



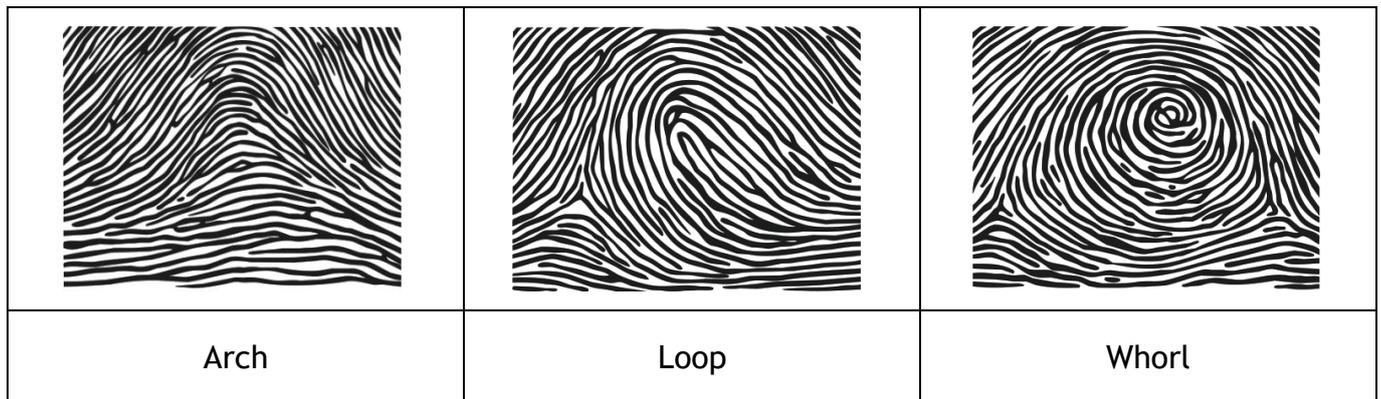
**Stonelaw High School  
Science Faculty**

**BGE Science  
Stonelaw Forensic Files  
Case Notes**

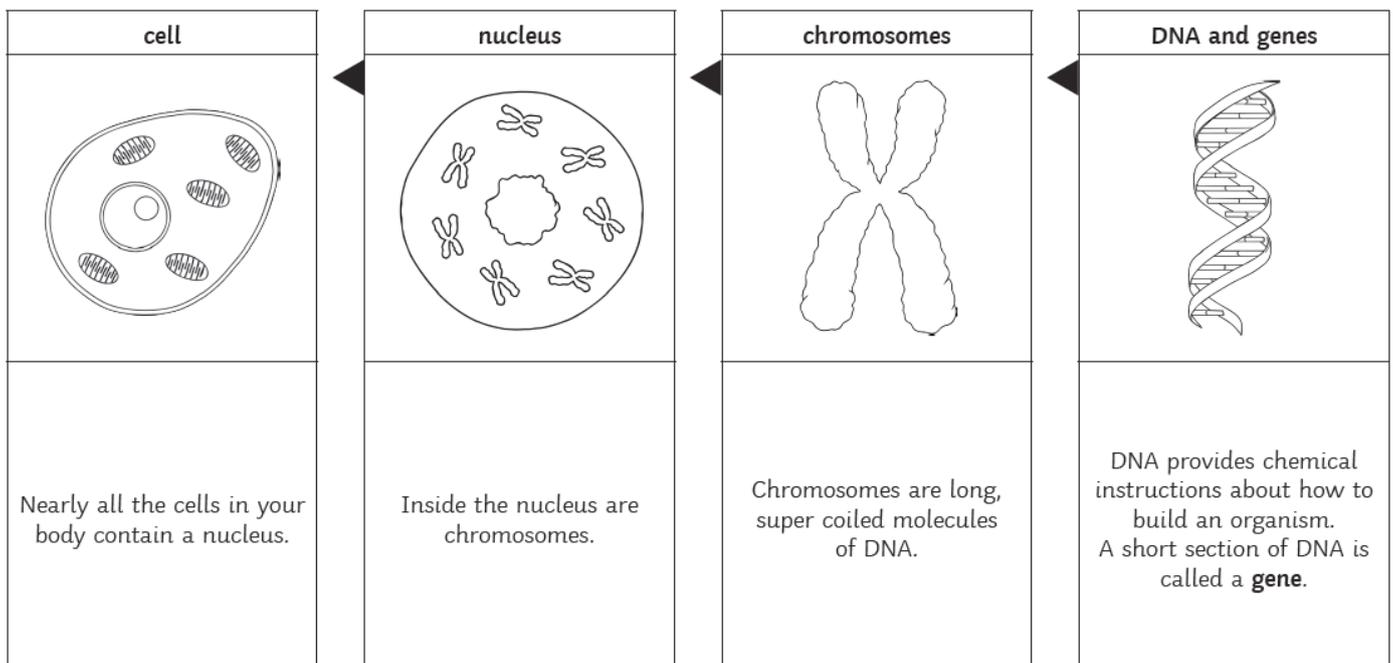


## Fingerprints

Fingerprints can be used to identify a person as each person has a unique set of fingerprints which do not change throughout their life. They are classified as a loop, arch, or whorl (L.A.W).



