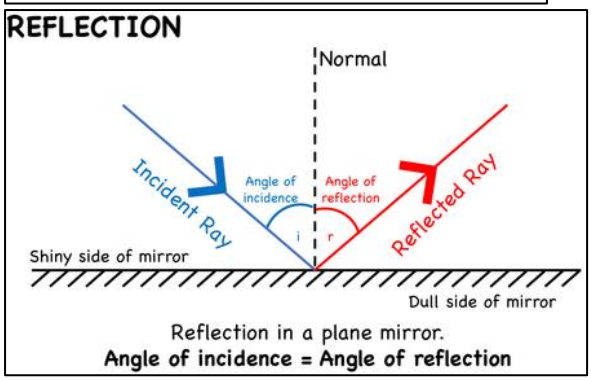
Symbol Equation:

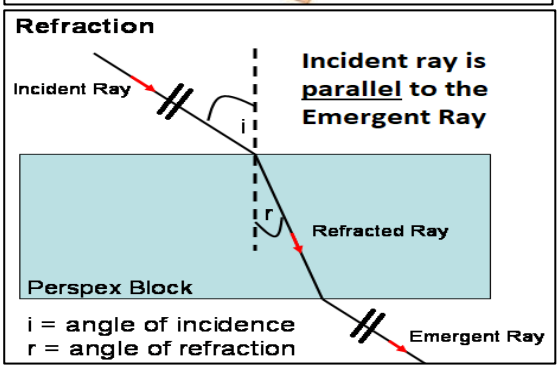
Fe + S → FeS

- FeS is the **Chemical Formula** for Iron Sulphide



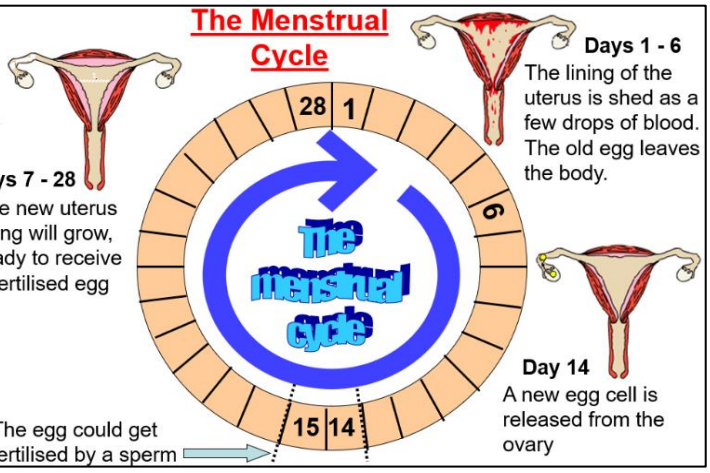






Key Vocabulary	Definition
Chemical Reaction	An irreversible change where particles change order and combination. A physical change does not change the order and combination of atoms, and can usually be easily reversed. Mass is not lost or gained in reactions.
Oxidation	The chemical reaction where oxygen combines with another element to form an oxide. Rusting is an example.
Reflection	When light off an object. The angle of incidence is always the same as the angle of incidence.
Refraction	The change in direction of light as it travels into a new transparent material, such as glass or water.
Scatter	When light reflects off an uneven surface in many directions
Normal	The line draw at 90° to the reflecting surface
Contraception	Methods used to prevent egg and sperm from joining. Some are physical like a condom, and some are chemical, like the contraceptive pill
IVF	In-vitro Fertilisation – where fertilisation is performed outside of the body using removed eggs and sperm.
Contractions	Muscular movements from the uterus which push the baby out when it is being born
Asexual Reproduction	Reproduction by a single parent to produce clones [identical copies]. Occurs very rapidly in microbes, but also in some plants and animals. As the clones are identical, a single disease can often wipe out a population.

The Menstrual Cycle



Pregnancy

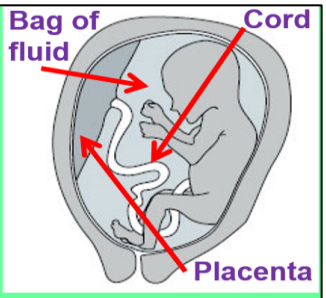
An embryo forms a structure called the **placenta**, which attaches to the uterus wall.

The **umbilical cord** joins the foetus [developing baby] to the placenta.

In the placenta, food and oxygen diffuse from the mother's blood into the blood of the foetus.

Carbon dioxide and waste products diffuse from the blood of the foetus into the mother's blood.

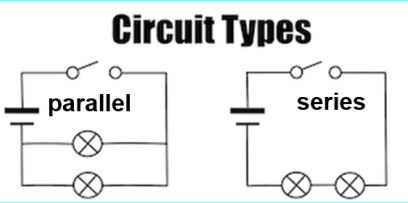
The foetus is protected inside the uterus by a **bag of spongy liquid [amnion]**



A mother has to be careful about what she takes into her body. **Alcohol and other drugs** can pass through the placenta and damage the foetus.

Y8 SCIENCE KNOWLEDGE ORGANISER
Unit 4 [Spring / Summer]

How do series circuits differ from parallel circuits?



