




# Sound: Hearing Sounds

<p><b>Aim:</b> To identify how sounds are made, associating some of them with something vibrating, by performing a dramatisation of how sounds travel.</p> <p>To find patterns between the volume of a sound and the strength of the vibrations that produced it, by performing a dramatisation of how sounds travel.</p> <p>To recognise that vibrations from sounds travel through a medium to the ear, by performing a dramatisation of how sounds travel.</p> <p>I can explain how different sounds travel.</p>	<p><b>Success Criteria:</b> I can describe how vibrations make sounds. I can explain how vibrations change when a sound gets louder. I can explain how loud and quiet sounds travel to our ears.</p>	<p><b>Resources:</b> <a href="#">Lesson Pack</a> Rice Drum per pair A camera to film the children's performances - if required</p>
	<p><b>Key/New Words:</b> Vibration, amplitude, loud, quiet, travel, wave, particles, ear.</p>	<p><b>Preparation:</b> Differentiated <a href="#">Science of Sound Activity Sheet</a> - per child</p>

**Prior Learning:** Children will have learnt about sounds and vibrations in lesson 1.

## Learning Sequence

	<p><b>Vibrations:</b> Children discuss what is vibrating in each picture on the <a href="#">Lesson Presentation</a> to make a sound. Remind children of the demonstration of vibrations using rice on a drum from lesson 1. <b>Look for children who can recall and explain how sounds are created by vibrations, and can identify what is vibrating to cause a sound.</b></p>	
	<p><b>Loud and Quiet:</b> Children conduct the mini investigation described on the <a href="#">Lesson Presentation</a> to find a link between the size of the vibrations and the loudness of a sound. Discuss and explain their findings. <b>Look for children who observe and explain that the bigger the vibration, the louder the sound, and vice versa.</b></p>	
	<p><b>How Does Sound Travel:</b> Children discuss the ideas about sound travelling on the <a href="#">Lesson Presentation</a>. Children explore the process of hearing the sound of clapping hands. Explain this further using the information on the <a href="#">Lesson Presentation</a>, clarifying any misconceptions.</p>	
	<p><b>Hearing Sounds:</b> Explain how the ear works and how we hear sounds using the information and diagram on the <a href="#">Lesson Presentation</a>.</p>	
	<p><b>The Science of Sound:</b> Explain the context of the task described on the <a href="#">Lesson Presentation</a>. Children work in groups to create and perform a factual programme to explain how different sounds travel. Children use the differentiated <a href="#">Science of Sound Activity Sheet</a> to plan their programmes, then practise acting them out. You may wish to film the children performing their programmes, or you may want them to present their programmes to the class or another audience. <b>Look for children who are able to explain that sound travels as vibrations that pass from particle to particle. Look for children who can explain how the loudness of the sound changes as the size of the vibrations changes.</b></p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div data-bbox="215 1503 528 1619">  <p>Use the prompts, examples and key words to plan their programmes.</p> </div> <div data-bbox="619 1503 967 1581">  <p>Use the prompts and examples to plan their programmes.</p> </div> <div data-bbox="1018 1503 1385 1581">  <p>Use the prompts to plan their programmes.</p> </div> </div>	

## Taskit

- Researchit:** Using different sources, research 'Evelyn Glennie' to find out about how she can 'hear' sounds through vibrations, even though she is deaf. Create a fact file about her life, her music and her rise to fame as an acclaimed percussionist.
- Makeit:** Create a 3D model of the ear using clay, mod rock or modelling clay. Can you add labels or an explanation of how the ear enables us to hear sounds?
- Exploreit:** Investigate which travels quicker: light or sound. Pour some flour into a deflated balloon, then carefully blow the balloon up (an adult should do this!) Go outside into the playground. Hold the balloon while the children stand some distance away. Pop the balloon while the children watch, and ask them which they noticed first, the sight of the flour bursting out or the sound of the balloon popping. Explain that light travels faster than sound, which is why they may have been able to see the flour before hearing the pop.

