

What is light and how can it be used?

Key scientist

Sir Isaac Newton (1643 - 1727)



Working Scientifically



Research what parts of the body are required for us to see.
What are the different parts of the eye and how do they help us see?

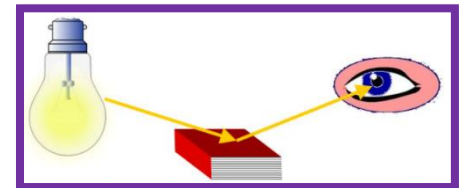


Which materials transmit the most light?
Which materials reflect/ absorb the most light?



How does the angle of the light source in relation to the object affect the length of the shadow created?

How do we see an object?



Light rays are emitted by a light source, hit the object and are reflected off it before entering the eye.

Key Knowledge

*Light is a form of energy that is part of the electro-magnetic spectrum.

*Light energy - in the form of light rays - always travels in straight lines.

*For us to see an object, light must travel from a light source, reflect off an object and enter our eyes.

*When light rays hits an object, they can either be reflected, transmitted or absorbed.

How the light rays behave will depend on the properties of the material hit:

Transparent materials transmit light.

Dull, opaque materials absorb light.

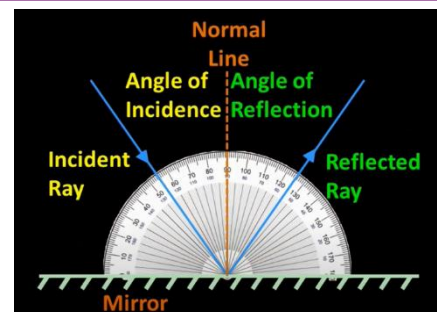
Shiny, opaque materials reflect light.

Translucent materials transmit less light than transparent materials - some of the light energy is also reflected or absorbed.

*The size and shape of shadows are affected by the distance between the light source and object creating the shadow AND the angle of the light source to the object.

*So that we can see, our eyes and brain work together.

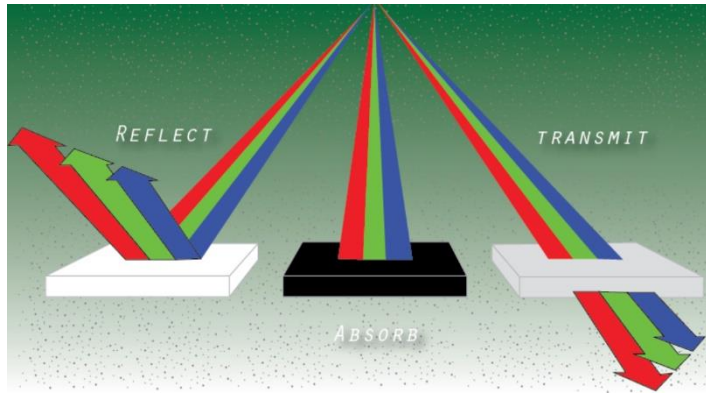
*Light travels at different speeds through different materials and this can affect how we see things, e.g. objects may appear to be bent in water (as light refracts).



