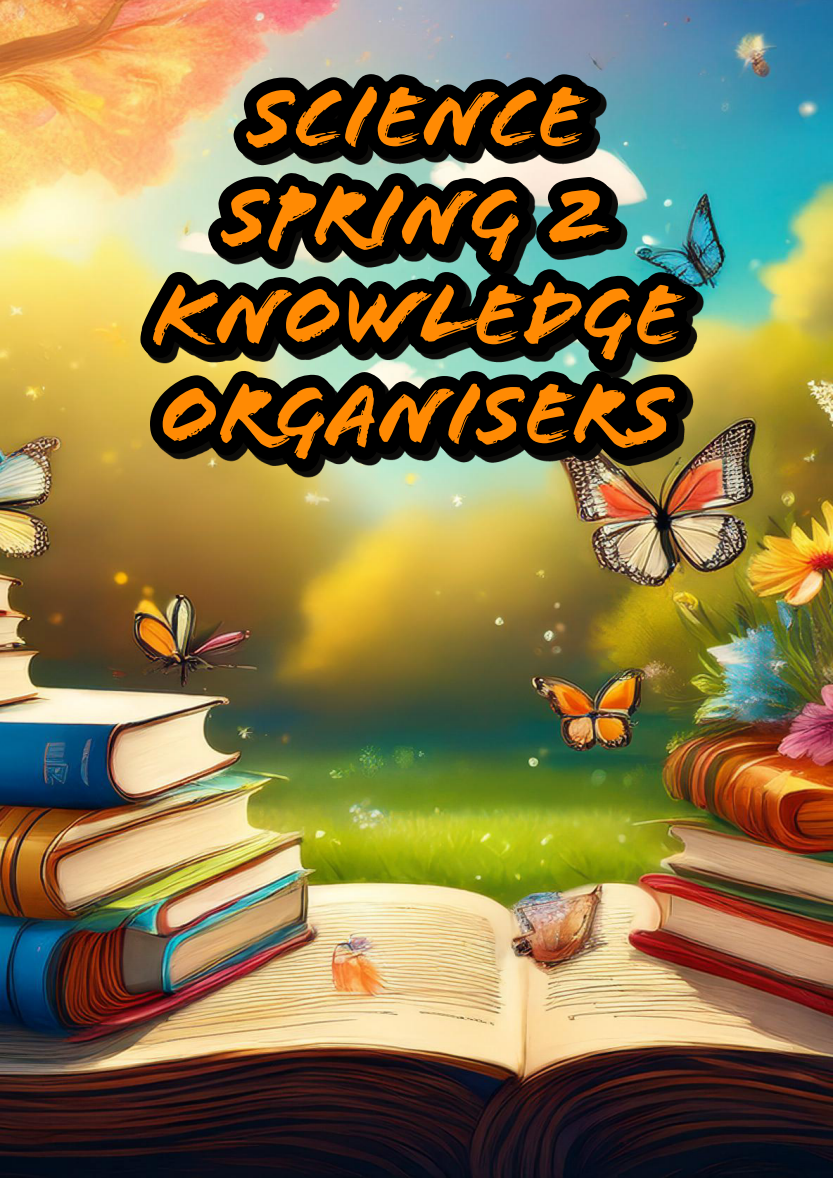


SCIENCE SPRING 2 KNOWLEDGE ORGANISERS



Y5 SCIENCE KNOWLEDGE ORGANISER

TOPIC: Unit 4 [SPRING / SUMMER]



The force of friction is opposite the direction of motion

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

More friction means more grip

Rougher surfaces have more friction

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**.

Air resistance

Water resistance

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

PULLEY

GEARS

LEVER

Plant life cycle

Seed dispersal → Germination → Growth → Pollination → Fertilisation and Seed creation

Seeds need water and warmth to germinate. They don't need light.

The roots always grow first to find water.

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

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 **filament** holds up the anther.
- The **sepal** leaves protect the flower before it opens.
- The **ovary** is where the ovules, or eggs, are.
- The **style** supports the stigma and connects it to the ovary.

Pollination

This is transfer of pollen from 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

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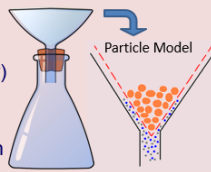
TOPIC: Unit 4 [Spring]



How are solids separated out of mixtures?

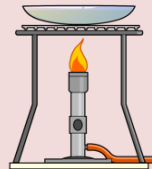
Separating an **insoluble solid** and a liquid:

- 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.



Reversible
Changes that can be done backwards

Irreversible
Changes that cannot be done backwards

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
Human Impact	The activities by human beings can have a dramatic effect on the habitats of other living things. Pollution and global warming are destroying many natural habitats .
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

Organism Dies

Buried quickly by sediments

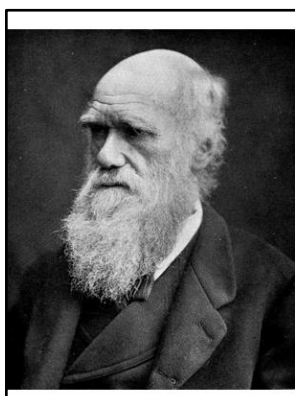
The body rots away and minerals replace the bones. Over millions of years, it turns to rock.