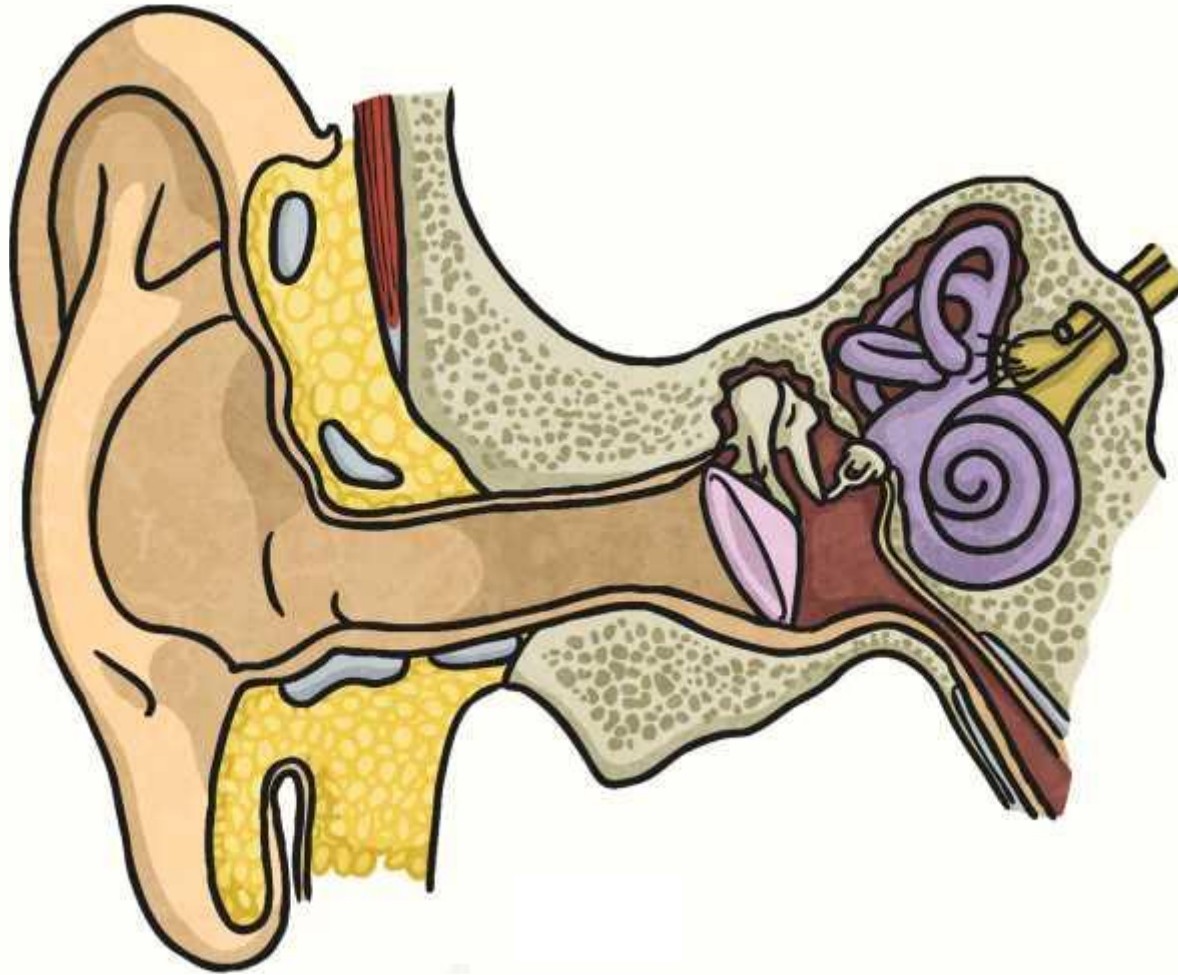


# Science

## Sound



# Hearing Sounds



A decorative border surrounds the page, featuring illustrations of various musical instruments at the top and bottom: a red and white drum, an acoustic guitar, a brass instrument (possibly a tuba or euphonium), a pan flute, and a CD. On the left and right sides, there are vertical lines of musical notes, including a treble clef and various note values.

