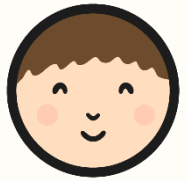
Science

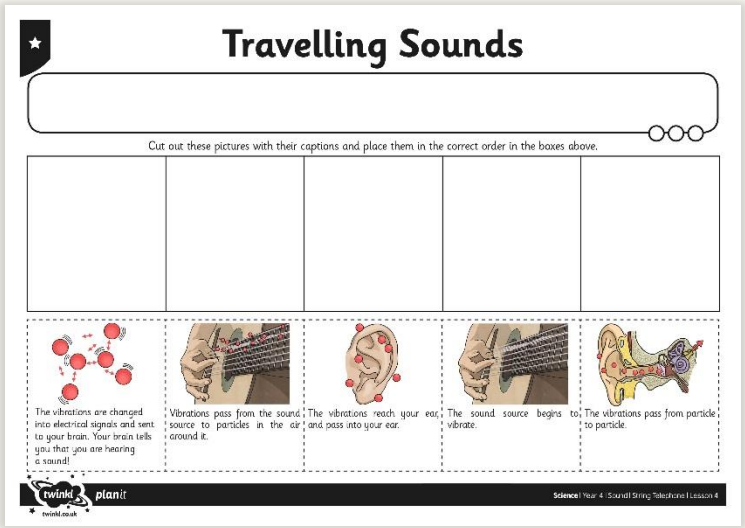
Sound

Travelling Sounds



Today you will be finding out about how sounds change as they travel. But how do they travel?

Can you cut and stick the pictures on the Travelling Sounds Activity Sheet to show how sounds travel?



Travelling Sounds

Cut out these pictures with their captions and place them in the correct order in the boxes above.

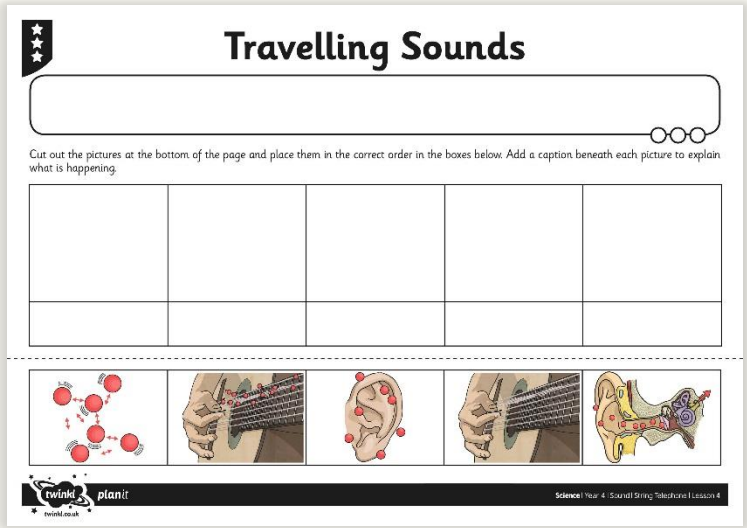
The vibrations are changed into electrical signals and sent to your brain. Your brain tells you that you are hearing a sound!

Vibrations pass from the sound source to particles in the air around it.

The vibrations reach your ear and pass into your ear.

The sound source begins to vibrate.

The vibrations pass from particle to particle.



Travelling Sounds

Cut out the pictures at the bottom of the page and place them in the correct order in the boxes below. Add a caption beneath each picture to explain what is happening.

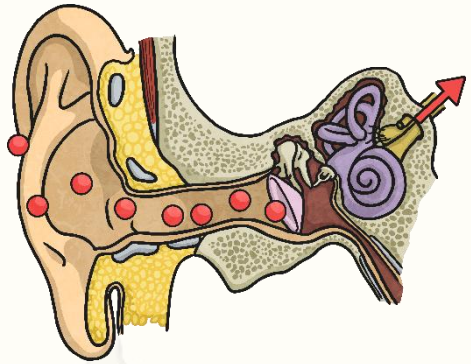
Travelling Sounds

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.



Travelling Sounds

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.

Travelling Sounds

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.

Sound over Distance

Whole Class

Try this investigation to explore how sounds change over distance.