## DNA



DNA is found in the nucleus of most cells.

It contains the genetic instructions for the development and function of living things.

Everyone's DNA is different as each individual has a unique combination of genes.

A gene is a piece of DNA which controls specific characteristics in an individual.

<https://www.bbc.co.uk/bitesize/guides/zp7thyc/revision/1>

## DNA Profiling

DNA is unique to a person.

DNA profiling can be used to solve crimes, settle paternity suits and predict future health risks.

<https://www.bbc.co.uk/bitesize/guides/z8nxtyc/revision/6>

## Chemical Reactions

A chemical reaction is a process where two different substances react together to form a new substance.

There are 4 signs that a chemical reaction has occurred:

- Colour change
- Precipitate formation (a solid forming)
- Release of a gas (effervescence)
- Noticeable energy change (feels warm or cold)

<https://www.bbc.co.uk/bitesize/guides/zfjdd6f/revision/1>

## Paper Chromatography

Paper chromatography is used to separate soluble substances from one another.

It is used when the dissolved substances are mixtures such as inks, food colourings and plant dyes.

The mixture must be soluble in the chosen solvent for it to be separated successfully.

Water and alcohol are examples of solvents.

<https://www.bbc.co.uk/bitesize/guides/zqc6w6f/revision/4>

## Forces

Forces are often referred to as a push and a pull.

Forces affect the speed, direction or shape of an object. They can make an object start to move, stop moving, move faster or move more slowly. They could also make an object change its shape or cause a moving object to change direction.

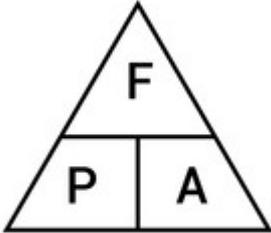
To measure the size of a force, we can use an instrument called a Newton Balance. Forces are measured in Newtons (N).

Friction is a force between two different surfaces that slide against each other.

## Pressure

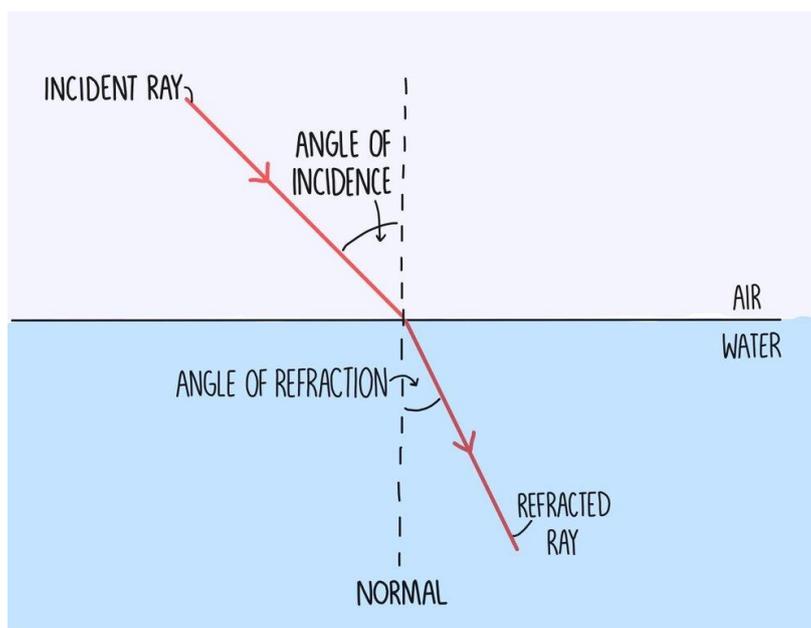
Pressure is exerted whenever a force is applied over an area.

The pressure exerted depends on the size of the force on the object and the area. The greater the force, the greater the pressure. The smaller the area, the greater the pressure.

$$F = P \times A$$

$$P = \frac{F}{A} \qquad A = \frac{F}{P}$$

## Refraction

Refraction is when light waves change speed as they pass from one material to another. This causes them to change direction.



The angle of incidence is the angle between the normal and the incident ray.

