

THE KNOWLEDGE Year 7 B1.3

Reproduction

Sentence starters:

- During sexual intercourse the
- Substances are passed between a mother and her fetus

Adolescence: During adolescence your body goes through physical changes; this is called **puberty**.

Changes that happen to both boys and girls include:

- Pubic hair and under arm hair grows, body smell becomes stronger, you experience emotional changes and have a growth spurt.

Changes in girls:

- Breast develop, hips widen, period start.
- Ovaries start releasing egg cells

Changes in boys:

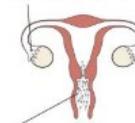
- Voice breaks
- Testes and penis get bigger
- Testes start making sperm
- Hair grows on face and chest

Glossary:

Gametes
Ejaculation
Embryo
Implantation
Puberty
Gestation
Periods
Ovulation
Contraception

Fertilisation and Implantation:

One egg is released from an ovary every month.



Sperm swim from the vagina, through the cervix, and into the uterus.

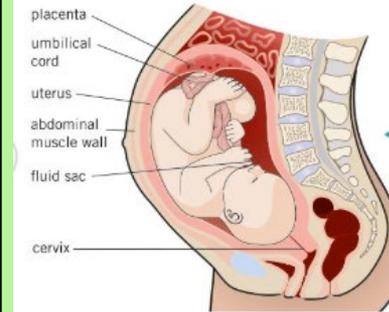
If sperm meets an egg in the oviduct, fertilisation occurs.



Many sperm die before they reach the oviduct.



The fertilised egg travels down the oviduct and implants in the uterus.

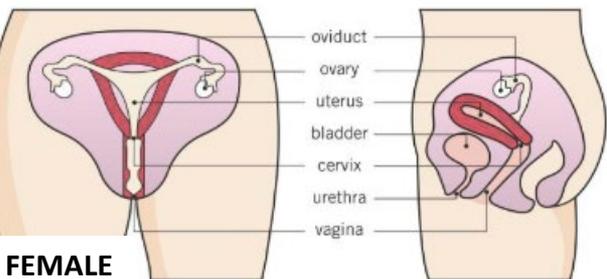
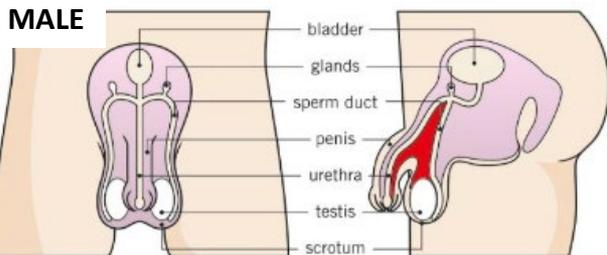


Development of the fetus:

In humans it takes 40 weeks (**gestation**) for a fertilised egg to develop into a baby.

Reproductive Systems:

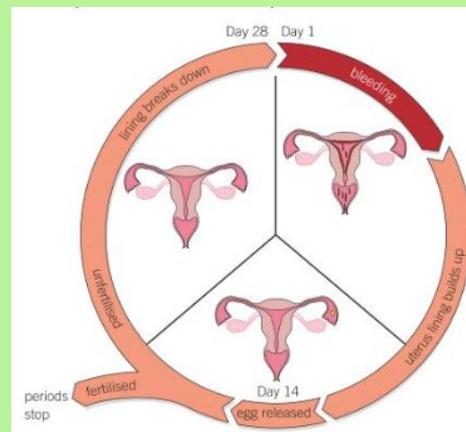
MALE



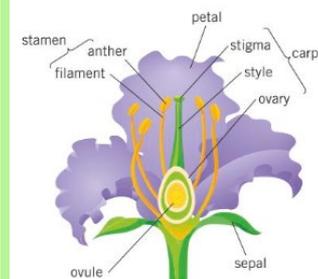
FEMALE

The Menstrual Cycle:

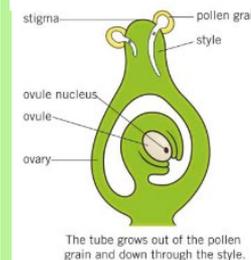
Day 1: The uterus lining breaks down.
Day 5 : Bleeding stops, a **period**. The uterus lining starts to re-grow
Day 14: An egg cell is released from one of the ovaries, this is **ovulation**.



Flowers, Pollination, Fertilisation, Germination and Seed Dispersal:



- Seeds can be dispersed by: animals, water, wind or explosive dispersal.
- Seeds need water, warmth and oxygen for **germination**.



