

# Learn to Light:

**Light Waves** Light travels in a straight line as a light wave. Light can travel through empty space (a vacuum) unlike sound which needs a medium like air or water. Light will continue to travel in a straight line until it hits something or travels through one medium to another. When this happens light is absorbed, reflected (bounces off), scattered (bounces off in lots of directions), refracted (changes speed and direction) or transmitted (passes straight through).



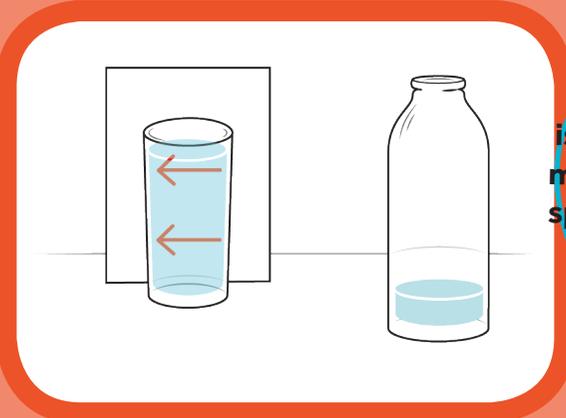
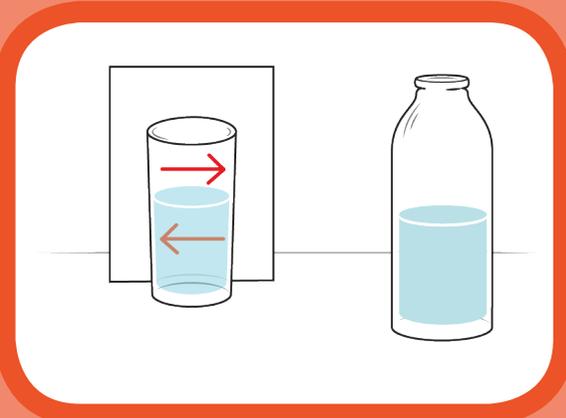
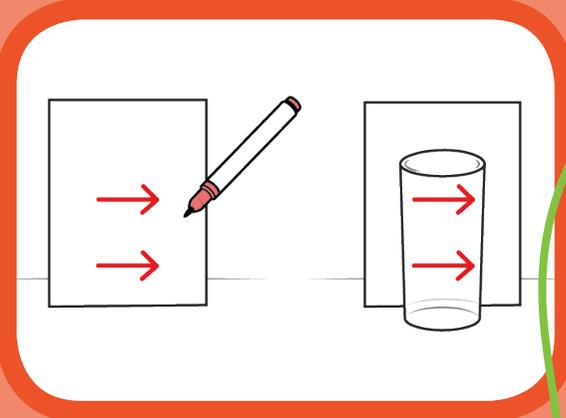
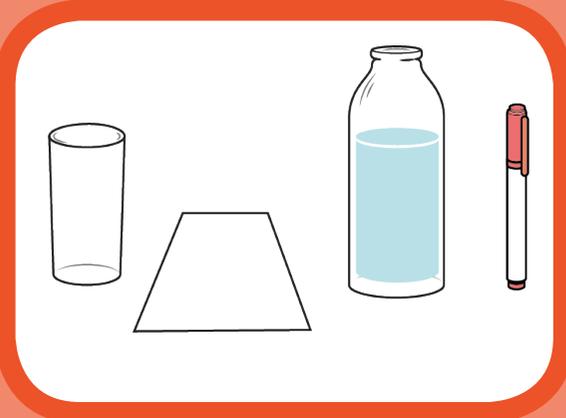
## Experiment

### Optical Illusion

You will need:

A clear glass, some water, a piece of paper/card, a pen

1. Draw two arrows one above the other, with both arrows pointing to the right of your card. Place the card behind your glass so you can see the arrows through the side of the glass.
2. Half fill the glass with water or until it covers the first arrow. What do you notice?
3. Now fill the glass to the top with water so the second arrow is covered. What has changed this time?



## FUN FACTS

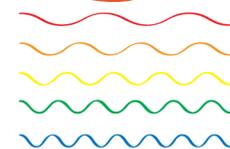
Light takes about 8 minutes and 20 seconds to reach the Earth from the Sun. When we see the Sun, we are seeing what it looked like over 8 minutes ago.

The speed of light equals 300,000 km/second. Nothing else travels faster than light, not even sound!



A light-year is how astronomers measure distance in space. It's defined by how far a beam of light travels in one year – a distance of six trillion miles.