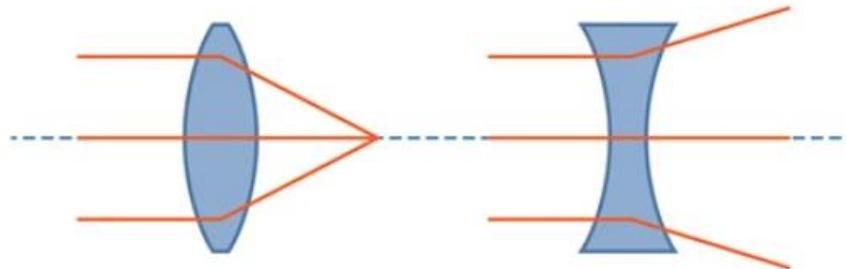
When going from air to glass/plastic/water, the angle of refraction is smaller than the angle of incidence. It can be measured by finding out the angle between the refracted ray and the normal.

## Lenses

A lens is a curved piece of transparent glass or plastic that refracts light.

Convex lens refract the light rays towards a focal point. It is also known as a converging lens.

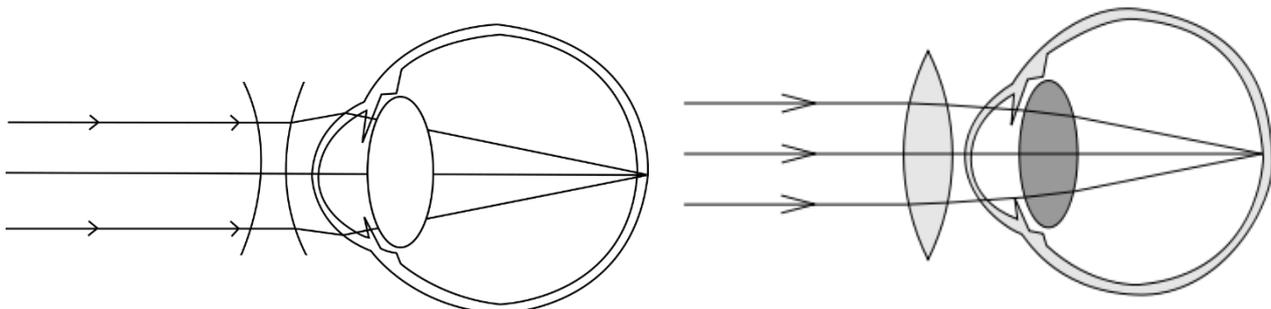
Concave lens refract the light rays outwards and do not come to a focal point. It is also known as a diverging lens.



## **Vision Problems**

Short sightedness is when the rays focus before the retina. This makes distant objects blurry. To correct this a concave lens is used to make glasses.

Long sightedness is when the rays focus after the retina. This makes close objects blurry. To correct this a convex lens is used to make glasses.



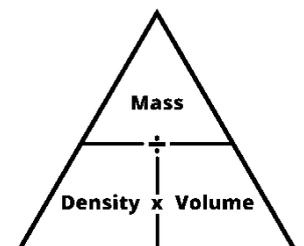
<https://www.bbc.co.uk/bitesize/guides/zq7thyc/revision/4>

## Density

Density describes how much space an object takes up (its volume) in relation to the amount of matter in that object or substance (its mass).

Density is the amount of mass per unit of volume.

If an object is heavy and compact, it has a high density. If an object is light and takes up a lot of space, it has a low density.



<https://www.bbc.co.uk/bitesize/guides/zc9q7ty/revision/2>

## Weight

The mass of an object is the amount of matter or 'stuff' it contains. The unit of mass is kilograms (kg).

Gravity is a force exerted by one object on another when they are near each other. Force is measured in Newtons (N). Gravity is affected by the size and the distance between the objects.

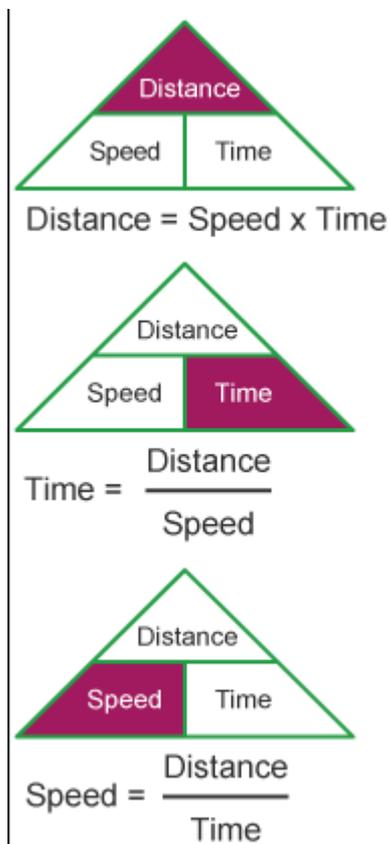
The Earth has a gravitational field strength of 9.8 Newtons per kilogram (N/kg).

Weight can be worked out by multiplying the mass by the force of gravity.

<https://www.bbc.co.uk/bitesize/topics/z4brd2p/articles/z6xjdp3>

## Speed, Distance, Time

The speed of an object tells you how far an object has travelled per second.



<https://www.bbc.co.uk/bitesize/topics/z83rkqt/articles/zhbtng8>