

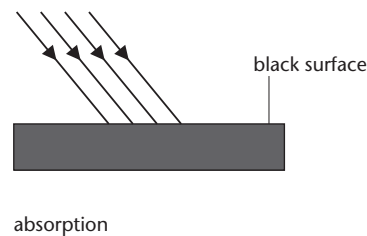
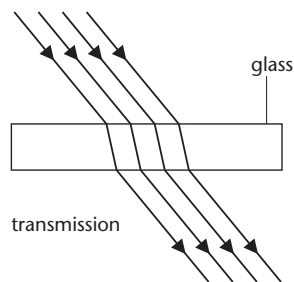
## Light

Objects that create light are **luminous sources**. Light travels in straight lines from a source.

Light travels through **transparent** objects but not through opaque objects. **Shadows** are made when light is blocked by an object. Opaque objects block all light. **Translucent** objects show a glow of light through them.

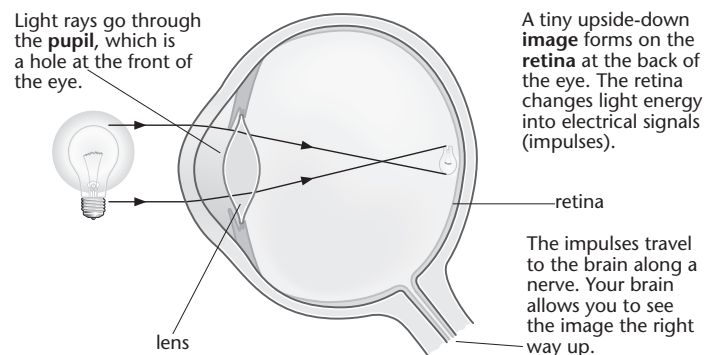
## Transmission and absorption

Transparent materials let light pass straight through. We say they **transmit** light. Opaque surfaces can **absorb** or **reflect** light. White surfaces reflect most of the light that hits them. Black surfaces absorb light very well and reflect very little. This is why they look so dark. The energy transferred by light is converted to heat energy when an object absorbs light.



## Cameras and eyes

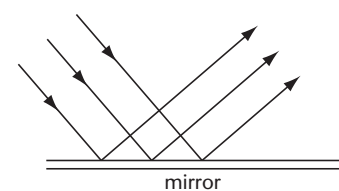
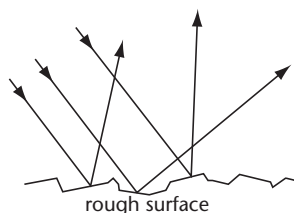
A pinhole camera is a simple camera with a small hole in one end and a screen at the other. It works in a similar way to our eyes.



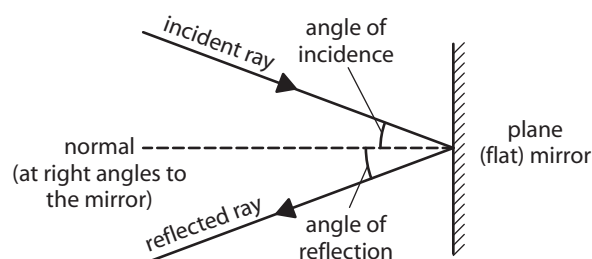
## Reflection

Light rays are **scattered** by rough surfaces, and a **reflection** cannot be seen.

A **plane mirror** is a *flat* mirror. Light is reflected evenly by a plane mirror.

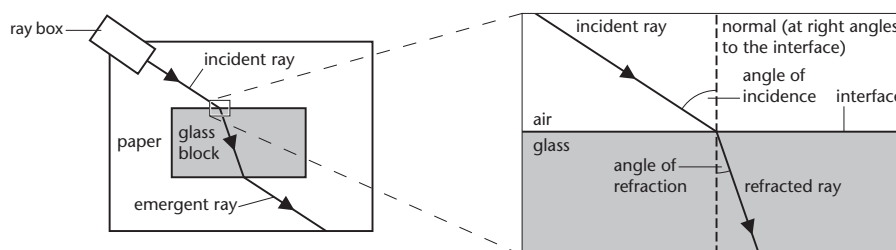


When light shines onto an object viewed in a mirror, the rays are **reflected** into the eye. The rays seem to come from a position behind the mirror. The image is the **same size** as the object and the **same distance** from the mirror. In the image left is right and right becomes left. The **angle of incidence** is equal to the **angle of reflection**.



## Refraction

When light hits something transparent it changes speed and direction. This is called **refraction**. Refraction takes place at the **interface** between two substances. When light is transmitted through glass it slows down and changes direction *towards* the normal. When it travels back out it speeds up again and changes direction *away from* the normal.



**Lenses** are curved pieces of glass or transparent plastic that are designed to refract light in particular ways. Some lenses make rays of light come together, and some lenses make the light spread out. Lenses are used in cameras, microscopes and telescopes.

## Colour

White light is a mixture of colours. 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.

We are able to see colours because objects do not reflect all the colours in light. White objects reflect all the colours, but a red object only reflects red and all other colours are absorbed. This idea applies to all colours except black – black objects absorb all colours.

