LO: Recognise that vibrations from sounds travel through a medium to the ear.

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Experiment Time

The classic paper cup and phone experiment

What do you think we are investigating?

What are we going to do?

Will it work?

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Experiment Time

The classic paper cup and phone experiment

Equipment:

1. 2 paper cups
2. Long string,
3. A sharp pencil or needle to poke holes in the cups
4. Scissors

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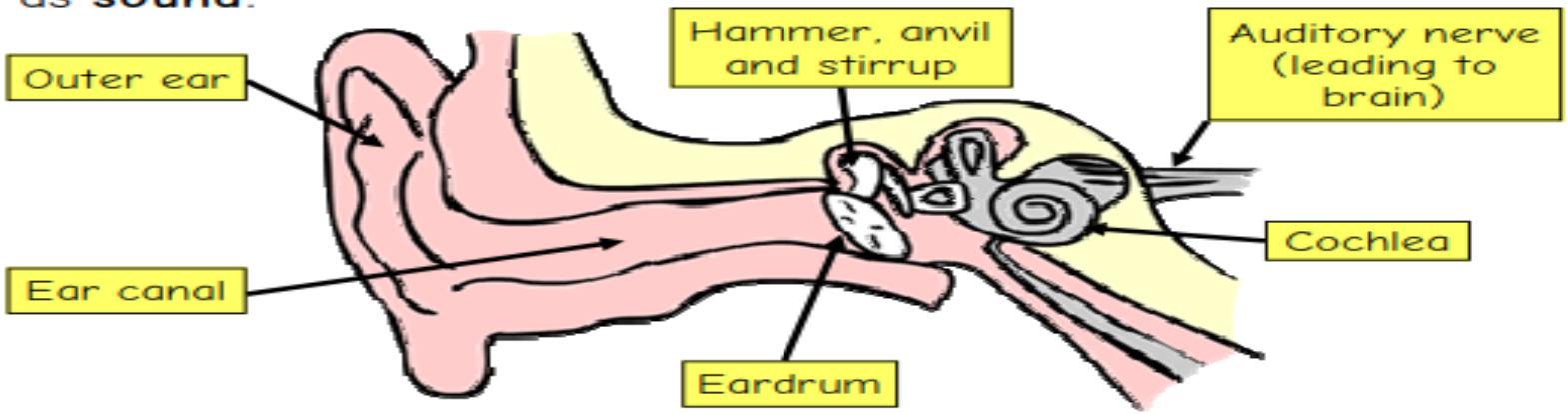
Hearing Sounds

How our ears work

When a sound wave reaches our ear, our **outer ear** (the part that we can see on the side of our heads) funnels the sound into our heads down the **ear canal**. At the end of the ear canal is the **eardrum**, which is waterproof and airtight. Past the ear canal is the **middle ear**. Inside the middle ear are the **hammer**, **anvil** and **stirrup** (the three smallest bones in the body) which vibrate and pass the sound waves to the **inner ear**, which contains the **cochlea**, which turns the vibrations into **electrical signals**. These signals travel down the **auditory nerve** to the **brain**, which experiences the signal as **sound**.



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Loud and Quiet

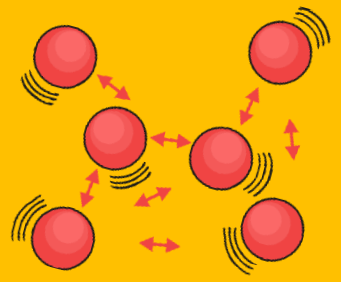
Try this mini investigation to find out if the vibrations change when the loudness of the sound changes.

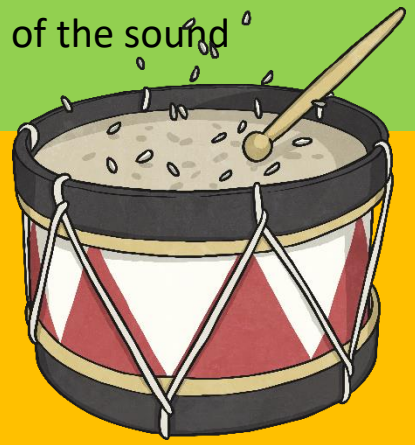
Place some rice on the skin of a drum.

Bang the drum three times: gentle, medium and hard.

Observe the way the rice vibrates each time.

Is there a link between the loudness of the sound and the size of the vibrations?





