



Sound (Physics)

Year 4

End Points:

- Sound is caused by a back and forth movement called vibration
- Sound waves move out from a vibrating object
- Sound can travel through different types of matter (solid, liquid, gas)
- Sound is fainter the further from the source it is
- Pitch is how high or low a sound is and relates to the speed of vibrations
- Volume is how loud or quite a sound is and relates to the strength of the vibrations
- Louder sounds are made by bigger vibrations
- Quieter sounds are made by smaller vibrations
- Faster vibrations make higher-pitched sounds
- Slower vibrations make lower-pitched sounds
- We hear through soundwaves entering the ear, travelling through it and the messages sent to the brain

This unit builds on knowledge from Year 3 Light, particularly around how the eye sees as they focus on how the ear hears in this unit. In this unit pupils will learn that sound is caused by a back-and-forth movement: a vibration. A vibrating object will make the particles of air around it vibrate too. The air particles, which are pushed one way, push neighbouring particles in the same way, and then bounce back, so the vibration spreads outwards. This vibration spreading outwards is what we call sound. How far away you can hear a sound depends on its volume. This is to do with the amplitude (size) of the vibration. A quiet sound, like a whisper, doesn't travel very far. But a really loud sound can travel for hundreds of miles. Pupils will learn that more than a hundred years ago when a volcano exploded on the island of Krakatoa, the sound could be heard in Australia, almost three thousand miles away. This will link to their knowledge of world geography.

Pupils will learn that when you sing a high note, your vocal cords vibrate very fast, hundreds of times a second. We call this a high frequency sound and we hear it as high pitch. When you sing a low note, your vocal cords vibrate more slowly. Lower frequency vibrations make a sound with a lower pitch. This will link to their learning in Music.

Pupils will work scientifically by investigating the different sounds made by vibrations using a range of objects including musical instruments. They will ask and answer questions and explain what they find out using scientific writing and diagrams.

Lesson Sequencing:

In lesson one, children will learn how sound is produced and how it travels, looking at air particles and vibrations. This knowledge will be further developed in lesson two when children look how at sound travels through the air. In lesson three, children will explore the difference between pitch and volume, and how we can affect them both. Lesson four will further understanding on pitch and volume by looking at the human voice and the different sounds it can make. In lesson five, children will learn how the ear enables us to hear sounds. In the assessment lesson, children will apply the knowledge learnt to explain what sound is, how it is made and how it travels.

Misconceptions:

- Sound travels only to the listener
- For a sound to be heard fully, the listener has to concentrate on it
- Sound only travels in one direction from the source
- Sound can't travel through obstacles (solids) and liquids
- High sounds are loud and low sounds are quiet

Working Scientifically criteria met in this unit:

- 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.