

Topic: Science	Year group	Term
Sound	Year 4	Spring (7 weeks)

### Background knowledge

This is the first unit on sound therefore children will have a range of prior knowledge. They will have looked briefly at the sense of hearing in year 1. Data loggers are available in school to measure the volume of sound in decibels. Reach out CPD; lower primary; light and sound units provide useful background knowledge and teaching ideas. In lesson 2, you might want to make string telephones as part of the lesson to show how sound travels through different materials. Boomwhackers are available in the science cupboard and are a useful resource to explore pitch and volume of musical instruments. Pitch can be investigated by twanging rulers, plucking different thicknesses of rubber bands and blowing over glass bottles amongst others.

A sound produces vibrations which travel through a medium from the source to our ears. Different mediums such as solids, liquids and gases can carry sound, but sound cannot travel through a vacuum (an area empty of matter). The vibrations cause part of our body inside our ear to vibrate, allowing us to hear (sense) the sound.

The loudness (volume) of the sound depends on the strength (size) of vibrations which decreases as they travel through the medium. Therefore, sounds decrease in volume as you move away from the source. A sound insulator is a material which blocks sound effectively. Pitch is the highness or lowness of a sound and is affected by features of objects producing the sounds. For example, smaller objects usually produce higher pitched sounds.

#### Common misconceptions

Sound is only heard by the listener.

Sound only travels in one direction from the source.

Sound can't travel through solids and liquids.

High sounds are loud and low sounds are quiet.

### What should I already know?

Identify, name and label the basic part of the human body and say which part of the body is associated with each sense.(Y1)

Identify how sounds are made, associating some of them with something vibrating.  
Recognise that vibrations from sounds travel through a medium to the ear.

Find patterns between the pitch of a sound and features of the object that produce it.  
Find patterns between the volume of a sound and the strength of the vibrations that produced it.

Recognise that the sound gets fainter as the distance from the sound source increases.

I can describe how a sound is made.

I can explain how sound travels from a source to our ears.

I can explain the correlation between the pitch and the object producing a sound.

I can explain the correlation between the volume of a sound and the strength of vibrations that produced it.

I can explain what happens to a sound as it gets further away from its source.

Working scientifically.

asking relevant questions and using different types of scientific enquiries to answer them  
making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers

identifying differences, similarities or changes related to simple scientific ideas and processes

gathering, recording, classifying and presenting data in a variety of ways to help in answering questions

recording findings using simple scientific language, drawings, bar charts, and tables

1. Locate sources of sound around school. Pose questions to investigate about sound and determine the type of enquiry needed to answer them. Introduce related vocabulary.
2. Investigate how sound is made by vibrations and present their findings to others.
3. Investigate how sound travels looking at sound travelling through different materials.
4. Investigate and find patterns between the pitch of a sound and the features of the object that produced it.
5. Investigate and find patterns between the volume of a sound and the features of the object that produced it.
6. Investigate how a sound gets fainter as the distance increases measuring with a data logger, recording results in a table and bar chart the explaining the pattern their results show.
7. Either investigate one of the children's questions that has yet to be answered or establish that too loud a noise can damage ears and investigate which material makes the best sound insulator.

reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions

using results to draw simple conclusions.

I can set up a simple enquiry to explore a scientific question about sound.

I recognise the 5 different types of scientific enquiry which will answer questions about sound.

I can use them to answer questions about sound.

I can use equipment including data loggers to make accurate measurements of the volume of sound.

I can recognise patterns relating to the pitch and loudness of sound and write these as er...er ... statements.

I can present my findings clearly.

I can record my results clearly in tables and bar charts.

I can use my results to draw simple conclusions.

I can use and spell the scientific language of sound to explain my findings.