The tube grows out of the pollen grain and down through the style.



The pollen nucleus moves down the tube.



The pollen nucleus joins with the ovule nucleus. Fertilisation takes place and a seed will form.

THE KNOWLEDGE

Reactions

Year 7 C1.3

Sentence starters:

A chemical reaction is when....

We test for carbon dioxide by....

In any chemical reaction the total mass of reactants is...

Chemical reactions:

A chemical reaction is a change in which atoms are rearranged to create new substances.

Most chemical reactions are not easily **reversible**. At the end of the reaction it is very difficult to get back what you started with.

How do you know if a chemical reaction has happened?

- 1) See huge flames or tiny sparks
- 2) Notice a sweet smell or foul stink
- 3) Feel the chemicals getting hotter or colder
- 4) Hear a loud bang or gentle fizzing

Some reactions happen quickly, others are much slower. Chemists use **catalysts** to speed up slow reactions. A catalyst is not used up in a reaction.

Word equations: In a chemical reaction, the starting substances are called **reactants** and the substances that are made are called **products**.

A word equation shows the reactants on the left and the products on the right.

The arrow means '**reacts to make**'.

The word equation for the reactions of iron and sulphur is:



Rearranging atoms:

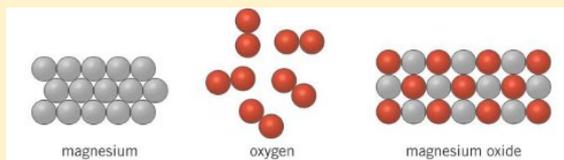
When magnesium burns in air, it reacts with oxygen to form magnesium oxide.

The reactants and products look different.

Reactants – shiny magnesium and invisible oxygen gas

Products – white magnesium oxide powder

In every chemical reaction, the atoms get rearranged.

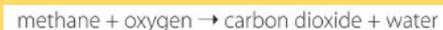


Glossary

Reversible
Reactants
Products
Combustion
Catalyst
Fossil fuels
Non-renewable
Thermal decomposition
Conservation
Endothermic
Exothermic

Burning fuels:

A **fuel** is a substance that burns to transfer energy by heating. Burning is also called **combustion**. When something undergoes combustion there are usually two products:



Petrol, diesel and coal are **fossil fuels**, they are **non-renewable** meaning they cannot be replaced once they are used up.

Oxidation, is when substances react with oxygen. Rusting is an example of oxidation, where iron reacts with oxygen and water.

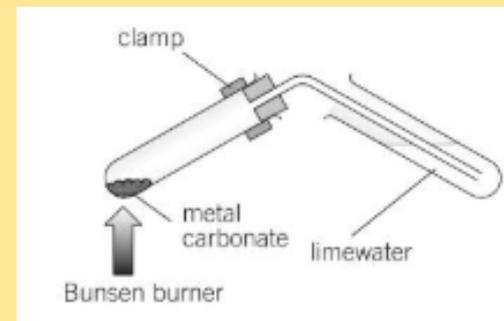
Thermal decomposition:

A **decomposition** reaction is when a compound breaks down into simpler compounds or elements. A **thermal decomposition** reaction is when the substance breaks down when it is heated.

Copper carbonate is a green compound, when you heat it, it breaks down into copper oxide and carbon dioxide.



We can prove that the gas is carbon dioxide by bubbling it through limewater and the limewater will go cloudy.



Conservation of mass:

In any chemical reaction the total mass of the reactants is equal to the total mass of products.

Endothermic and exothermic:

Endothermic – the surroundings transfer energy to substances e.g. melting and boiling.

Exothermic – energy is transferred to the surroundings e.g. burning wax.

Space

Year 7 P1 Space

The Night Sky

We can see artificial satellites using the naked eye. The Moon is the Earth's natural satellite, it orbits the Earth.

Meteors are bits of dust or rock that burn up as they move through the Earth's atmosphere. Any meteor that makes it to earth is known as a meteorite.

Lots of the dots we see in the sky are stars in our galaxy, the Milky Way.



Sentence starters:

A satellite is an object that orbits.....

The solar system is made up of ...

Day and night is caused by...

The phases of the moon are....

The Moon

The moon takes 27 days and 7 hours to orbit the Earth once.

