



# LIGHT KNOWLEDGE ORGANISER

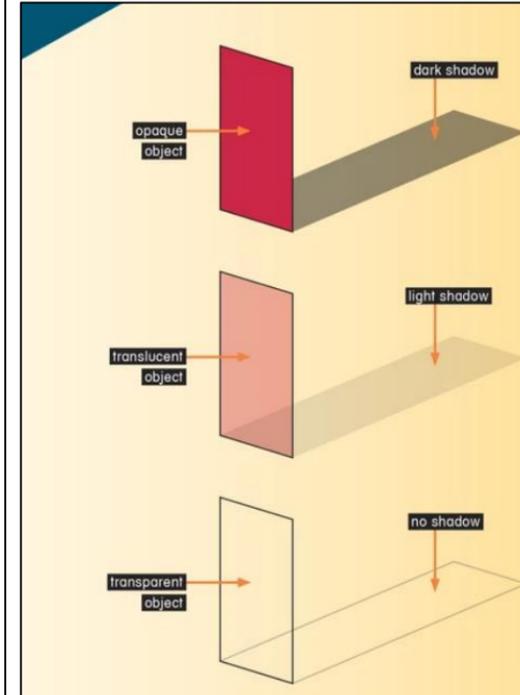


## What you should already know...



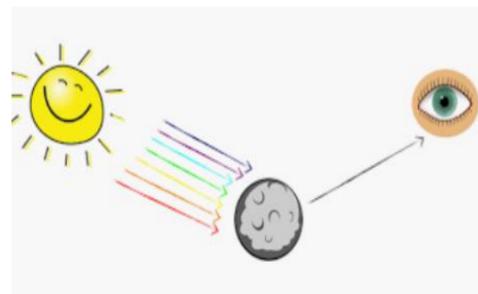
- Light is a form of energy that makes it possible to see.
- Light is given off some objects (for example the Sun). Darkness is the absence of light.
- Light can reflect off surfaces (e.g. mirrors). Light is absorbed by other materials.
- Objects can be labelled as transparent, translucent, or opaque, depending on the amount of light that they let through.
- Shadows are formed when light is blocked by an opaque object.

## How Light Travels



- Light originates from light sources.
- Light sources can be natural (e.g. The Sun, the stars) or man-made (e.g. street lamp, Christmas tree lights, glow stick, mobile phone, TV).
- Light travels in a straight line from light sources.
- We can see that light travels in straight lines when we shine a torch in a dark room, or when a ray of light comes through a window.
- When an object passes in front of a ray of light, the light can be blocked, creating a shadow.
- Opaque objects let no light through (creating the darkest shadows), translucent objects let some light through (creating fainter shadows), and transparent objects let all light through (no shadow).

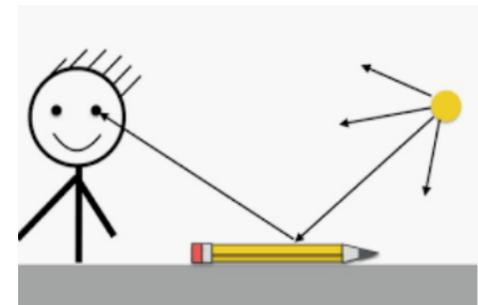
## How We See Things



- We see things because...
  - a.) they are a light source, sending light into our eyes, or
  - b.) light is reflected from a light source off them and into our eyes.

When the light enters our eyes, we see the object!

- For example, we see The Sun because it is a light source, sending light into our eyes.

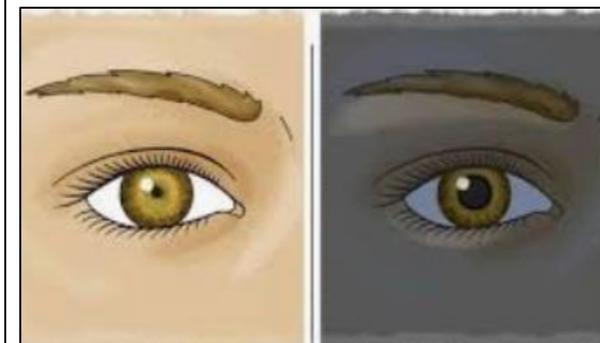


- However, The Moon is not luminous (does not produce its own light). We see it because light from The Sun reflects off it into our eyes.