## Aim

- I can explain how different sounds travel.

## Success Criteria

- I can describe how vibrations make sounds.
- I can explain how vibrations change when a sound gets louder.
- I can explain how loud and quiet sounds travel to our ears.



# Vibrations



Sounds are made when something vibrates.

Talk to your partner about what is vibrating in each of these pictures to make a sound.



# Vibrations

By placing rice on a drum, you can see the vibrations when you hit the drum, as well as hearing the sound.



# Loud and Quiet



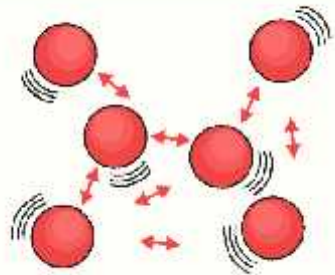
Try this mini investigation to find out if the vibrations change when the loudness of the sound changes.

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?



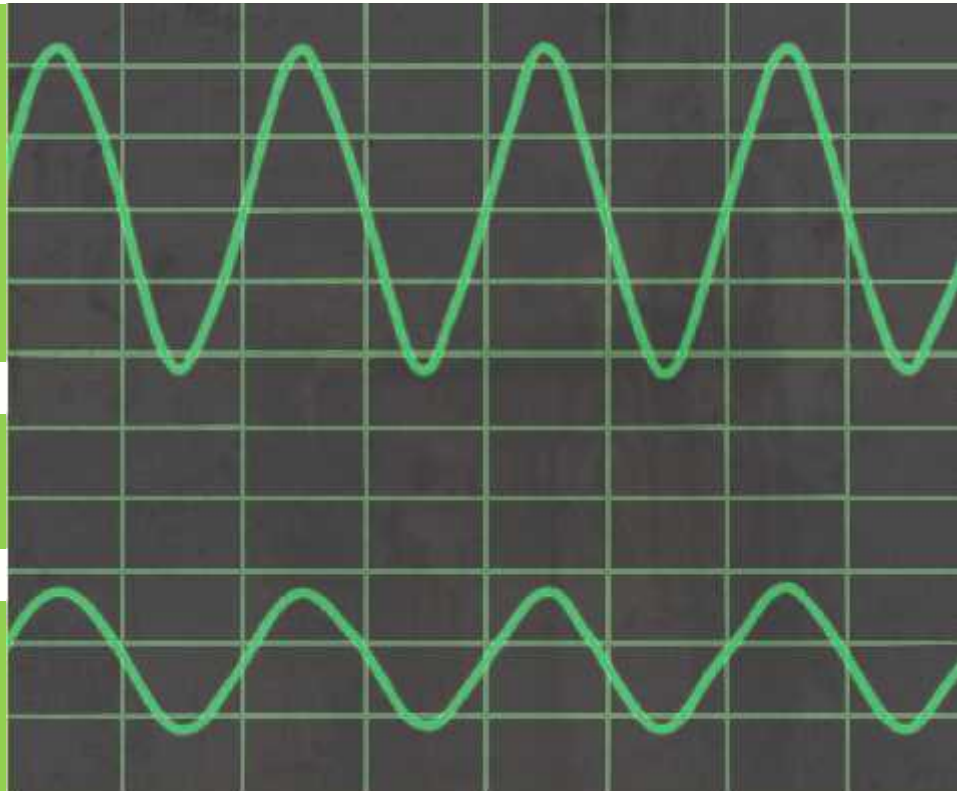


# Loud and Quiet

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.





# 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.

# How Does Sound Travel?



Sound is all about vibrations!

When particles vibrate or collide with one another, they create sound.

