

Key Knowledge

Learn these key facts – **key points in red**

Key Vocabulary

Understand these key words

Sound—what do we need to know?

What is sound?

- **Sound** is a thing that can be heard.
- The object that makes the **sound** is called a **source**.

How is a sound made?

- When objects **vibrate**, a **sound** is made.
- The **vibration** makes the air around the object vibrate and the air vibrations enter your **ear**. These are called **sound waves**.
- If an object is making a **sound**, a part of it is **vibrating**, even if you cannot see the vibrations.

How do we hear sounds?

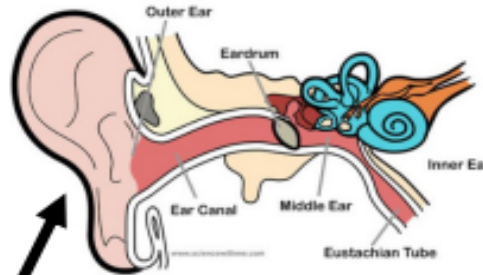
- **Sound waves** travel to the **ear** and make the ear drum **vibrate**.
- Messages are sent to the brain which recognises the **vibrations** as **sound**.

How do sounds travel?

- **Sound waves** travel through a **medium** (such as air, water, glass, stone, and brick).

How do we measure sound?

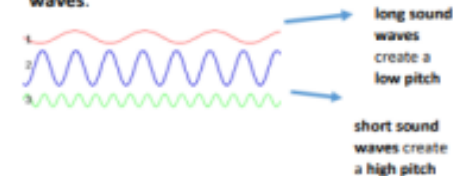
- **Amplitude** measures how strong a sound wave is.
- **Decibels** measure how loud a sound is.
- **Frequency** measures the number of times per second that the sound wave cycles.



How do sounds change?

Pitch:

- **High pitch** sounds are created by **short sound waves**.
- **Low pitched** sounds are created by **long sound waves**.



Volume:

- 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.



VIBRATIONS

Sound is made when an object vibrates and therefore causes the air around it to vibrate too. These vibrations are carried to your ear for you to hear them.



Sound vibrations can travel through different materials:

SOLIDS: metals, stone, wood
LIQUIDS: water
GASES: air

Sound travels better through some materials than others. It travels very well through metal pipes for example.

The louder the volume, the bigger the vibrations. The size of the vibration is called the **amplitude**. Quieter volumes have smaller amplitudes and louder sounds have larger amplitudes.



Sounds travel in a **wave**. The vibrations make **air particles** closest to the object vibrate, which then passes the vibrations to the particle next to it and so on - like dominoes falling!



Focus Scientist — Alexander Graham Bell



Alexander Graham Bell was a Scottish scientist who invented the telephone in 1876.

Word	Definition
amplitude	a measure of strength of a sound wave .
decibel	a measure of how loud a sound is.
ear	the organ of hearing and balance. It has an outer part, a middle part and an inner part.
frequency	a measure of how many times per second a sound wave cycles.
insulation	material that stops the travel of energy (including sound).
medium	something that makes it possible to transfer energy from one location to another.
pitch	how high or low a sound is.
sound	a type of energy made by vibrations .
sound waves	invisible waves that travel through the air, water and solid objects as vibrations .
source	where something comes from.
transmit	to pass from one place or person to another.
vibration	invisible waves that move quickly.
volume	how loud or quiet a sound is.

Focus Scientist — Beth O'Leary

Beth O'Leary is a live sound technician and engineer who talks about sound engineering as a career and some of the issues that come from working in a male-dominated profession (see <https://soundgirls.org/contributors/beth-oleary/>).