



Post-activity Resources

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Introduction

This post-visit material has been designed to help you follow up your Techniquest activity. It includes an outline of the show, and suggested follow-up questions to help clarify your pupils' understanding of the topic.

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Light & Sound Show Summary

Light

1. Sources of light
2. Reflecting light
3. White light → coloured light
4. Coloured light → white light
5. Lasers and optical fibres
6. Ultra-violet light

Sound

1. Vibrations
2. How sounds travel
3. Seeing sound wave patterns
4. Making quiet sounds louder

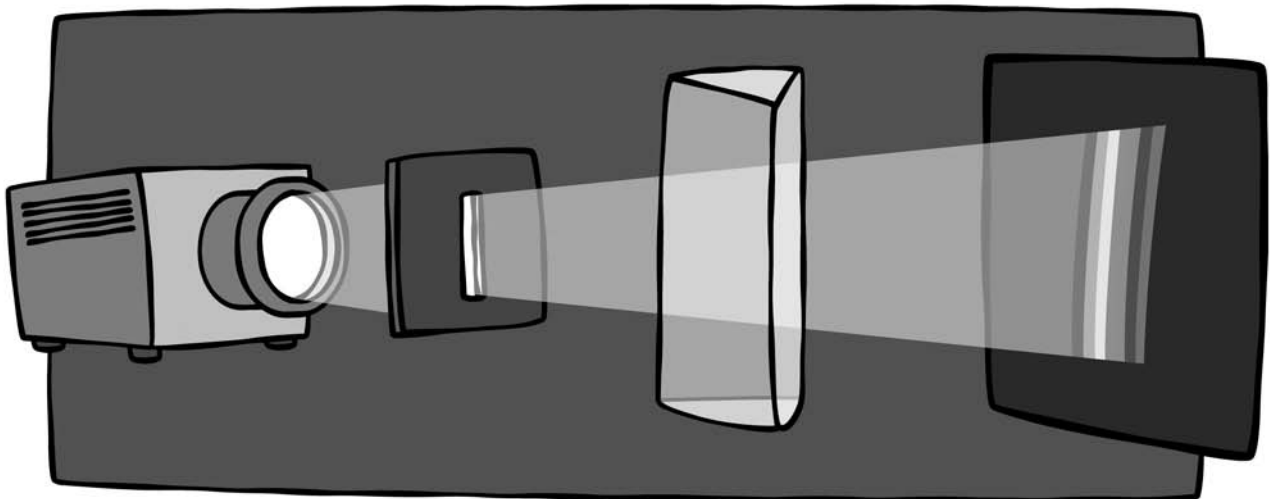
Questions for classroom discussion

Some people think that light is all around us, just like air. Is that true?

Light travels from a source. When the lights are turned off and there is no other source of light, you will not be able to see anything, it will be totally dark. If you light a candle or switch on an electric bulb, the light from that source will travel outwards in all directions and some of it will enter our eyes. When the light reaches our eyes, the eyes send a message to the brain and we are then able to see the light source.



How can we get coloured light?

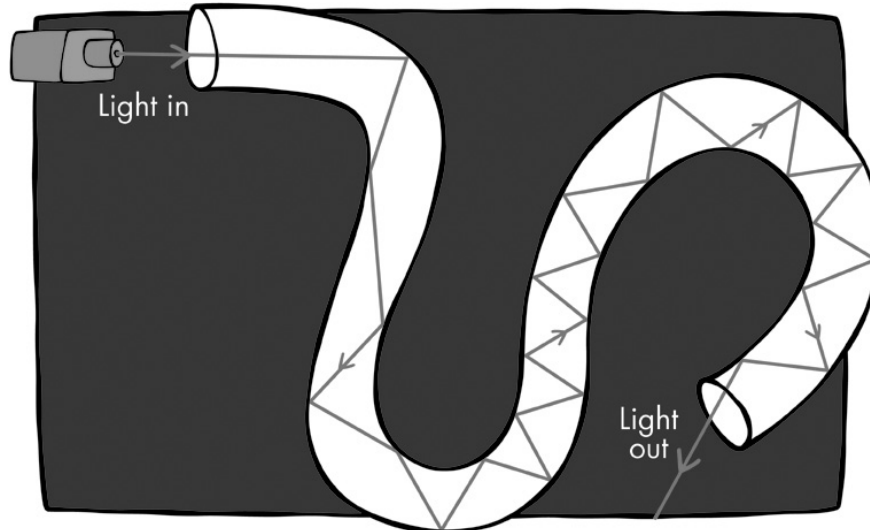


White light → coloured light

When we shine light through a prism, the white light is split up into the different colours of the spectrum. We can also see white light split up into its colours in a rainbow, and on oily puddles, bubbles and CDs.

How does a light shine through a bendy optical fibre?

How does light travel?



Light travels in straight lines.

Light travels in straight lines so the light has to zigzag through the optical fibre. It is reflected off the inside of the optical fibre.

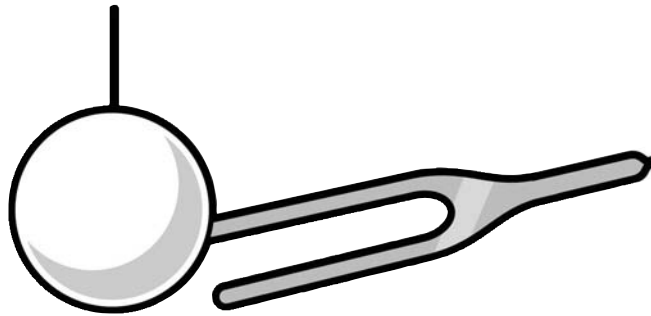
How can you protect yourself from ultra-violet light?