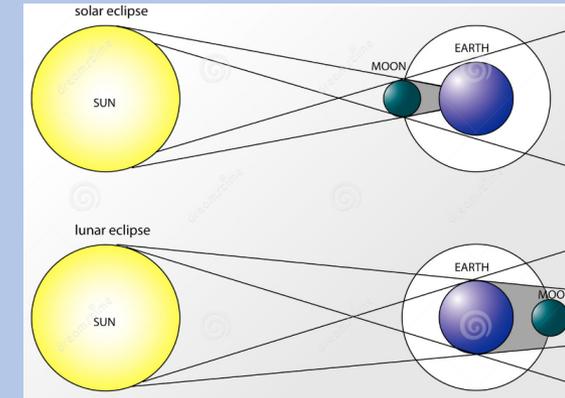
Half the moon is lit up by the Sun all the time. As the Moon moves round the Earth it looks different from the Earth. The changes in shape of the Moon as known as the phases of the Moon.

The phases of the moon include new, crescent, first quarter, gibbous, full, gibbous, third quarter and crescent.

A lunar month is the time from one new moon to the next.

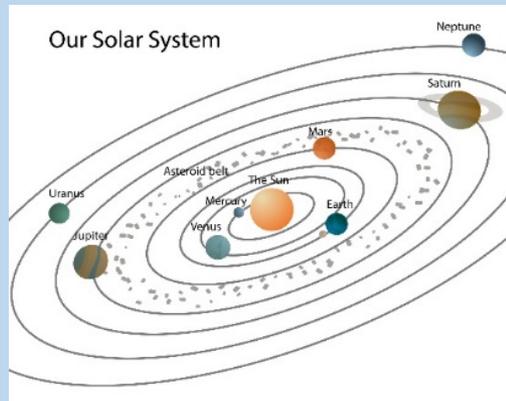
A solar eclipse happens when the Moon blocks the light from the Sun.

A lunar eclipse happens when the Earth comes between the Sun and the Moon.



The Solar System

The solar system is made up of 4 inner planets and 4 outer planets. All the planets orbit the Sun. The inner planets are all terrestrial planets; they are made of rock. The outer planets are gas giants. Many planets have moons which orbit them. Saturn has 60 moons but Earth has only one.



There are thousands of pieces of rock in the asteroid belt, some are tiny specs of dust but one is large enough to be called a dwarf planet. Ceres is the only dwarf planet inside the orbit of Neptune.

The Earth

There is day and night on Earth because Earth spins on its axis. It takes 24 hours to complete one full spin. The Sun rises in the East each morning and sets in the West.

The Earth moves round the Sun once a year.

The Earth's axis is tilted to 23.4°. The days are longer in the Summer and the sun is higher in the sky.



Glossary

Satellites

Planets

The sun

Orbit

Eclipse

The moon

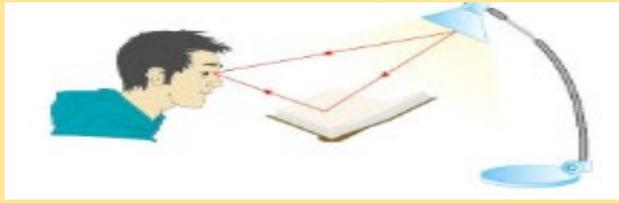
Constellations

Lunar eclipse

Solar eclipse

Stars

Light



Light travels in straight lines and we can see objects because light **reflects** from them. Light sources are **luminous** and they **emit** light. **Transparent** objects like glass **transmit** light. **Translucent** objects like frosted glass allow some light through them but you cannot make out any details. **Opaque** objects allow no light to pass through them. Light travels very quickly. It moves at a speed of 300 000 000 m/s. This is about a million times faster than sound. Unlike sound, light does not need a **medium** to carry it so it can travel through a **vacuum**.

Sentence starters:

The sun is luminous because

The difference between specular and diffuse reflection is

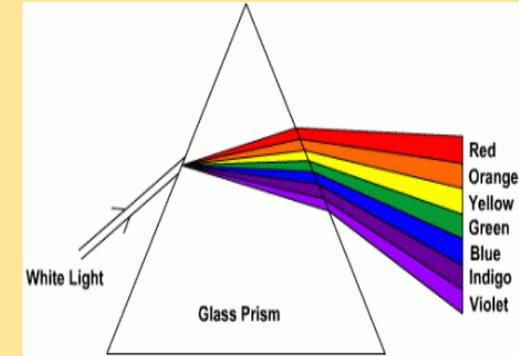
A prism disperses white light to

Glossary

- Angle of incidence
- Angle of reflection
- Convex
- Dispersion
- Incident ray
- Inverted
- Law of reflection
- Luminous
- Medium
- Opaque
- Prism
- Refraction
- Specular reflection
- transmit

Colour:

