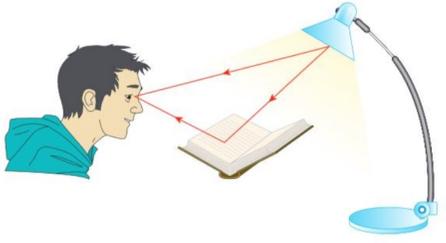
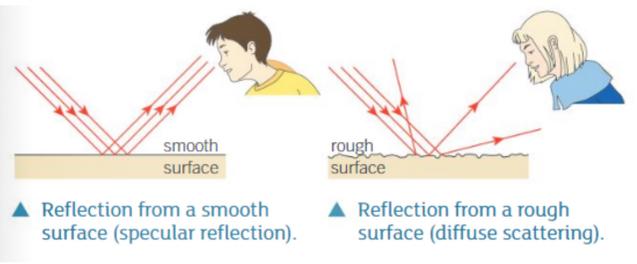


Section 1: Light		
Property	Definition	Example
Luminous	An object which is a source of light, /an object which emits its own light.	A light bulb, The Sun, a star.
Non-Luminous	An object which needs to reflect light in order to be seen.	A book, The Moon
Transparent	Materials that transmit light; you can see clearly through them.	Glass, shallow water, Perspex
Translucent	Materials that scatter light as it passes through them so you cannot see clearly.	Frosted glass, tissue paper.
Opaque	Materials that do not transmit light and produce shadows.	Brick, wood

Light travels at **300,000,000 m/s** and a distance of **1 light-year** in a year.
 The sun is **150,000,000,000 m** from Earth, and light takes **8.3 min** to travel this distance.



▲ You see objects because light reflects off them.

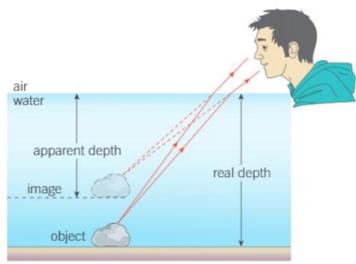


▲ Reflection from a smooth surface (specular reflection).
 ▲ Reflection from a rough surface (diffuse scattering).

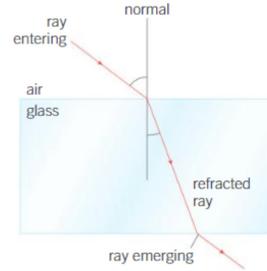
Section 2: Refraction

Refraction happens when light changes direction as it passes from one transparent **medium** (material) to another – from **air into glass**, for example.

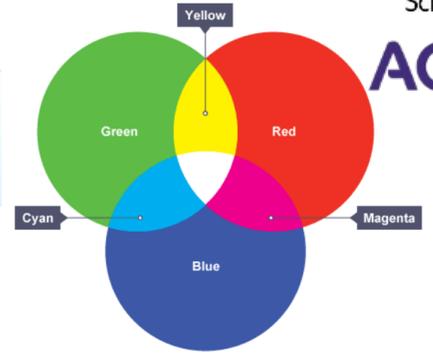
Glass is **more dense** than air, so the **angle of refraction** is smaller **than the angle of incidence**. If the surfaces of the medium are parallel, the emergent ray is parallel to the incident ray.



▲ A rock at the bottom of a pool looks closer to the surface than it actually is.



▲ Light is refracted when it slows down.

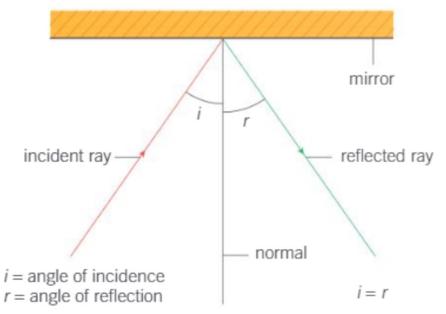


Section 2: Reflection

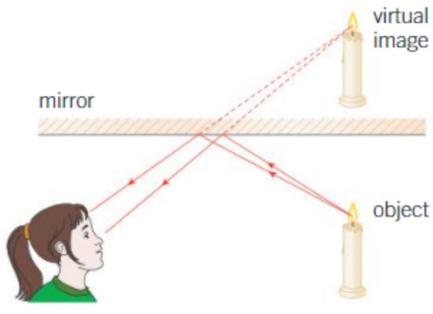
Specular reflection occurs from a smooth, flat surface such as a **plane mirror**.

The **angle of reflection**, between the ray and the **normal**, is equal to the **angle of incidence**.

Diffuse scattering occurs when light reflects from a rough, uneven surface such as a wall.



▲ Light is reflected at equal angles.



▲ You see an image in a mirror.

Reflection produces a **virtual image** equally behind the mirror as the object is in front.
 This image is constructed by **virtual rays**.

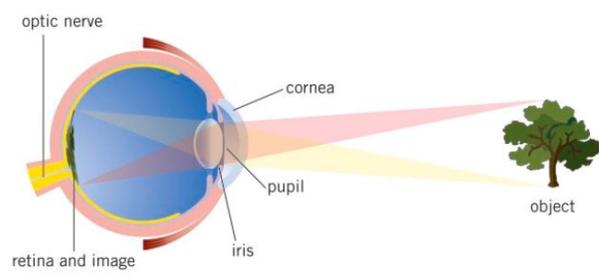
Section 4: The Eye and the Camera

Light reflected from an object enters the eye through the transparent **cornea**, then the **pupil**. The size of the pupil is controlled by a muscle called the **iris**.

An **inverted** (upside down) **image** is formed on the **retina**.

Photoreceptors in the retina send electrical **impulses** to the brain along the **optic nerve**. They eye can be compared to a **pinhole camera**.

How do you see?



▲ How an image is formed in your eye.

Section 5: Colours

	White paper	Red apple	Green apple
How it looks in white light	White (no colours absorbed)	Red (all colours absorbed except red)	Green (all colours absorbed except green)
How it looks in red light	Red (only red light to reflect)	Red	Black (no green light to reflect)
How it looks in green light	Green (only green light to reflect)	Black (no red light to reflect)	Green
How it looks in blue light	Blue (only blue light to reflect)	Black (no red light to reflect)	Black (no green light to reflect)