KNOWLEDGE ORGANISER

KEY CONCEPTS

- Dark is the absence of light.
- Light is reflected off surfaces.
- Light travels in straight lines.
- Shadows form when the light is blocked. The straight line of rays cannot bend around objects.
- Light from light source travels from the source, to objects, to our eyes.
- Light is a form of energy.
- Most light comes from the sun.
- Light travels at 186,000 miles per second.
- It takes eight minutes for light to travel from the sun to the Earth.
- White light is made up of different colours of light mixed together.
- We see the moon because light reflects off it.

REFLECTION

- Light bounces off surfaces and is scattered. For example, a piece of paper is full of microscopic irregularities (bumps), meaning that when light hits it, it bounces off in many different directions (like throwing bouncy balls at the floor).
- Some light will be absorbed instead of reflected.
- Nearly all solid material surfaces scatter or reflect light.
- Solid materials that absorb most of the light falling on them are black.
- When light hits a polished surface with fewer imperfections (a mirror), light is scattered less and usually reflects at the same angle as it hit.

PRIMARY AND SECONDARY SOURCES.

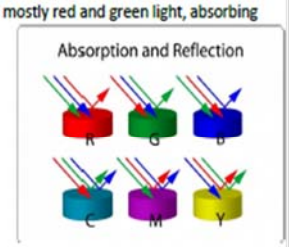
- Primary source: gives out light - light bulbs, the sun, candles.
- All primary sources converts a kind of energy into light energy. EG. candles turn chemical energy from candle wax into light and heat energy. In a light bulb, electrical energy is converted into light and heat energy.
- Light energy is usually paired with heat energy.
- Secondary source: reflects light - walls, tables, people.

HOW LIGHT TRAVELS

- Light travels quickest through a vacuum. Slightly slower through air, and slower still through liquids.
- Light from a light source travels in all directions. Only a little of this light goes straight into the eye. This is why light sources can look exceptionally bright.
- The rest of the light reflects off secondary sources and eventually, some of it finds its way to our eyes.

COLOUR

- Light has three primary colours: blue, red, green.
- When all three combine, they make white.
- In different proportions and combinations, they make different colours.
- When we see a blue ball, it is because the ball absorbs the red light and some of the green, reflecting mostly the blue.
- When we see a yellow daffodil, the flower reflects mostly red and green light, absorbing most of the blue.



Light Waves

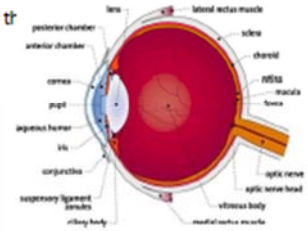
- Light waves are transverse waves, like ripples in water.

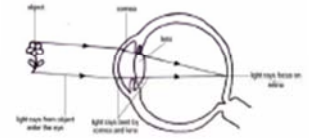
Amplitude: tells you how bright the light is. A higher amplitude means a brighter light.

Frequency: the frequency of a wave (or its wavelength) determines its colour.

EYES

- Light falls on the retina at the back of the eye.
- The retina sends tiny electrical impulses to the brain.
- The brain interprets the electrical impulses and builds a picture.
- Cones detect different colours of light (red, blue and green light).
- Signals from the cones tell the brain what colour things are.
- Sometimes, cones don't work properly, or the brain doesn't interpret them properly, which is th





- The pupil is a small hole in your eye.
- When too much light tries to enter, it gets smaller.
- When it is dark, your pupil will get larger to let more light in.
- This is the same mechanism as the aperture on a camera.
- The pupil cannot reflect light so it looks black. Red-eyes on a photograph are caused when the flash reflects off the blood cells on the retina.