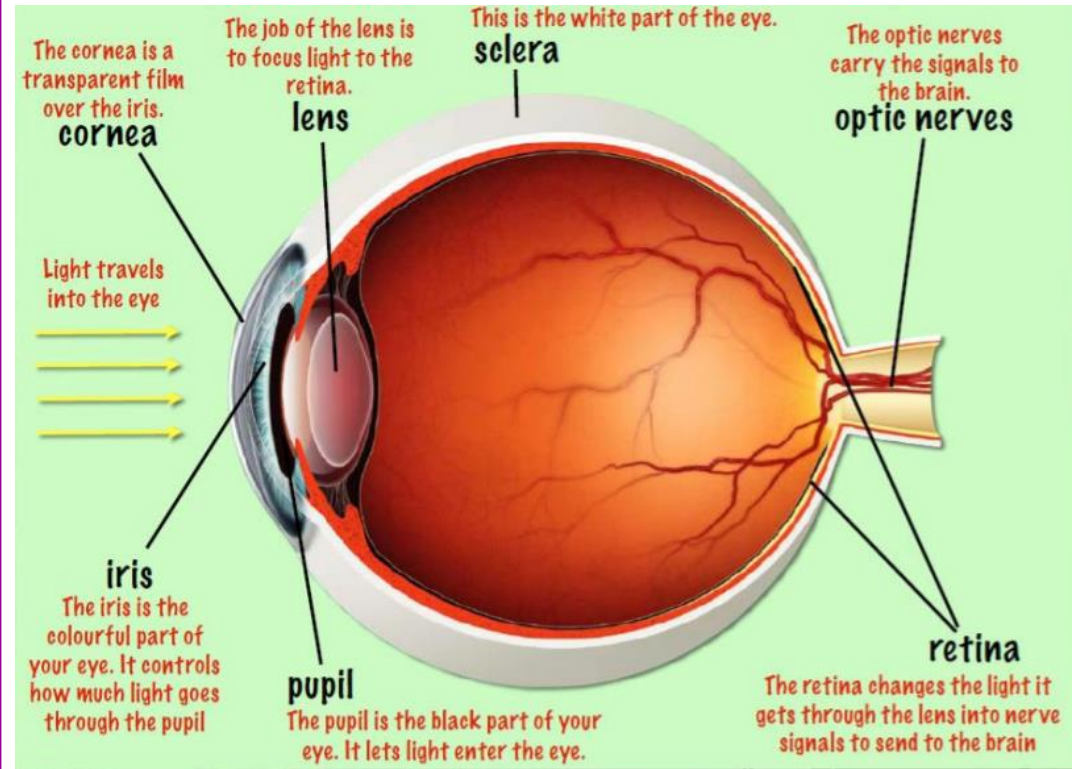
Key Vocabulary:

Absorb		To get held/ trapped (in a material).
Emits		To give out (produce) light rays.
Light source		An object that emits its own light energy.
Opaque [Year 3]		Objects that do not let any light pass through them.
Properties		The nature of a material/ object.
Reflect		To bounce back off a surface.
Refract		The bending of light as it passes from one substance to another (caused by the difference in density).
Translucent [Year 3]		Objects that let some light rays through but scatter others so they can't be seen through clearly.
Transmit		To allow to pass through.
Transparent [Year 3]		Objects that let all light rays travel through them.

How does light behave when it hits objects with different properties?

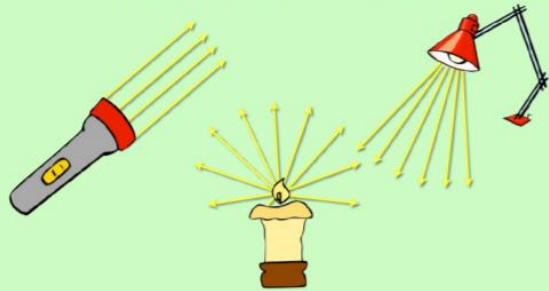


What parts is the eye made up of and what is the purpose of each?



How do shadows form and behave?

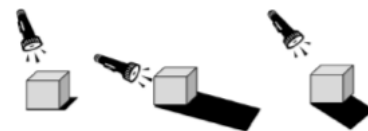
Light travels from a SOURCE and it always travels in a straight line. Light cannot bend or turn around corners.



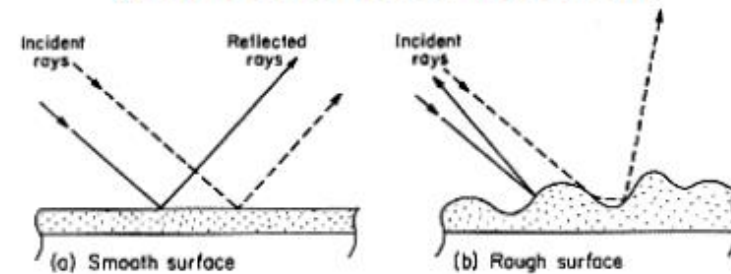
If an object blocks the light's path, it will form a shadow. It does not bend around the object.

A shadow's shape will be the same as the object which has blocked the light.

The size of the shadow changes as the light source moves, the further away from the light source the smaller the shadow is and the closer the light source is to the object the bigger the shadow. The angle of the light source also makes a difference to the size of the shadow.



What creates a clear reflection?



A smooth, shiny surface creates a clear reflection.