Prior Knowledge

What you should know.

Light is needed in order to see things
Dark is the absence of light
Light is reflected from surfaces.
Light from the sun can be dangerous and there are ways to protect the eyes.
Shadows are formed when the light from a light source is blocked by an opaque object.
The size of shadows change.
Materials can be grouped according to their properties, including transparency.

Vocabulary Dozen

concave	A lens or other object curved inwards so the centre is thinner than the outside.
convex	Curved outwards like the surface of a sphere, so its middle is thicker than its edges
diffusion	The scattering of light.
dispersion	The splitting of white light into the seven colours of the visible spectrum - rainbow.
opaque	Does not allow light to travel through – cannot be seen through.
prism	A prism is a triangular block of glass or Perspex which splits light into its constituent colours.
reflection	Change in direction of light when it meets a reflective surface.
refraction	The change in direction of light waves when a wave passes from one transparent medium to another
translucent	A material allowing some light to pass through it. This light is scattered so you cannot see clearly through the material.
transparent	A material that allows all light to pass through it. This material is see-through.
visible spectrum	The wavelengths of light visible to the eye.
wavelength	The distance between two peaks of a wave (of light).

Did you know?

A light year is not a measure of time but o measure of distance. A light year is the distance that light travels in empty space in one year – about 10 trillion kilometres.

OAK CLASS

Light

Science

Light

Light appears to travel in straight lines, and we see objects when light from them goes into our eyes.
The light **may** come **directly** from **light sources**, but for other objects some light must be **reflected** from the object into our eyes.

Shadows

Objects that block light (are not fully transparent) will cause shadows. Because light travels in straight lines the shape of the shadow will be the same as the outline shape of the object.

Sunlight

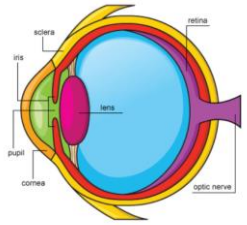
Light is travels extremely **fast**. Light travels at **300,000 kilometres** per **second.**
The Sun is approximately 150,000,000 kilometres from Earth.
That means it takes a little over 8 minutes for light from the Sun to reach Earth.
NEVER look directly at the Sun as the light from the Sun is powerful enough to permanently damage the eyes.

Key Scientists

Sir Isaac Newton - In 1666, Newton made a discovery about light that led him to develop his Theory of Colour, a theory that still informs our understanding of light today. He placed a prism in front of ray of light, and his observations were incredible.
Galileo Galilei was an Italian scientist who developed a number of scientific discoveries. One of them was the creation of a telescope that was thirty times the magnification of other telescopes. He used his telescope to look at many of the planets and discovered four of the largest moons that were orbiting around Jupiter. These four moons were called 'Galilean satellites'.

The Human Eye

Light enters the body through the eyes.
The eye is covered at the front by the cornea – a transparent coating.



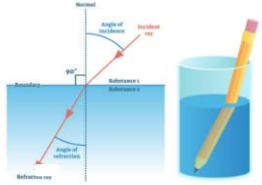
The iris is the coloured part of the eye. It controls the amount of light that can enter the by opening and closing the pupil.
Light enters the eye through the pupil. If there is a lot of light, the pupil gets smaller. When there is less light, the pupil will get bigger.
The lens focuses light onto the retina at the back of the eye. The retina sees this light image upside down.
The retina sends the light images to the optic nerve.
The optic nerve sends the images it receives to the brain where they are processed.

Travelling Light

Reflection

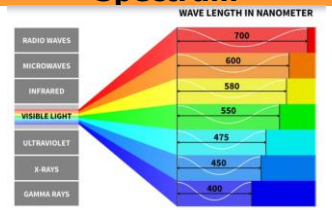
When light from an object is **reflected** by a surface, it changes direction. It bounces off the surface at the same angle as it hits it. Smooth, shiny surfaces such as mirrors or polished metals reflect light well. Dull and dark surfaces such as dark fabrics do not reflect light well.

Refraction



Refraction is the bending of light. Light bends whenever it travels from one **transparent** material to another. The reason light bends when it passes between two materials is because it changes speed. If the new material is more dense the light slows down and bends towards the normal.

Spectrum



We can only see light with a certain range of **wavelengths** and frequency. This range is called the visible **spectrum**. When light is **refracted** it can be **dispersed** into the individual colours of the visible **spectrum**. The order of the colours is: red, orange, yellow, green, blue, indigo, violet. An easy way to remember this is the colourful man

Transparent, Translucent & Opaque

Transparent materials allow light to travel through them. Light travels directly through a **transparent** material although it may become **refracted**. When light travels through a **translucent** material, the light is **diffused** – it does travel directly and not all light passes through. It is only possible to **partially see through** translucent materials. **Opaque** materials do not allow any light to pass through them. When light meets an opaque material, the light is blocked and shadow is formed.