When we clap our hands, the air particles around our hands vibrate and collide with other particles. This results in a wave of vibrations travelling through the air to the eardrum, which in turn also vibrates.

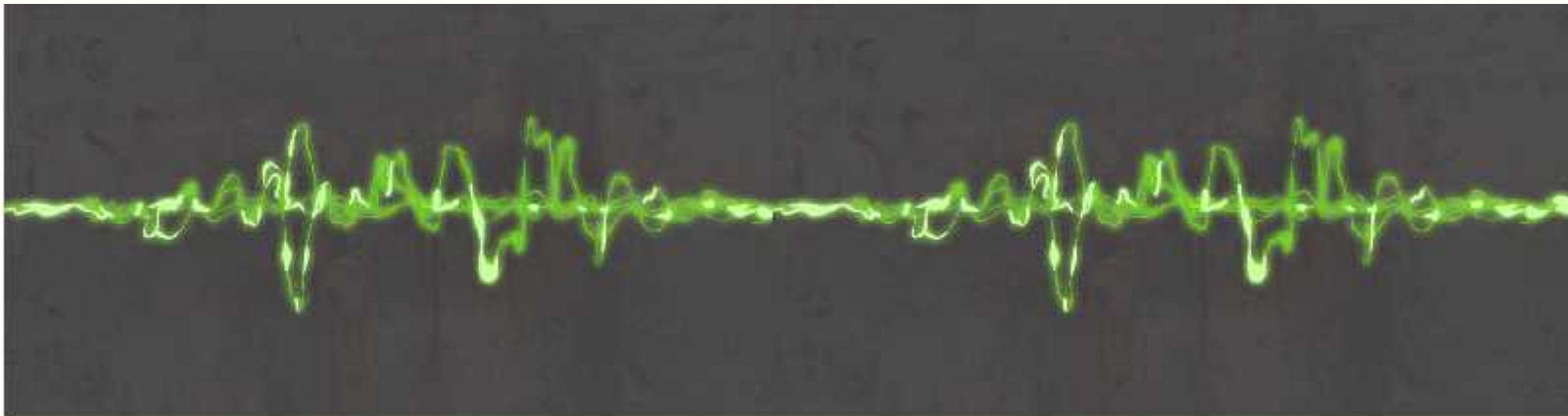


The sound that is heard in the eardrum will depend on a number of factors, including what medium the sound is travelling through and how strong the initial sound vibrations from the clap were.

# 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.

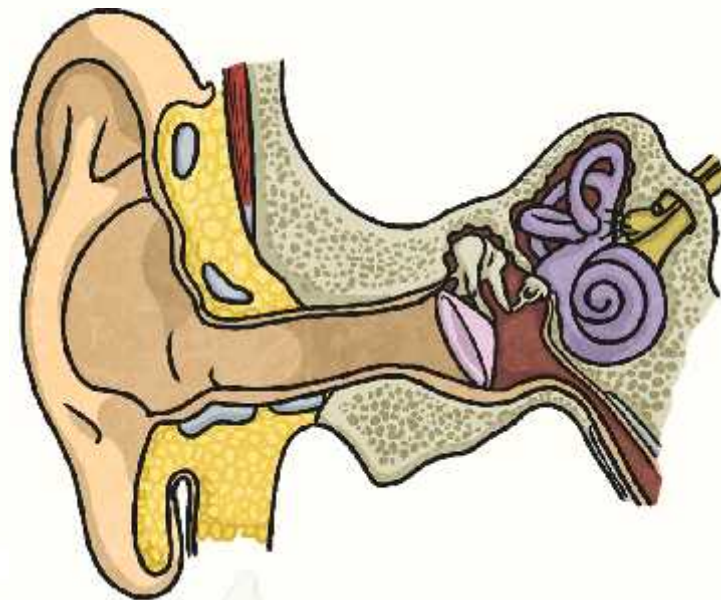


So in our example, when you hit the drum, the drum skin vibrated. This made the air particles closest to the drum start to vibrate as well. The vibrations then passed to the next air particle, then the next, then the next. This carried on until the air particles closest to your ear vibrated, passing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

