



# Y6 Science Knowledge Organiser—Light



## Key Knowledge

Learn these key facts—key points in red

### What is light and how does it behave?

Light is a form of energy made up of photons, which allows us to see things. We can see things because light is **reflected**. Light travels very quickly, in waves and in straight lines. Light behaves differently depending on what it comes in to contact with.

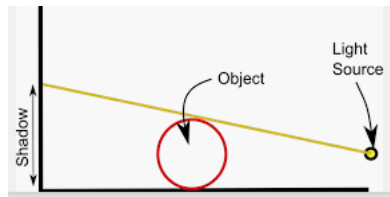
**Opaque**—objects reflect all light and make clear dark shadows.

**Transparent**—objects allow light to pass through and so do not create much **shadow**.

**Translucent**—objects scatter light and can create faint shadows.

Light normally travels in straight lines (**rays**) but when passing through transparent materials such as water and glass, light bends or turns – known as **refraction**. This is because different materials have different qualities and cause the wavelength of light to change.

Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.



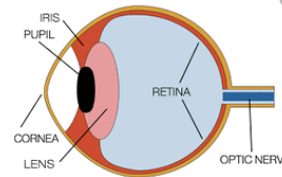
### How do we see?

We see through our eyes, which are organs that take in light and images and turn them into impulses that our brain can understand. Light rays bounce off objects and into our **eyes**, allowing us to see. The amount of light reflected from an object depends on the surface and the colour of the object (smooth, shiny and light colour reflect light best).

### Parts of the eye:

Light enters the eye through the pupil.

The iris helps the pupil change size depending on how bright the light is. Light then hits the retina at the back of the eye. The retina turns light into signals the brain understands. The optic nerve takes signals from the rods and cones to the brain. The brain sends feedback signals to the lens telling it how to focus so we can see clearly.



### Spectrum of light:

Light is made of many different colours (white light), known as the **spectrum**. When light hits an object, some of the colours are absorbed by the object and some are reflected. This enables us to see objects in different colours.



### Focus Scientist — Neil deGrasse Tyson

**Tyson**

Neil deGrasse Tyson



(b.1958) is an American astrophysicist, cosmologist and planetary scientist. He is also a passionate advocate for the power of science and presented the wonderful TV show Cosmos: A Spacetime Odyssey.

### Focus Scientist — Sir Isaac Newton

**Sir Isaac Newton** (1643-1727) studied Science and philosophy at the University of Cambridge. Among other things he discovered when light travels through a prism it is refracted and this proves that white light is made up of the colours of the rainbow.



## Key Vocabulary

Understand these key words

Word	Definition
<b>eyes</b>	globular organs of sight in the head of humans and vertebrate animals.
<b>filter</b>	a device to remove unwanted material (liquid, gas, light or sound).
<b>light</b>	the natural agent that stimulates sight and makes things visible.
<b>light source</b>	something that provides light, whether it be a natural or artificial source of light (e.g. the sun, a torch).
<b>opaque</b>	an object which does not allow light to pass through (e.g. wood).
<b>translucent</b>	an object which allows some light to pass through it. It may be possible to see some unclear images through the object (tissue paper).
<b>transparent</b>	an object which allows light to pass through it so that objects behind it can be easily seen (glass).
<b>periscope</b>	An apparatus consisting of a tube of attached to a set of mirrors or prisms through which an observer can see things that are otherwise out of sight.
<b>prism</b>	when light passes through a different object and its direction changes.
<b>rainbow</b>	an arch of colours visible in the sky, caused by the refraction and dispersion of the sun's light by rain or other water droplets in the atmosphere.
<b>ray</b>	a beam of light given off by a light source.
<b>reflection</b>	the throwing back by a body or surface of light, heat or sound without absorbing it.
<b>refraction</b>	the bending of light as it passes from one substance to another with the bending caused by the difference in density between two substances.
<b>shadow</b>	a dark area or shape produced by a body coming between rays of light and a surface.
<b>spectrum</b>	a band of colours, as seen in rainbows, produced by separation of the components of light by their different degrees of refraction.