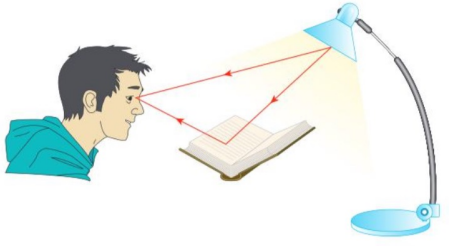
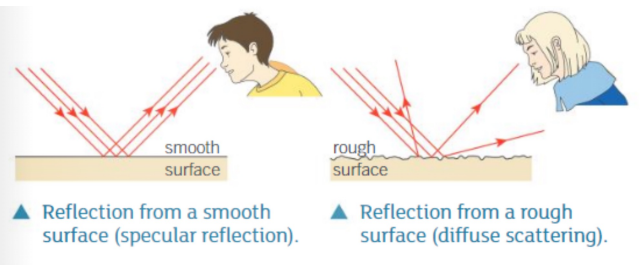


Section 1: Light		
Property	Definition	Example
<b>Luminous</b>	An object which is a <b>source</b> of light, /an object which <b>emits</b> its own light.	<b>A light bulb, The Sun, a star.</b>
<b>Non-Luminous</b>	An object which needs to <b>reflect</b> light in order to be seen.	<b>A book, The Moon</b>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

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.

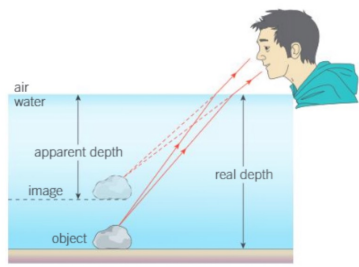


▲ Reflection from a smooth surface (specular reflection).  
 ▲ Reflection from a rough surface (diffuse scattering).

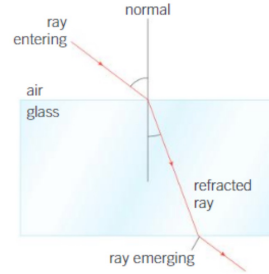
## Section 2: Refraction

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

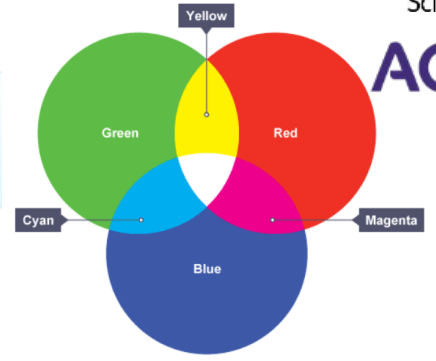
Glass is **more dense** than air, so the **angle of refraction** is smaller **than the angle of incidence**. If the surfaces of the medium are parallel, the emergent ray is parallel to the incident ray.



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



▲ Light is refracted when it slows down.

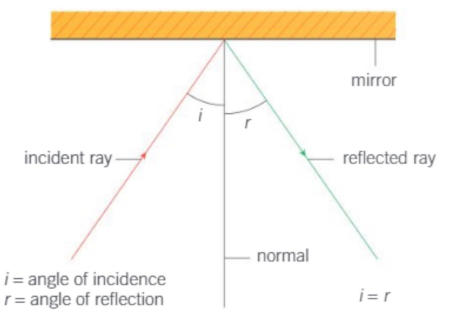


## Section 2: Reflection

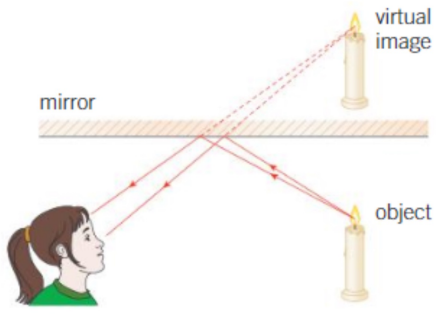
**Specular reflection** occurs from a smooth, flat surface such as a **plane mirror**.

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.



$i = \text{angle of incidence}$   
 $r = \text{angle of reflection}$



▲ 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**.

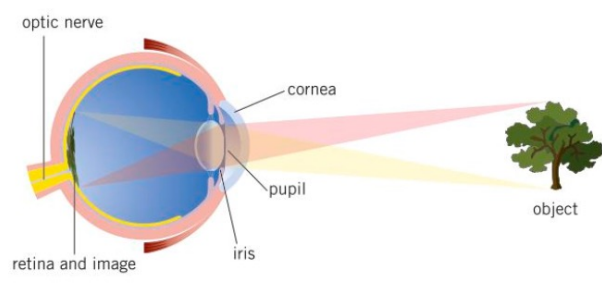
## Section 4: The Eye and the Camera

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