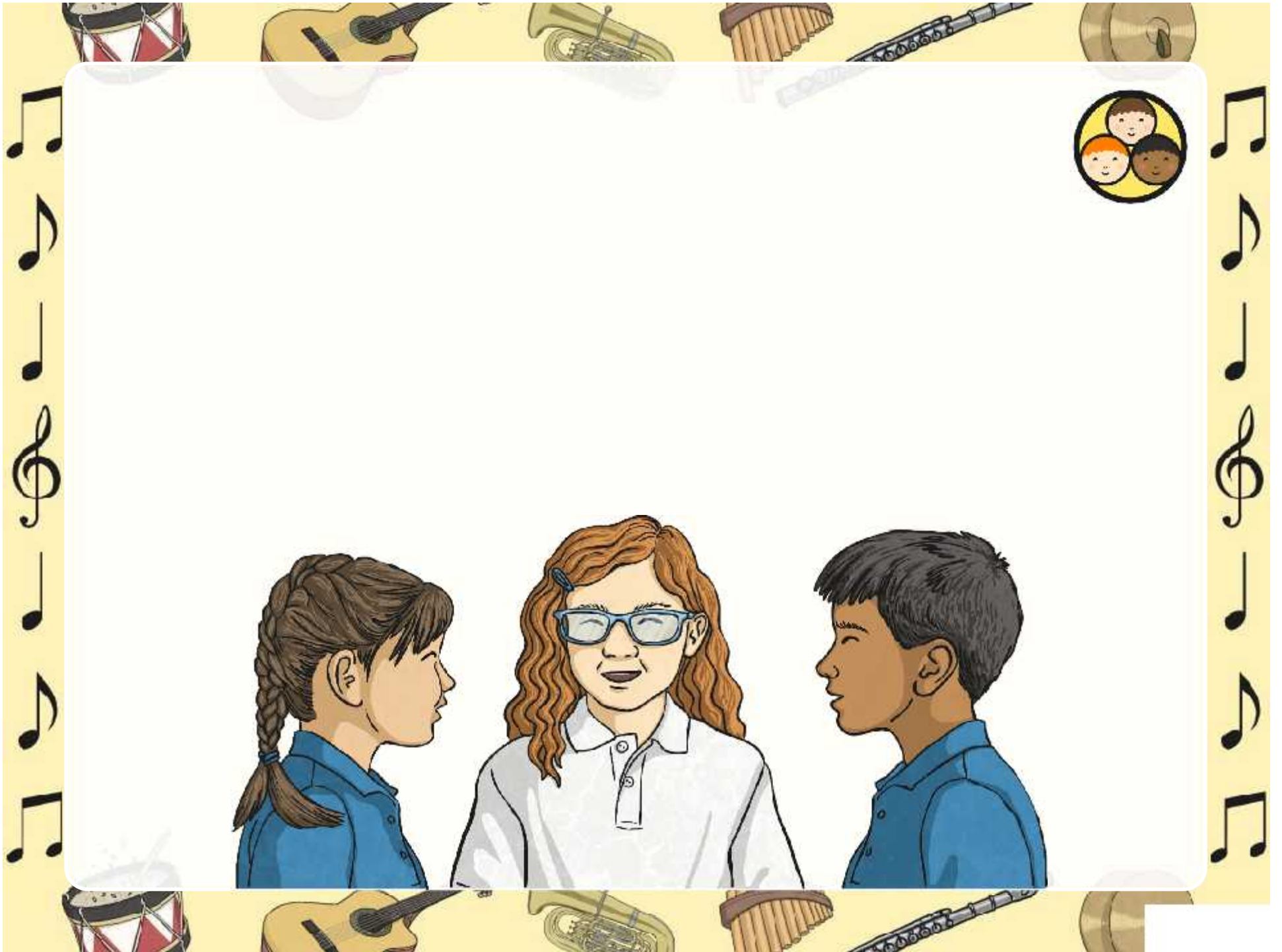


# Hearing Sounds

Once in your ear, the vibrations travel into the ear canal until they reach the eardrum. The eardrum passes the vibrations through the middle ear bones (the hammer, the anvil and the stirrup) into the inner ear. The inner ear is shaped like a snail and is called the cochlea. Inside the cochlea, there are thousands of tiny hair cells. Hair cells change the vibrations into electrical signals that are sent to the brain through the hearing nerve. The brain tells you that you are hearing a sound and what that sound is.