- After light reflects off objects, it continues to travel in a straight line, but in a new direction.

## Our Eyes

Our eyes have a small window at the front called a pupil, through which light can enter. The pupil looks as though it is black because it is dark inside our eyes.



- When it is dark, our pupils go larger, in order to let more light in so that we can see better. In bright lights, our pupils go smaller.
- At the back of our eye is a sensitive sheet of nerves called a retina. They can detect light when it comes in through the pupil, and send messages to the brain about what we can see.

## Light Spectrum

Red

Orange

Yellow

Green

Blue

Indigo

Violet



# Light – Vocabulary



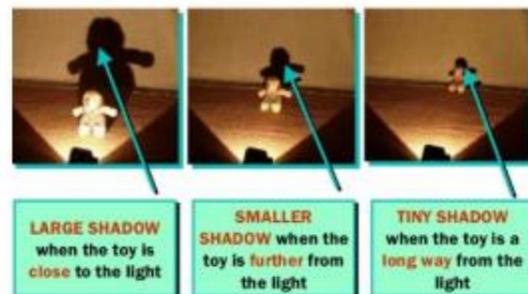
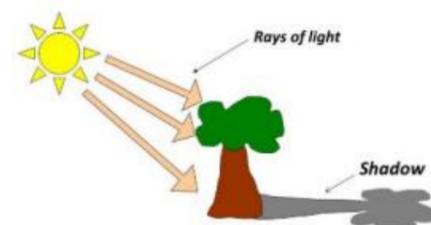
absorb	to take in or soak up
angle	the direction from which you look at something
dark	the absence of light
dim	light that is not bright
electricity	a form of energy that can be carried by wires and is used for heating and lighting, and to provide power for machines
emits	to emit a sound or light means to produce it
light	a brightness that lets you see things
luminous	gives off light or shines
mirror	a flat piece of glass which reflects light, so that when you look at it you can see yourself reflected in it
opaque	if an object or substance is opaque, you cannot see through it
reflects	sent back from the surface and not pass through it
shadows	a dark shape on a surface that is made when something stands between a light and the surface
source	where something comes from
surface	the flat top part of something or the outside of it
torches	a small electric light which is powered by batteries and which you can carry
translucent	if a material is translucent, some light can pass through it
transparent	if an object or substance is transparent, you can see through it

## The relationship between light sources and shadows

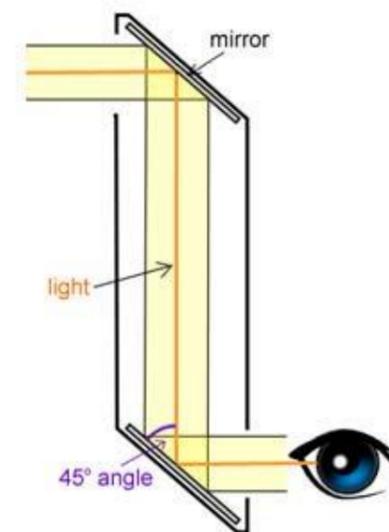
Light travels in straight lines, when there is an opaque object blocking the light, a shadow is formed.

- These shadows have the same shape as the objects that cast them.

- The size of a shadow changes as the light source moves.



## Periscopes



A simple periscope is just a long tube with a mirror at each end. The mirrors are fitted into each end of the tube at an angle of exactly 45 degrees (45°) so that they face each other.

In the periscope, light hits the top mirror at 45° and reflects away at the same angle. The light then bounces down to the bottom mirror. When that reflected light hits the second mirror it is reflected again at 45°, right into your eye. You can see this in the picture on the right.

Light is always reflected away from a mirror at the same angle that it hits the mirror.