

National Curriculum Science - Knowledge

Key Learning

Vocabulary

Pupils should be taught to:

- 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 produced it
- find patterns between the volume of a sound and the strength of the vibrations that produced it
- recognise that sounds get fainter as the distance from the sound source increases

**What I should already know:** Hearing is one of my 5 senses. Sounds can be created using musical instruments.

How do we hear sounds?

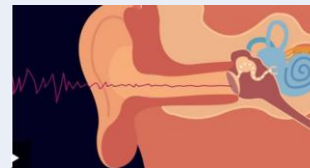


Sound waves can travel through solids (such as metal, stone and wood), liquids (such as water) and gases (such as air).

Sounds are made when objects vibrate. When an object vibrates, the air particles around it vibrates too. This vibrating air can also be known as sound waves.

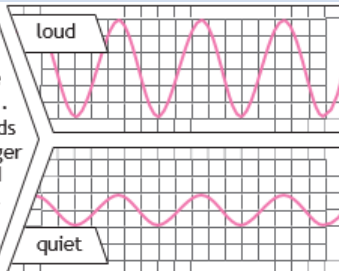
The sound waves travel to the ear and make the eardrums vibrate.

Messages are sent to the brain which recognises the vibrations as sounds



How do sounds change?

The size of the **vibration** is called the **amplitude**. Louder sounds have a larger **amplitude**, and quieter sounds have a smaller **amplitude**.



**Pitch** is a measure of how high or low a sound is. A whistle being blown creates a high-**pitched** sound. A rumble of thunder is an example of a low-**pitched** sound.

The closer you are to the source of the sound, the louder the sound will be. The further away you are from the source of the sound, the quieter the sound will be.

- Vibration**- A movement backwards and forwards
- Sound wave** - Vibrations travelling from a sound source
- Source** - The beginning; where something comes from
- Volume** - The loudness of a sound
- Amplitude** -The size of a vibration. A larger amplitude = a louder sound
- Pitch**- How high or low a sound is
- Soundproof** - To prevent sound from passing
- Absorb sound**- To take in sound energy. Absorbent materials have the effect of muffling sound
- Eardrum**- A part of the ear which is a thick, tough layer of tissue that is stretched out like a drum skin. Sound waves make the eardrum vibrate
- Vacuum** - A space where there is nothing (no particles) so sound cannot travel.

## National Curriculum Science – working scientifically

- Asking relevant questions and using different types of scientific enquiries to answer them
- Setting up simple practical enquiries, comparative and fair tests
- Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- Identifying differences, similarities or changes related to simple scientific ideas and processes
- using straightforward scientific evidence to answer questions or to support their findings.

## Key Learning continued...

### How do sounds travel?

Sound waves travel through a medium (such as air, water, glass, stone, and brick). For example, if somebody is playing music in the room next door, the sound can travel through the bricks in the wall.



Some materials are good at preventing vibrations from sound sources reaching the ear. These can be used to soundproof (absorb the sound) effectively.

## Scientific investigations

To plan and carry out a fair test – Does the distance from the sound source affect the volume?

- Fair testing
- Collecting data
- Presenting data – line graph
- Draw conclusions

To carry out comparative test – Which material is best for sound proofing?

- fair testing
- Collecting data
- Presenting data - tables
- Draw conclusions

## Sequence of learning – Sound

1. **How are sounds made?** – sounds are made from objects vibrating, creating sound waves and these travel from the source to our ears and how we hear these as sounds. Observe how different instruments make sounds.
2. **How are sounds heard in different Mediums?** – Explore how sound travels in waves through different mediums and research how dolphins and whales communicate.
3. **How does the vibration strength affect the volume?** – explore how the stronger the vibration the greater the volume. Explore how to change the volume of the different instruments from lesson 2. Create a bar chart for the volume of everyday materials.
4. **How does distance affect the volume of a sound?** – investigate how the further you are from the sound the quieter it gets. Use a recorded sound and a sound meter to measure the decibels. Children plan and carry out investigation making it a fair test.
5. **What is pitch and how can you change it?** – Explore vocal range and how this is an example of pitch (how low and high sounds are) Pitch is determined by how fast the sound waves are – the closer together the higher the pitch. Use bottles with differing amounts of water to explore how pitch changes. Can you change the pitch of the instruments from lesson 2?
6. **What is the best material for sound proofing?** Plan experiment for how to protect children’s ears at a music concert. Use different materials to soundproof a studio (sound from an ipad in a tray covered with each material). Record results in a table and draw conclusions about which material blocked the sound the best.