

YEAR 4: SOUND SCIENCE:

UNDERSTAND, DESCRIBE AND EXPLAIN:

	vibrate		sound	I	louder		ctors	tines	cochlea
	vibration		volume		string		су	Tuning fork	
Learning links:	vibrating		pitch	pe	rcussion	Finger board		Wind instrument	:
	air	mediun	n faint	brass	fret	guiro	pinna	stirrup	
	ear		fainter	wo	woodwind		Sound wave		
Pupils should be	hear		loud	in	insulate		rument		

taught to:

Identify how sounds are made, associating some of them with something vibrating

Recognise that vibrations grom sounds travel through a medium to the ear

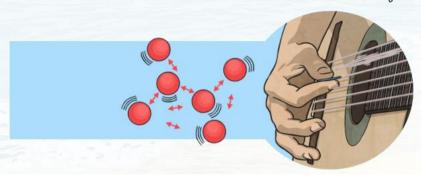
Find patterns between the pitch of a sound and geatures of the object that produced it

Find patterns between the volume of a sound and the strength of the vibrations that produced it.

Recognise that sounds get gainter as the distance grom the sound source increases

How Sound is Made

- Like light, sound travels through the air in waves.
- · Sound is made by air molecules vibrating.
- · When you clap your hands, the air around your hands shakes. This is the air molecules vibrating.





When air molecules inside the ear vibrate, they shake tiny hairs on the insides of the ears.

The hairs are connected to nerves under the skin.

Molecules Vibrating

These nerves send messages to your brain to tell you that you heard a noise.

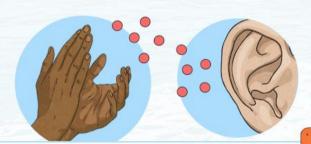


Communicating with the brain

Sounds are made when objects vibrate. The vibration makes the air around the object vibrate and the air vibrations enter your ear. You hear them as sounds.

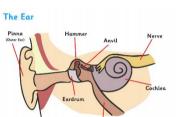
You cannot always see the vibrations, but is something is making a sound, some part of it is always vibrating

The vibration of the air molecules around the hands shake the molecules next to them and so on, until the air molecules in the ear are vibrating.



Have you ever gelt a speaker when the sound is on?

It vibrates.



THINKING POINT:

HOW IS SOUND SIMILAR TO LIGHT?

EXPLORE AND INVESTIGATE:

Sound needs molecules to move. It is impossible for sound to travel

in space.

Sound doesn't have to move through air. It can travel through water or metal.

In fact, sound travels faster through water and solids than it does through air.







Sound travels much slower than light, whether in air or in water.

You often hear things after you see them, for example you see the lightning before you hear the thunder.

Light travels at 186,000 miles per second. Sound travels at 770 miles per hour.











THINKING POINT:

How are the vibrations from a loud sound

different from the

vibrations of a soft sound?

Whenever we talk about sound and pitch, we're talking about if the sound is a high sound or a low sound.

For example, if we described a regeree's whistle being blown, you could say it has a high pitch because the sound makes a high screeching sound.

If we described a large drum being beaten, you could say it has a low pitch because the sound makes a low thudding sound.



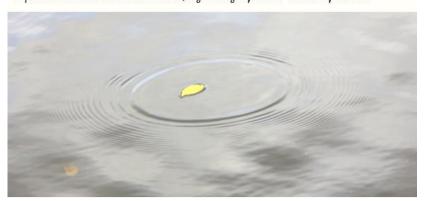
Sounds get quieter as the distance between the sound source and your ear increases.

Sounds travel as vibrations. As the sound waves travel, the particles of whatever they are travelling through vibrate, or move quickly on the spot. The further the vibrations travel, the more they spread out. As they spread out through more and more particles, the vibrations become smaller and smaller. This causes the sound to get quieter and quieter.

Think of dropping a leaf into a pond. The very first ripples directly around the leaf will be very large, but as the ripples spread out across the pond, they will get smaller and smaller until eventually they disappear.

This is why sounds get quieter and quieter as you move further away from the source, until you eventually can't hear the sound at all.

You can see the ripples getting smaller as they spread out across the pond, until they eventually disappear. This is like the way the vibrations of sound get smaller as they spread out over distance, getting quieter and quieter.



Sounds also get quieter over distance because some of the vibrations are absorbed by obstacles they meet.

If the ripples in the pond below hit an obstacle such as a stick or rock, they would not travel as far. This can help you understand why sounds get quieter as you move further away.



Telephones are used to transmit the sound of people's voices over long distances.

When you speak into a telephone, the sound energy in your voice is turned into electrical energy, which is transported down a wire to the other person's telephone. The electrical energy is converted back into sound energy, and they can hear what you are saying!



HYPOTHESISE ENQUIRE TEST RECORD REPORT CONCLUDE



What to Do

- Fill your bottle about half full of water using the pouring jug take care not to spill it!
- Now with the metal spoon, strike the side of the bottle and listen to the sound that you hear come out of the top of the bottle.

 How would you describe that sound?

High pitched or low pitched?

- 3 Using the same bottle fill it up a little further, about % full.
 - Now strike the bottle again using the metal spoon, and listen carefully to the sound that you get this time

Here's What's Happening...

When you strike the bottle, you are causing vibrations and this is what causes sound.

When the bottle is almost pull, the glass vibrates slowly. This is because as the vibrations travel, the water slows them down.

When the bottle is only half gull, the glass is able to vibrate much quicker. This is because there is less water to slow the vibrations down.

This makes a low pitch.

This makes a high pitch.

Experiment with the water and you'll see that you can make all sorts of sounds and even maybe play a tune!

KEY ASSESSMENT AND APPLICATION OPPORTUNITIES:

EXS:

1. Explain why some sounds are high and others low?

GDS:

I. What conclusions can you draw from the fact whales can communicate over hundreds of miles?