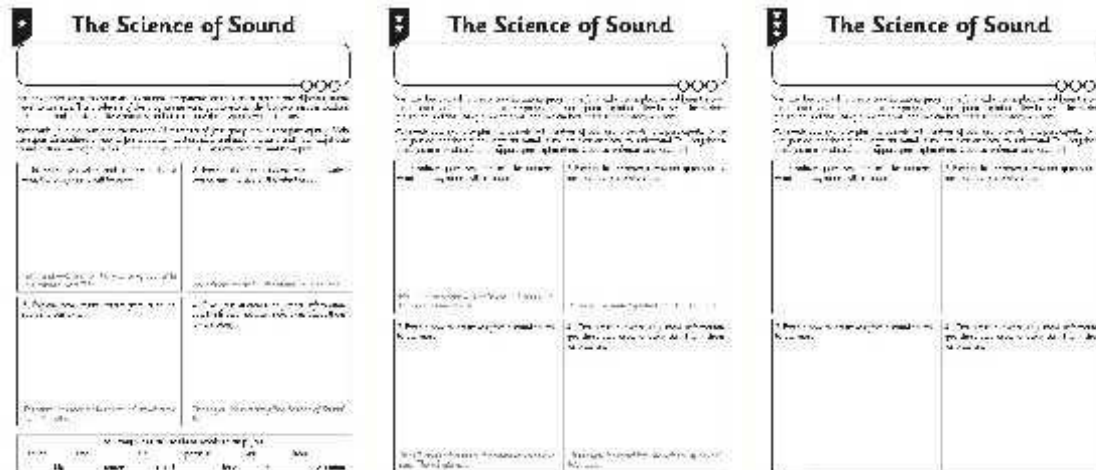
# The Science of Sound



Use the ideas that we've discussed today, or you could alter the ideas, to come up with your own way of dramatising and explaining how different sounds travel for the programme.

Use The Science of Sound Activity Sheet to plan your ideas and then practise what you will do and say. Make sure your explanations are clear and easy for children to understand. Have fun and get into character!

You may film your programmes, or you may perform them to your class or another audience.