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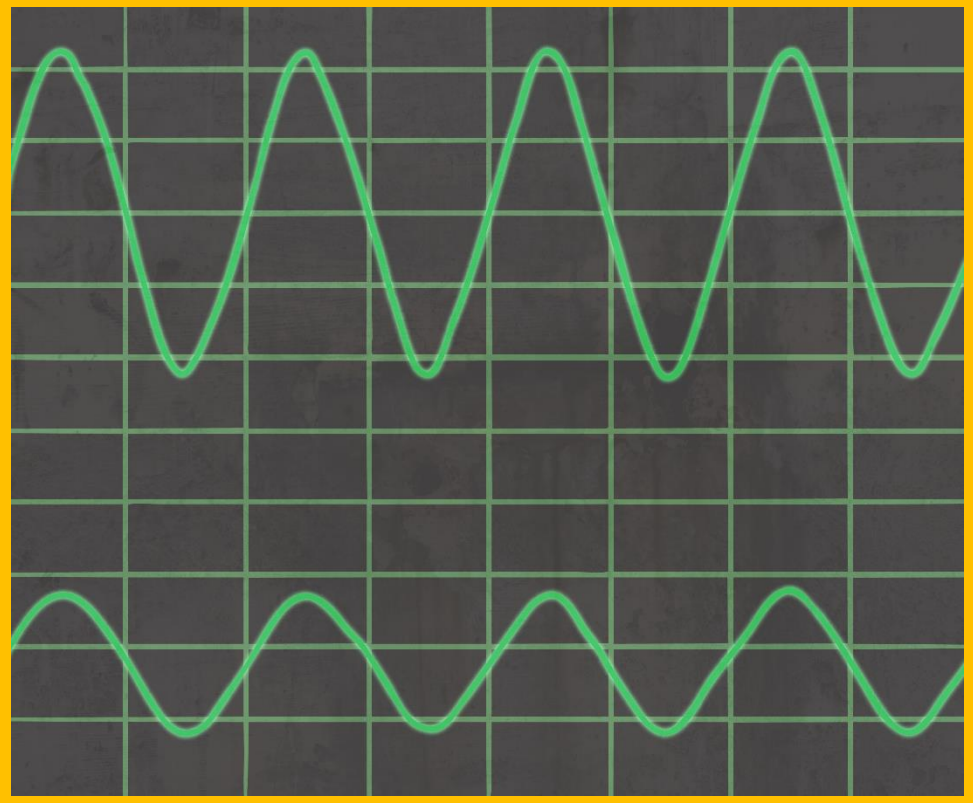
Loud and Quiet

The louder the sound, the bigger the vibration. You should have noticed that the rice grains vibrated more when you hit the drum harder, creating a louder sound.

The size of the vibration is called the amplitude.

Quieter sounds have a smaller amplitude, and louder sounds have a bigger amplitude.



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How Does Sound Travel

So we know that sounds are caused by vibrations, and the louder sounds have bigger vibrations.

But how do these different sounds reach our ears?

These children have been talking about their ideas.

What do you think of their ideas?

I think sound can travel through the air because the air is lighter and easier to get through than solids or liquids.

Sound moves the air from the source of the vibration into our ears. If we are listening, we will hear the sound.

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How Does Sound Travel

Watch this clip to see if you can identify how different sounds travel.

Click on this image to play the video in a new window.

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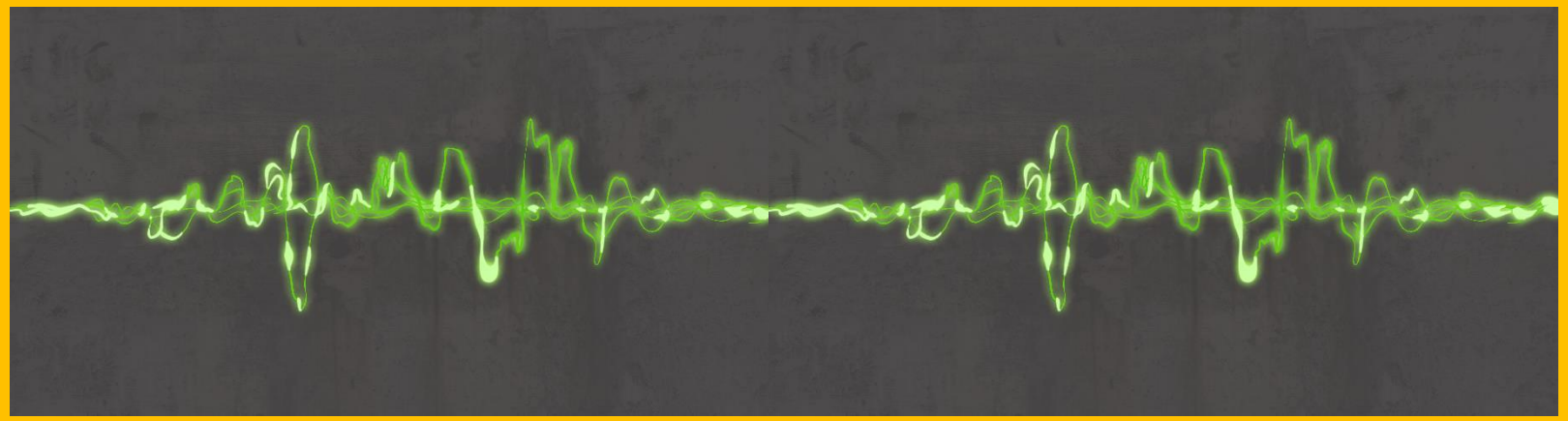
How Does Sound Travel?

Sound can travel through solids, liquids and gases.

Sound travels as a wave, vibrating the particles in the medium it is travelling in.



So in our example, when you hit the drum, the drum skin vibrated. This made the air particles closest to the drum start to vibrate as well. The vibrations then passed to the next air particle, then the next, then the next. This carried on until the air particles closest to your ear vibrated, passing the vibrations into your ear.