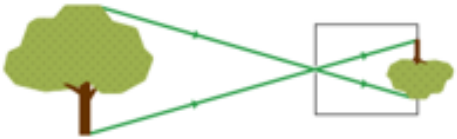
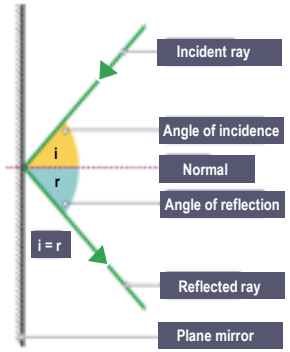
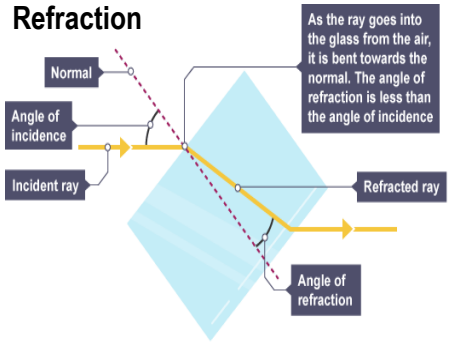
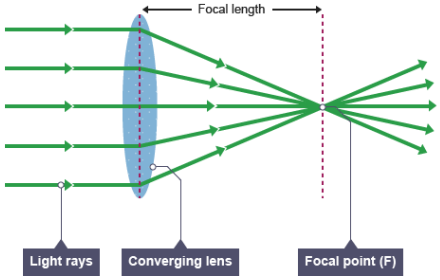
Light	• Light is energy that our eyes can detect • Light is made of waves • Light waves are part of a family of waves called electromagnetic waves • Electromagnetic waves all travel at the speed of light: 3,0000,0000m/s • The speed of light is the fastest known speed in the Universe • Light travels in straight lines from a source		
Luminous and non-luminous objects	• Luminous objects produce their own light e.g. the Sun, a lightbulb • Non-luminous objects don't produce their own light but can reflect light e.g. the Moon, planets		
Opaque, translucent and transparent objects	• An opaque object doesn't allow any light to travel though it • A translucent object allows some light to travel through it, but absorbs the rest • A transparent object allows all of the light to travel through it • A shadow is caused when an opaque object blocks the path of light rays		
Pinhole camera	• A pinhole camera uses a tiny hole to focus an image of an object onto a translucent screen • The image formed is inverted (upside down) and much smaller than the object 		
Reflection 	• When light rays from a source hit an object, they can be reflected (bounce off) • The light rays from the source are called incident rays and the rays that reflect are called the reflected rays • The Law of Reflection says that the angle of incidence is equal to the angle of reflection (i = r for short) • This is used in lots of ways, for example periscopes and optical fibres • The imaginary line at 90º to the surface being reflected is called the normal and it helps us to measure angles	**Diffuse and specular reflection**	• When all of the light rays hitting a surface are reflected in the same direction, this is called specular reflection. It happens on smooth, shiny surfaces like a plane (flat) mirror and we see an image on the surface • If all of the light rays are reflected in different directions, this is called diffuse reflection. This happens on dull, rough surfaces

Refraction



- Light travels at different speeds in different materials
- When light moves from one material to another, it can either speed up or slow down
- When the ray of light hits a surface at an angle, one side of the ray slows downs while the others dies of the ray carries on at the same speed, causing the ray to change direction ('bend'). This is called refraction
- In a semi-circular block, light can be refracted but after the critical angle, the light gets reflected inside the block. This is called total internal reflection

Lenses

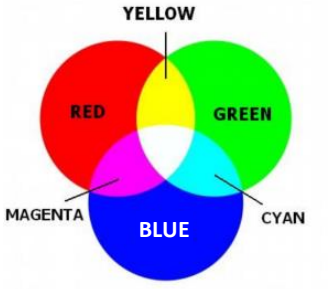


- Lenses use refraction to change the path of light
- A lens can focus rays of light at a point called the focal point
- The focal length is the distance between the lens and the focal length is the distance between the lens and the focal point
- Convex lenses bulge outwards. They cause light rays to come together and meet (converge)
- Concave lenses cave inwards. They cause light rays to spread out away from each other (diverge)
- Lenses are used in glasses to help light rays focus on the correct part of the eye

The spectrum of white

- A prism can be used to separate white light into a spectrum of seven colours. Different colours of light have different frequencies and wavelengths
- The order of the spectrum is red, orange, yellow, green, blue, indigo and violet (Richard Of York Gave Battle In Vain)
- Rainbows, the sky being blue and sunsets are all examples of dispersion

Seeing colours



- Different objects appear different colours as they reflect different parts of the spectrum
- White object reflect all the colours of the spectrum. Black objects absorb all the colours
- A red t-shirt looks red in white light because it only reflects red light. The other colours are absorbed
- We say that red, green and blue are the primary colours. All other colours are seen as a result of seeing a mixture of red, green and blue
- The secondary colours are magenta, cyan and yellow
- A yellow t-shirt reflects green and red light and absorbs the other colours
- A blue t-shirt would look black in red light as there is no blue light to reflect and it absorbs the red light