Knowledge Organiser

Light and Perception

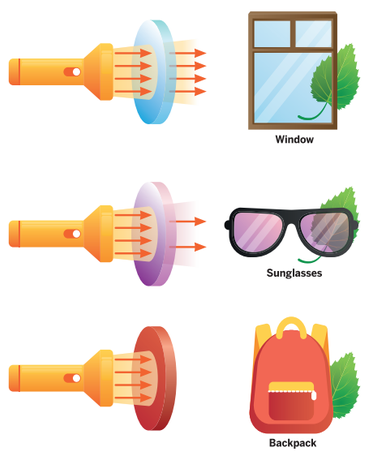
Glossary

1	**angle of incidence**	the angle between a ray of light and the normal ray	11	**optic nerve**	takes electrical signals from our eye to our brain
2	**angle of reflection**	the angle between the reflected ray of light and the normal ray	12	**prism**	a triangular piece of glass that splits light into the seven colours of the visible spectrum
3	**cone cells**	a part of the eye that helps us to see colour	13	**reflected ray**	the light ray reflected back from a surface
4	**glare**	too much background light	14	**refraction**	the bending of light that occurs when light travels through an object
5	**incident ray**	the light ray that goes towards a surface	15	**rod cells**	a part of the eye that helps us to see in the dark
6	**law of reflection**	when light is reflected the angle of incidence is equal to the angle of reflection	16	**shielding**	covering light so it is directed down instead of up reducing light pollution
7	**light pollution**	the unnecessary use of light especially outdoors	17	**skyglow**	reflected light and upward-directed light escaping up into the sky. This brightens the sky
8	**light trespass**	unwanted light that spills into an area	18	**vacuum**	a space where all the air particles have been removed like outer space
9	**light wave**	an electromagnetic wave which travels in a straight line	19	**visible spectrum**	made up of seven colours: red, orange, yellow, green, blue, indigo, and violet
10	**normal ray**	the normal ray is perpendicular to a surface — e.g. it hits the surface at 90° and is also reflected at 90°	20	**wave frequency**	each colour of the visible spectrum has a different frequency so they bend differently

How are shadows formed?

Shadows are formed by blocking light.

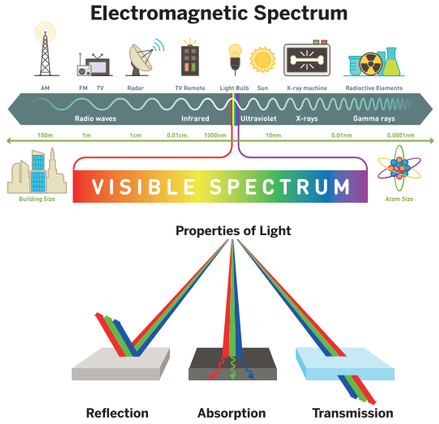
- A brighter light source forms a clearer, more defined shadow.
- Opaque objects create clear shadows.
- Translucent objects create unclear shadows.
- Transparent objects cannot create shadows.
- The size and shape of a shadow depend on the position and size of the light source compared to the object.



What colour is light?

Isaac Newton discovered that clear white light is made up of 7 colours.

- The visible light spectrum is the part of the electromagnetic spectrum that the human eye can see.
- Light waves can be absorbed, transmitted or reflected to create colour.
- Objects that absorb all wavelengths of light and reflect no colours create black.
- Some objects do not absorb any visible wavelengths of light and reflect all the colours to create white.



How does light move?

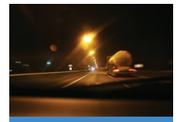
Light moves slowly through materials denser than air, like water.

- Light changes direction when it travels through transparent materials.
- Refraction is when light slows down and changes direction causing objects to appear bent or distorted.

What is light pollution?

Light pollution is the unnecessary use of light.

- There are 3 types of light pollution:


glare


light trespass


sky glow

- Ecosystems are disrupted by light pollution.
- Light trespass can cause health problems like sleep disorders.
- Shielding lights properly can reduce light pollution.

How does the human eye help us to see?

Light is reflected off objects into our eyes. The human eye is a complex organ.

- Light enters through the pupil and passes through to the retina.
- The rods and cones of the retina change the light into electrical signals.
- The optic nerve takes the electrical signals from the eye to the brain.