	Does it have extra branches?	Brightness: If we add more bulbs…	If one bulb breaks…
Series	NO	All go DIMMER (In Series)	All go OUT
Parallel	YES	All stay BRIGHT (In Parallel)	The rest stay ON

Circuit Summary

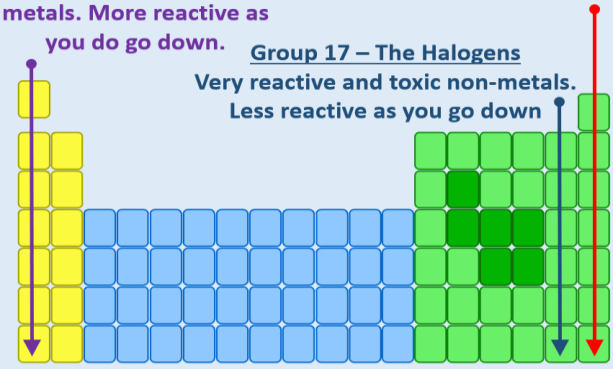
	Current [A]	Voltage [V]
Series Circuit	Same at all points	Shared by outputs
Parallel Circuit	Shared between branches	Same down each branch

Patterns in the periodic table

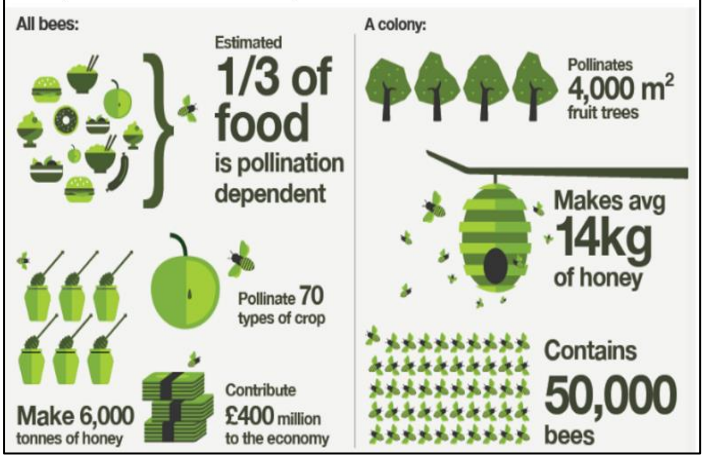
Group 1 – The Alkali Metals
All very soft and reactive metals. More reactive as you do go down.

Group 18 – The Noble Gases
All very unreactive gases

Group 17 – The Halogens
Very reactive and toxic non-metals. Less reactive as you go down

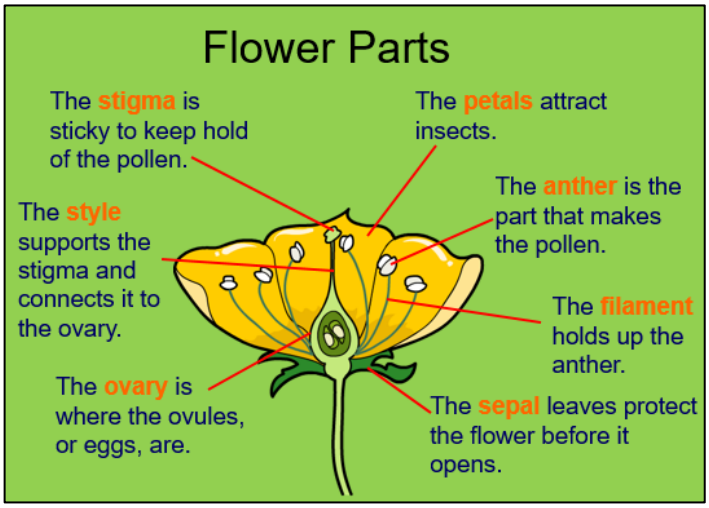


Why are bees so important?



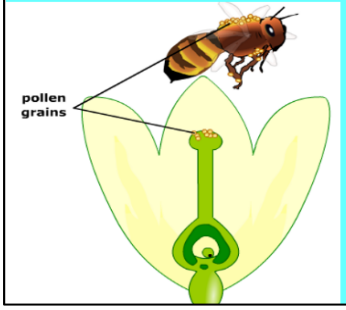
Key Vocabulary	Definition
Resistance	The electrical resistance of an object is a measure of its opposition to the flow of electric current. It can be calculated by dividing voltage by current, measured in Ohms [Ω].
Reactivity Series	The list of metal in terms of their relative reactivity. Potassium is the most reactive common metal, whereas gold is the least reactive common metal.
Displacement Reaction	A chemical reaction where a more reaction metal takes the place of a less reactive metal in a compound. Train tracks are welded together by reacting Aluminium with Iron Oxide in the Thermite Reaction. Aluminium displaces the iron and takes the Oxide. The left-over iron welds the train tracks together.
Smelting	A process where carbon [coal] is used to remove less reactive metals from rocks [called ores]. This is how iron was first removed from red rock. The carbon reacts with the other chemical in the ore, to leave the metal behind, which can be shaped in useful tools.
Seed Dispersal	The methods that plants use to spread their seeds to increase the chance of the seed finding suitable ground to grow away from the parent plant. These include using wind, water, animals and explosion.

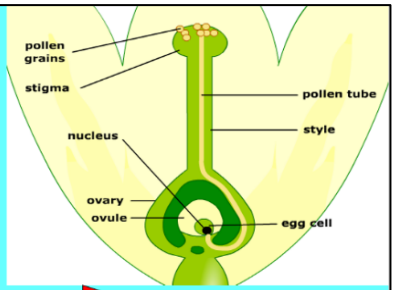
Flower Parts



Pollination

This is the transfer of pollen form one plant to another, by wind or insects





Fertilisation

This is joining of the nucleus of an egg cell and pollen grain to form a seed

The ovary turns into the fruit