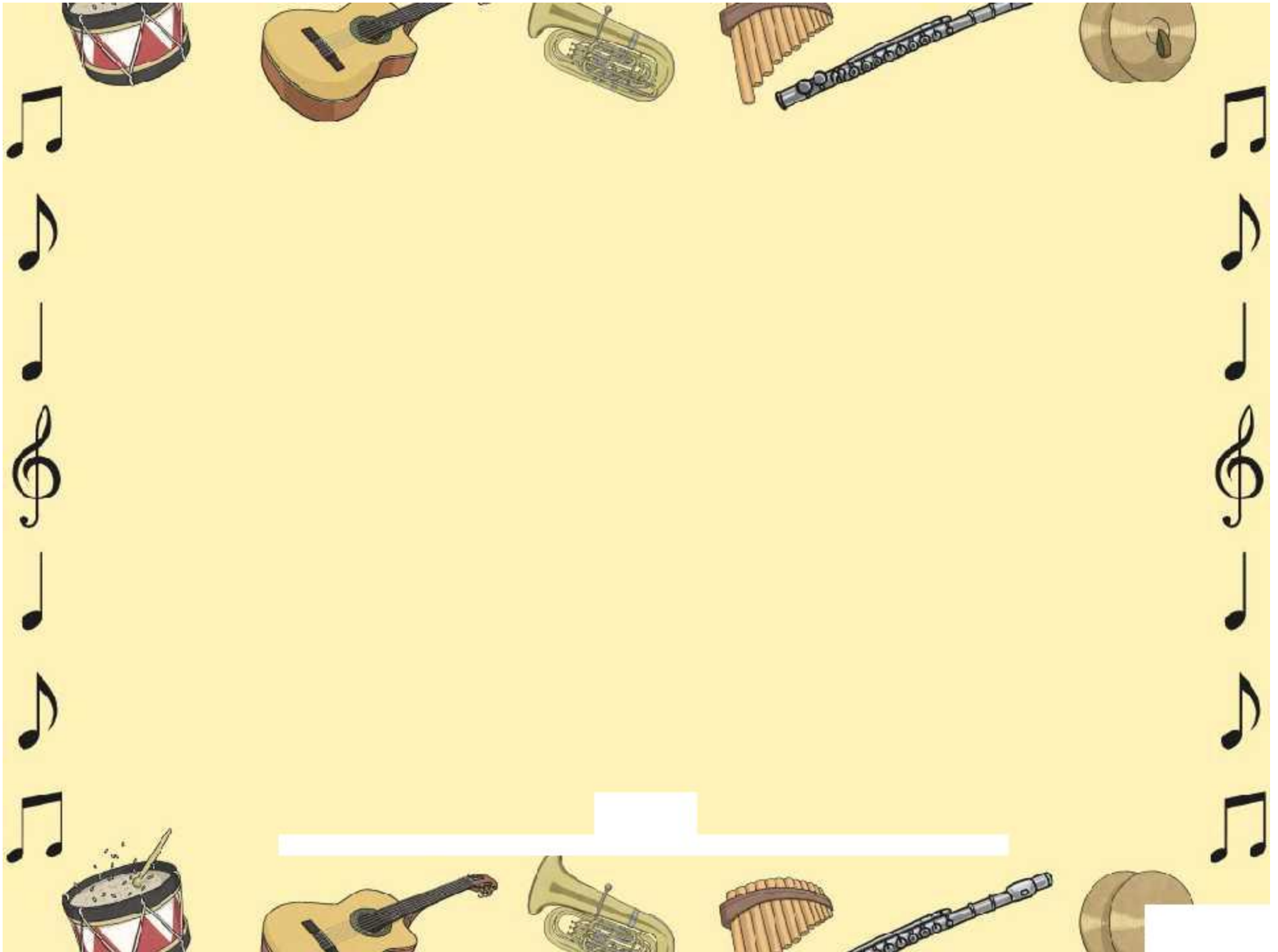
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# Success Criteria

- I can describe how vibrations make sounds.
- I can explain how vibrations change when a sound gets louder.
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# The Science of Sound



You have been asked to create an educational programme for children to explain how different sounds travel to our ears. The producers of the programme want you to explain the link between the loudness of a sound and the size of the vibrations, and explain how these sounds reach our ears.

Work with your group to plan the episode. All members of your group should take part equally. Make sure your explanations of how different sounds travel are clear and easy to understand. You may choose to use pictures or diagrams to support your explanations. Get into character and have fun!

1. Introduce yourselves and tell the audience what the programme will be about.

*Hello and welcome to The Science of Sound! In this episode we will be...*

2. Explain the link between loud and quiet sounds and the size of the vibrations.

*Sounds are made by vibrations. Loud sounds...*

3. Explain how sound travels from a sound source to our ears.

*The vibrations that make the sound travel to our ears. The vibrations...*

4. Give your audience any more information you think they need to know, then thank them for watching.

*Thank you for watching The Science of Sound! We hope...*

**You may want to use these words to help you:**

sound      small      air      particles      ear      hear  
big      source      travel      loud      quiet      vibration



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