Ultra-violet (UV) light comes from the sun and is damaging to our bodies. Sunscreen protects our skin by stopping the UV light getting to it. Clothing also makes a barrier between the UV light and our skin.

- washing liquid has a chemical in it which makes our clothes glow 'whiter than white' when we go out into the sunlight
- tonic water and some plastics glow in UV light.



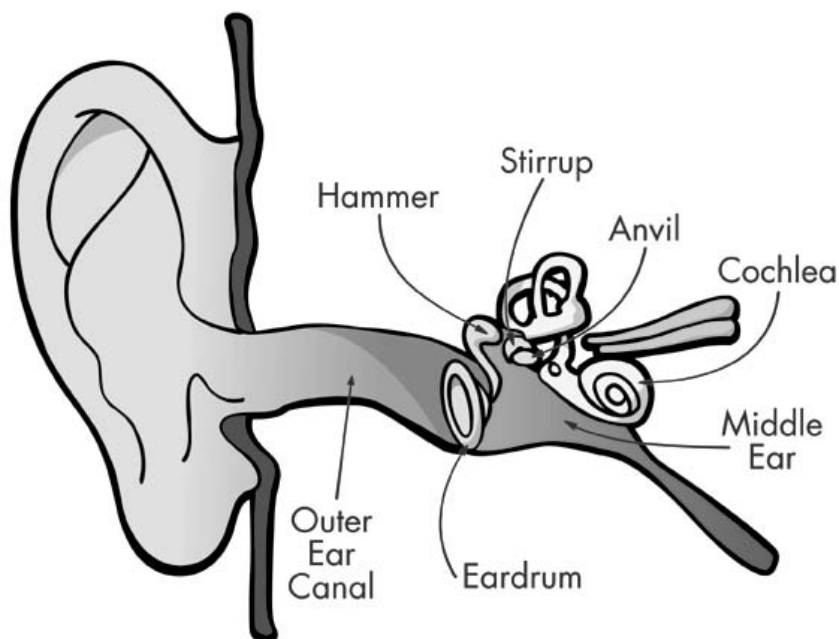
How are sounds made?



Sounds are made when something vibrates. The tuning fork vibrates very quickly, so it is difficult to see it moving. When we put the tuning fork next to a suspended table tennis ball, the vibrations make the table tennis ball jump away.

(A vibrating tuning fork put into water will pass on the vibrations to the water, causing splashes).

How do we hear sounds?



The human ear contains a stretched membrane, the eardrum. When the air close to the eardrum vibrates, the eardrum also starts to vibrate. This makes the three bones in the ear, the hammer, anvil and stirrup, vibrate. The vibrations are passed to the cochlea where nerves send messages to the brain.

How do sounds reach our ears?

Sounds will only reach our ears if there is something for the vibrations to travel through. There has to be some material between the source and your ear. This is usually air but could be any solid, liquid or gas.

Sounds can travel through:

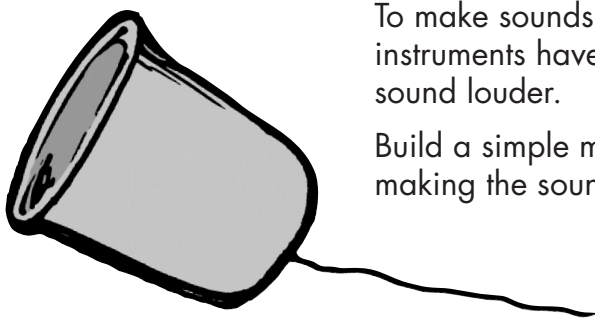
A solids, e.g. in Western films where people put their ear to the ground to listen for horses' hooves.

B liquids, e.g. if you are swimming underwater you can hear many sounds which travel to you through the water. Many sea creatures rely on sound travelling through water to communicate.

C gases, e.g. for us to hear each other speaking, the vibrations of our voice box cause the air in our throat to vibrate. This vibration is passed through the air until the vibration reaches the other person's ear. The eardrum vibrates to pass the message on to the brain.



How can we make sounds louder?



To make sounds louder, we need to make more air vibrate. Musical instruments have sound boxes or similar to amplify or make the sound louder.

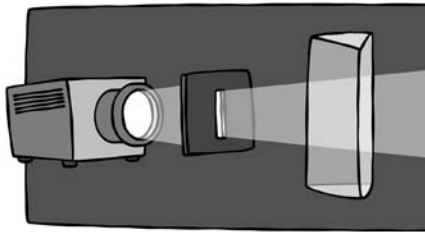
Build a simple musical instrument and find a way of amplifying or making the sound louder.

Lightwork

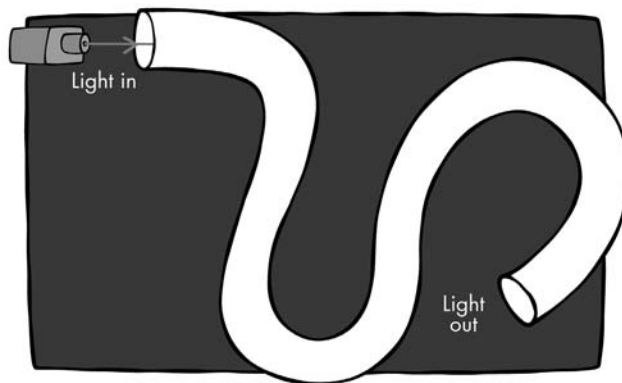
1. Draw four sources of light

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2. Draw what you would see on the screen.



3. Show how the laser light travels through the curly optical fibre. Remember light travels in straight lines, so use a ruler!



4. How can you protect yourself from ultra-violet light?



Soundcheck

1. Draw four sources of sound

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2. Complete this sentence:
 Sounds are made when something _____

3 Why can't sound travel on the Moon?



4 How can I make these sounds louder?