Sit near to a ringing alarm clock and think about how loud it sounds. Then move one metre away and again listen to how loud it is. Continue moving away one metre at a time, stopping each metre to listen to how loud the alarm sounds.

Have a game of "Guess the distance" with people in your household. Use a blindfold and ask people to guess the distance of the ringing alarm clock from them.

Who is closest at guessing the distance? Did anyone get it exactly right?

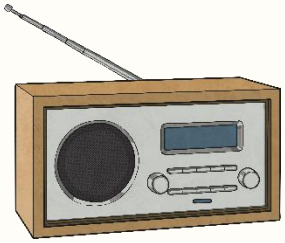
Sound over Distance

We know that vibrations spread out and get smaller as they travel, making sounds quieter as we move further away from the source of the sound. But often people need to be able to hear sounds from far away.

Can you think of any devices that transmit sound over a distance, or ways of making sounds louder so that they travel further?

Phone

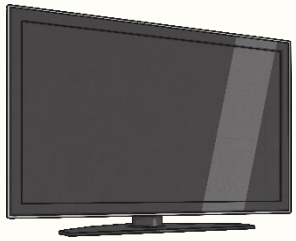
Microphone



Radio

Walkie Talkie

Putting hands around



Television

Telephone Transmission

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

When you speak into a land-line 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!

Your challenge today is to create a string telephone that will transmit the sound of your voice over a distance.

Telephone Transmission

You and a family member should stand far apart from each other.

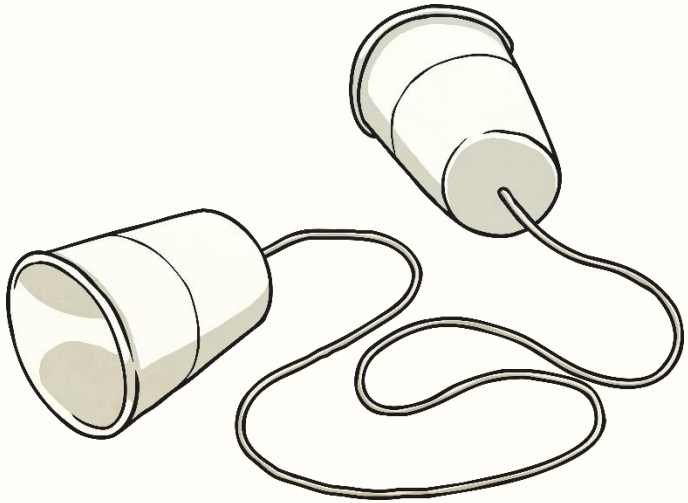
Use your normal speaking voice to try to talk to each other. Make sure that you can't hear each other!

Can you explain why you can't hear each other?

Telephone Transmission

The vibrations from the sound of your voice cannot continue moving as far as the other person's ear. The vibrations get smaller and stop before they reach them.

Use 2 paper cups and string or wool to construct a string telephone.



Stand the same distance apart as you did earlier. Use your telephone to speak to each other. (The speaker talks into their cup and the listener puts their cup to their ear.) Remember to use your normal speaking voice and keep the string or wool taut (pulled tight). You should be able to hear each other now!

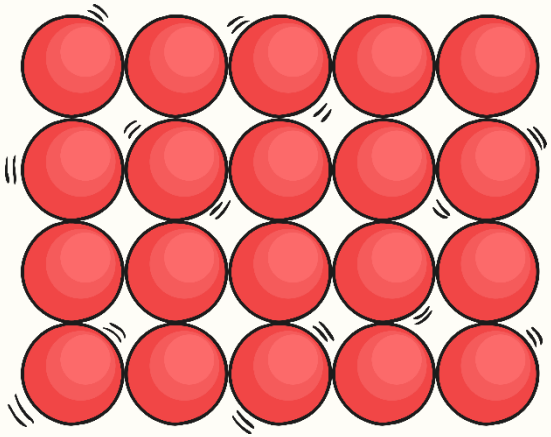
Telephone Transmission

How does your telephone work?

The string and the cups are solid, so the particles are much closer together than the particles in the air, which is a gas.

The sound energy can travel from particle to particle far easier in the solid string telephone, so the sound of your voice is louder over the same distance than it was in the air.

Solid Particles



Gas Particles