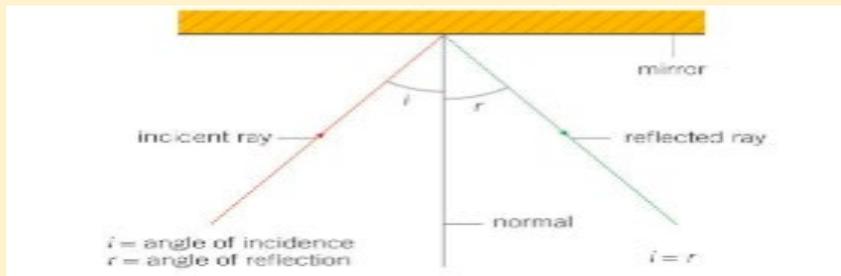
The colours of the rainbow are all contained in white light.



Red, blue and green are called the **primary** colours. Mixing them gives us **secondary** colours.



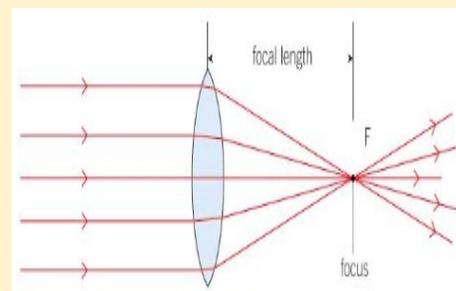
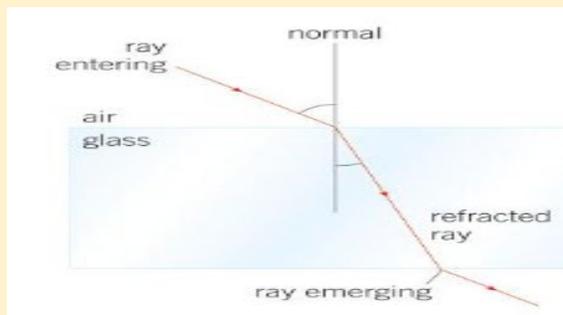
Reflection of Light:



The angle of incidence is equal to the angle of reflection. This is the law of reflection. Reflection from a smooth surface is called **Specular Reflection**. Reflection from a rough surface is called **Diffuse Scattering**.

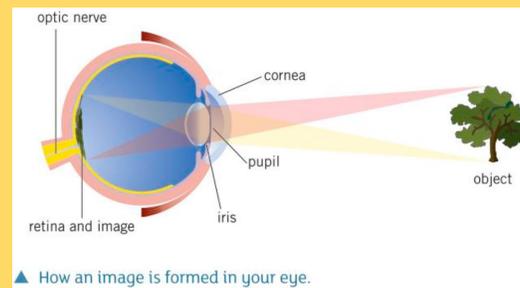
Refraction of Light:

Light changes direction when it passes from one **medium** to another. This is called **refraction**.



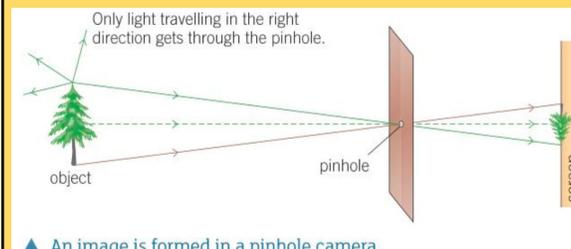
Lenses use refraction to make light rays **converge** at a **focus** or **focal point**.

The Eye and the Camera:



▲ How an image is formed in your eye.

Our eyes focus light onto the **retina** at the back of the eye. This is an **inverted** image.

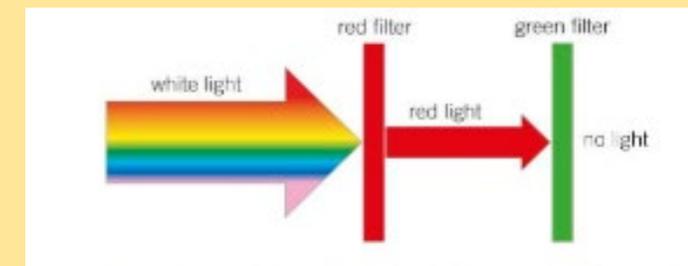


▲ An image is formed in a pinhole camera.

Pinhole Cameras form an image in exactly the same way. Modern digital cameras record images on a **CCD** (Charge Couple Device).

Colour filters:

These **transmit** one colour and **absorb** the rest.



What makes objects different colours?

They **reflect** one colour while they **absorb** all the other colours.