## Outcomes

### An overview of what children will know / can do

Working towards: I can pose questions about sound and start to identify the type of scientific enquiry needed to answer them. I can name some sound sources and know sounds are made by objects vibrating. I can investigate that vibrations from sounds travel through different materials to the ear. I can state the relationship between the pitch of a sound and the features of an object with support. I can state the relationship between volume and the strength of the vibrations producing it with support. I can record my results in tables and bar charts and use say what they show. I can observe that sound gets quieter as distance increases. I can use and spell scientific vocabulary related to sound. I can start to measure volume using a data logger.

Expected: I can pose questions about sound and identify the type of scientific enquiry needed to answer them. I can name a variety of sound sources and explain how sounds are made by objects vibrating. I can recognise that vibrations from sounds travel through different materials to the ear. I can state the relationship between the pitch of a sound and the features of an object. I can state the relationship between volume and the strength of the vibrations producing it. I can record my results clearly in tables and bar charts and use these to draw simple conclusions. I can recognise that sound gets quieter as distance increases. I can use and spell scientific vocabulary related to sound in my explanations. I can measure volume using a data logger.

Exceeding: I can pose questions about sound and identify the type of scientific enquiry needed to answer them confidently. I can name a variety of sound sources and can clearly explain how sounds are made by objects vibrating. I can recognise that vibrations from sounds travel through different materials to the ear and identify the materials sounds travel through more easily. I can confidently state the relationship between the pitch of a sound and the features of an object. I can state the relationship between volume and the strength of the vibrations producing it explaining why I think this may be the case. I can record my results accurately in tables and bar charts and use these to draw simple conclusions. I can recognise that sound gets quieter as distance increases explaining why. I can use and spell scientific vocabulary related to sound accurately in my explanations. I can measure volume accurately using a data logger.

Key Vocabulary	Timeline / Diagrams
<p>Data logger- can be used to measure the volume of sound.</p> <p>Decibel- the unit the volume of sound is measured in.</p> <p>High pitched sound- a squeaky sound.</p> <p>Low pitched sound- a deep sound.</p> <p>Pitch- how low or high a sound is.</p> <p>Sound- a form of energy that can be heard.</p> <p>Sounds are made by vibrations.</p> <p>Vibration- a regular and repeated movement backwards and forwards.</p> <p>Volume- the loudness of a sound.</p> <p>Bar chart- presenting your result in a way that can be seen visually.</p> <p>Comparative statement- Comparing one thing with another.</p> <p>Conclusion; To look at our results and explain what we have found out.</p> <p>Investigation - to find something out</p> <p>Measure- to find out the quantity of something.</p> <p>Observe - to look at something closely</p> <p>Pattern seeking- To look for a pattern in your results.</p> <p>Record- to write down what we found out.</p> <p>Table- a way of organising your findings.</p>	<div data-bbox="826 398 1385 801"> <h3 style="text-align: center;">SOURCES OF SOUND</h3> <p>The drum skin vibrates and makes the air around the drum vibrate.</p> <p>The vibrating air spreads away from the source - this is a sound wave.</p> <p>Finally, your ear picks up the sound wave and your brain translates the sound.</p> </div> <div data-bbox="890 900 1465 1438"> <p><b>LOW</b> Frequency <b>HIGH</b> Frequency</p> <p><b>LOW</b> Pitch <b>HIGH</b> Pitch</p> <p><b>LARGER LONGER THICKER</b></p> <p><b>SMALLER SHORTER THINNER STRETCHED OUT</b></p> <p>Woof!</p> <p>Yip</p> </div>

Key people / places
<p>STEM jobs; Music producer, sound engineer.</p> <p>Alexander Grahame Bell- inventor of the telephone</p>

Assessment questions / outcomes
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1. Name different sound sources.
2. Explain how a musical instrument makes a sound.
3. Which materials can sound travel through?
4. Finish the comparative statements; The higher the pitch, .....  
The lower the pitch.....
5. How can we make the noise of the drum louder?
6. What happens when you move away from a sound source?
7. Which question did we investigate? What type of enquiry did we use? What did we find out?