Each colour of light in the rainbow has a different length of 'wave'.



## Findings

What changed when you added the water



If you look from the side what can you see



What happens when you drink the water and put the glass back



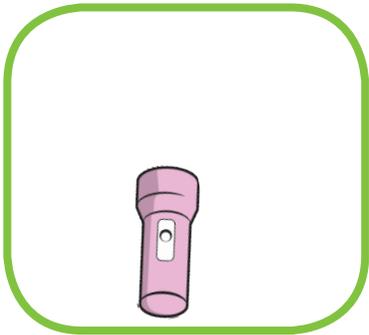
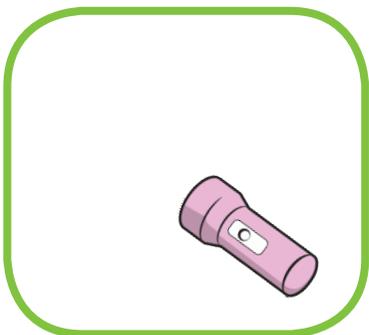
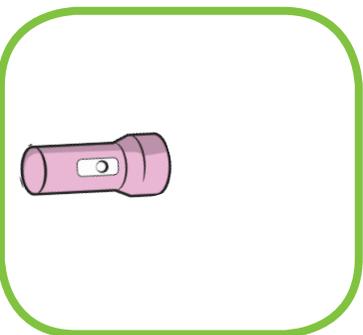
**What moves faster than anything else in the world?**

# Learn to Light:

**Conclusion** Light can travel through air, water and transparent materials/ objects. If a material is transparent it means light can completely pass through it. Some materials only let some light through - we call these materials translucent or semi-transparent. Materials that let no light through are called opaque. Light travels at different speeds through different mediums and materials.

How does light travel?

Draw how the light will travel from each torch...

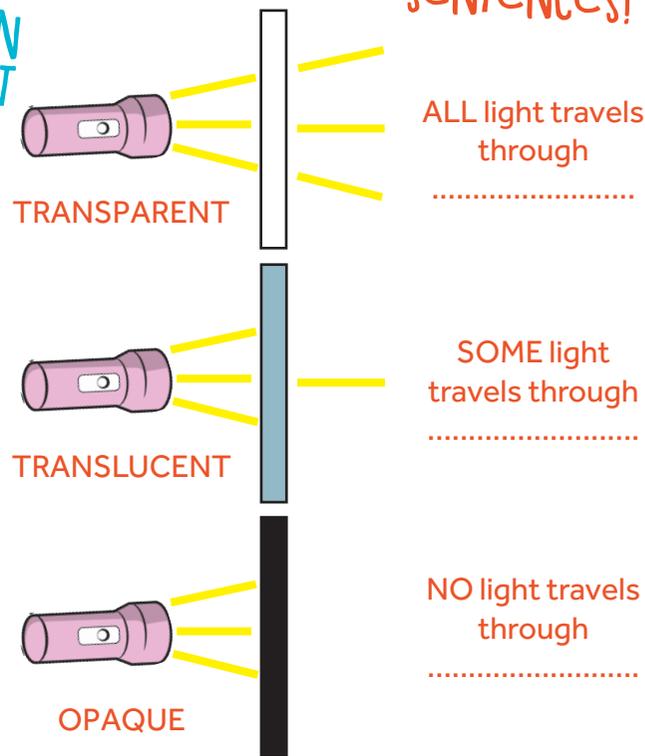


AN OPTICAL ILLUSION IS SOMETHING THAT PLAYS A TRICK ON YOUR VISION (YOUR EYES AND YOUR BRAIN). WHAT YOU SEE IS DIFFERENT FROM REALITY.



A straw in a glass of water looks like it is broken or bent because light travels more slowly through water than air... this is refraction. Put a straw in a glass of water and try looking at it from different angles. What do you see?

CAN YOU COMPLETE THE SENTENCES?



Using a torch test different materials in the house to find one of each and write them down.

Grown-ups: If you don't have time to search the house testing different materials and are looking for a one-stop shop for some quick examples of transparent, translucent and opaque materials then plastic wrap/cling film, baking paper and tin foil are good examples.

Answers: FINDINGS - the arrows look like they have changed direction, the arrows haven't changed direction, the arrows change back HOW LIGHT TRAVELS - in a straight line STRAW sometimes it looks broken and sometimes bent SENTENCES - examples would be: plastic wrap, baking paper, tin foil.