Rocks are moved up by the Earth, and the fossil gets exposed

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!**

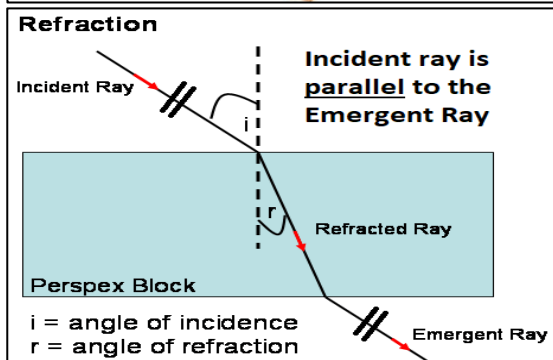
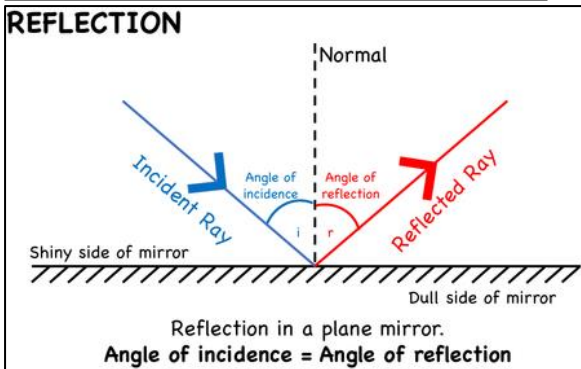
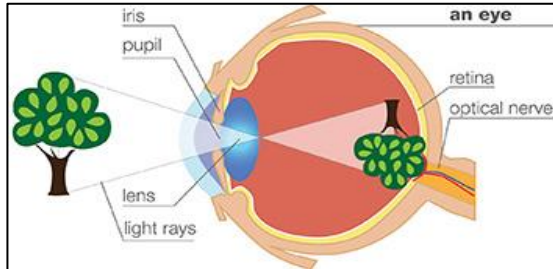
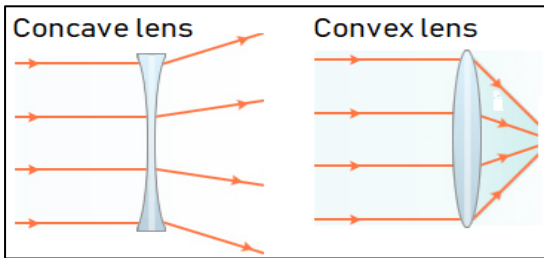
Y7 SCIENCE KNOWLEDGE ORGANISER

UNIT 4 [Spring / Summer]



Reversible	Types Of Change	Irreversible	How can we show reactions? Word Equation: Iron + Sulphur → Iron Sulphide [Reactants] [Products]
Temporary		Permanent	
Physical change - No new material [same particles]		Chemical Reaction – New material [particles rearranged]	

Symbol Equation:
 $Fe + S \rightarrow FeS$
 - 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

Days 1 - 6
The lining of the uterus is shed as a few drops of blood. The old egg leaves the body.

Days 7 - 28
The new uterus lining will grow, ready to receive a fertilised egg

Day 14
A new egg cell is released from the ovary

The egg could get fertilised by a sperm

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 [amniotic fluid]**

Bag of fluid, **Cord**, **Placenta**

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.

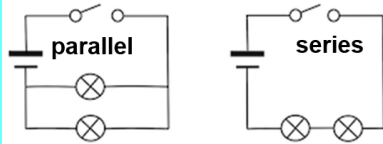
Y8 SCIENCE KNOWLEDGE ORGANISER

Unit 4 [Spring / Summer]



How do series circuits differ from parallel circuits?

Circuit Types



	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

PERIODIC TABLE

Periods go across – the elements increase in atom size as we move to the right and down

Groups go downwards – the elements increase in atom size as you go downwards - Elements in the same group have similar properties

Why are bees so important?

All bees: Estimated **1/3 of food** is pollination dependent

A colony: Pollinates **4,000 m²** fruit trees

Makes avg **14kg** of honey

Pollinate **70** types of crop

Contribute **£400 million** to the economy

Contains **50,000** bees

Make **6,000** tonnes of honey

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].
Metal	Most elements are metals. They are shiny, usually hard, good conductors of heat and electricity, malleable [bendable] and ductile [can be stretched]. Non-metals have opposite properties
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 reactive 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

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

The **petals** attract insects.

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

The **filament** holds up the anther.

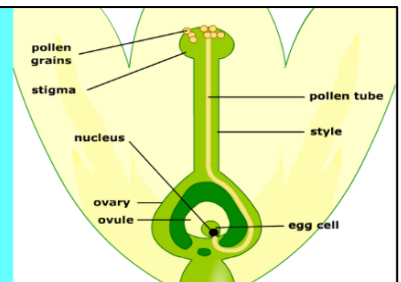
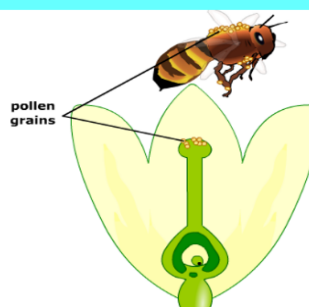
The **sepal** leaves protect the flower before it opens.

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

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

Pollination

This is the transfer of pollen from 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