

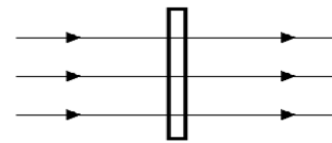
Section 1- Travelling light

Objects which give out (emit) light are **luminous sources**. We can see non-luminous objects because light bounces (reflects) off them and enters our eyes e.g the Moon

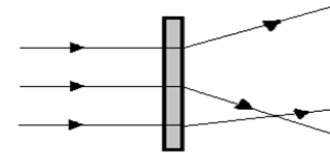


▲ You see objects because light reflects off them.

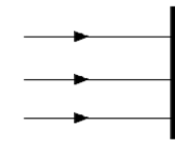
Some objects allow light to travel through them. We say the light has been transmitted through the object. Some objects absorb the light and others reflect it.



Transparent:
Light travels straight through



Translucent:
Light passes through but is scattered in random directions



Opaque:
Light does not pass through, it is either reflected or absorbed

Shadows are created because light travels in straight lines and cannot bend around objects.

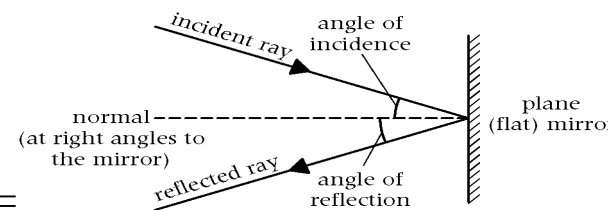
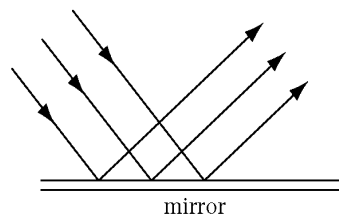
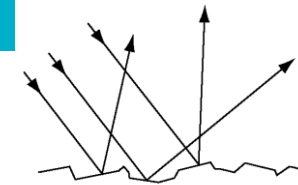
A solar eclipse happens when the Moon passes directly between the Sun and the Earth - on the same line - casting a shadow of the Moon on the surface of the Earth



Light can travel through a vacuum (an area with no particles).
Light travels as a wave.

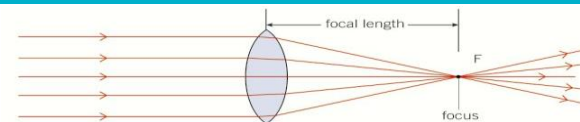
Section 3 - Reflection

Light rays are **scattered** by rough surfaces, and a **reflection** cannot be seen (diffuse scattering).
A **plane** mirror is a flat mirror. Light is reflected evenly by a plane mirror (specular reflection).



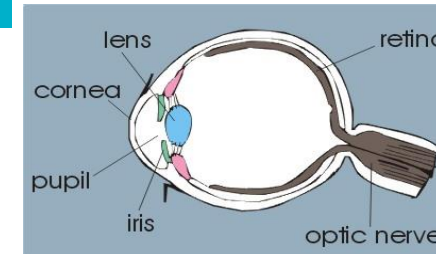
The law of reflection is the angle of incidence is always equal to the angle of reflection.

Section 6 - Eye lens



The lens in each eye is a convex or converging lens. The lens refracts the light to a focal point or focus point.

Section 5 - How do we see?



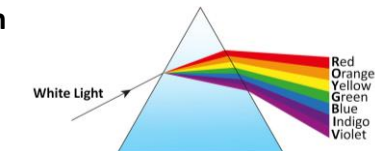
The pupil allows light to enter. The iris is a muscle that controls the size of the pupil.
The cornea and lens refract the light onto the retina. The retina has photoreceptor cells that absorb the light.

There are two types of photoreceptors, rods detect low light levels and cones detect colour. The photoreceptors produce an electrical signal which travels to the brain via the optic nerve.

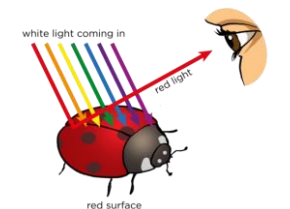
Section 7 - Colour

White light can be split up using a **prism** to give a **spectrum** of seven colours (red, orange, yellow, green, blue, indigo, violet). The splitting of colour into a spectrum is called **dispersion**

Low frequency red light is refracted the least and high frequency violet light is refracted the most.



We are able to see colours because objects do not reflect all the colours in light.
A red object only reflects red and all other colours are absorbed.
White objects reflect all the colours.
Black objects absorb all colours.



Section 2 - How fast is light?

It takes just over 8 minutes for light to reach Earth from the sun. The speed of light travels at is 300 000km/s. Sound travels slower than light- a million times slower. This is why we see the flash of lightening before we hear the sound of the thunder.
Astronomers use light-time to measure distances in space. A light year is the distance light travels in a year.

Section 4 - Refraction

Refraction is the **change in speed** of light as it moves between materials of different densities.

If it hits the material at an angle, it will cause a change in direction.

If light slows down (e.g. from air to glass as glass is more dense) it will bend towards the **normal**.

When it travels back out it speeds up again and bends away from the normal.

