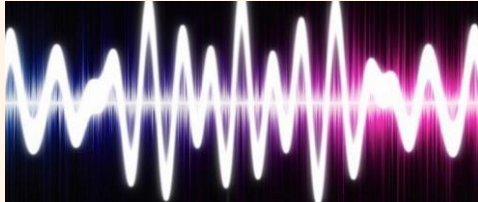


What should I already know?

- Hearing is one of my 5 senses
- Sounds can be combined using musical instruments

How do we hear sounds?

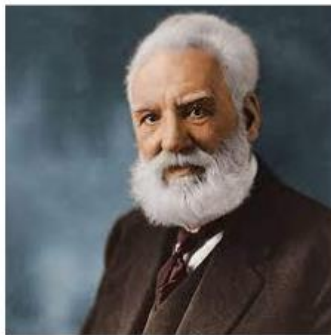
Sound waves can travel through solids (such as metal, stone and wood), liquids (such as water) and gases (such as air).



Sounds are made when objects **vibrate**. When an object vibrates, the air 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

Focus scientists

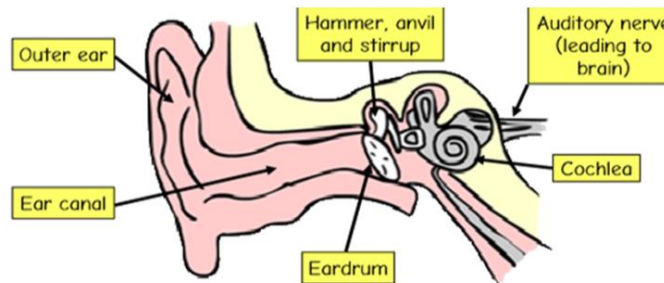
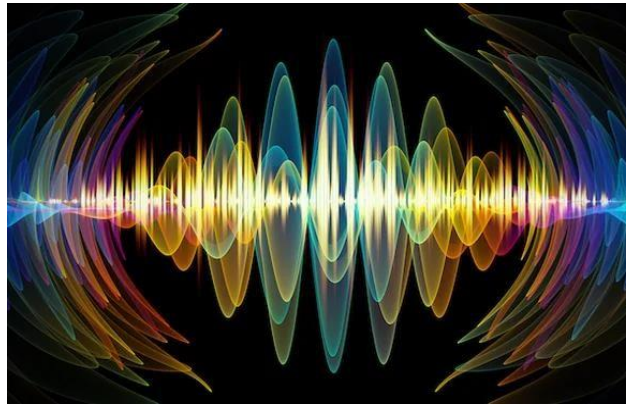
Alexander Graham Bell (1847-1922) was a Scottish scientist. His research on hearing and speech led him to experiment with hearing devices and ultimately inventing the telephone in 1876.



Key Knowledge

Sound is a type of energy. Sounds are made when objects **vibrate**. The vibration makes the air around the object vibrate and the air vibrations enter your ear. You hear them as sounds.

You cannot always see the vibrations, but if something is making a sound, some part of it is always vibrating.



Key Vocab

Vibration	A movement backwards and forwards
Sound wave	Vibrations travelling from a sound source
Volume	The loudness of a sound
Pitch	How high or low a sound is
Ear	An organ used for hearing
Hammer Anvil Stirrup	Moves when the ear drum vibrates Moved by the hammer Moved by the anvil
Ear canal	Tube that runs from the outer ear to the inner ear.
Auditory nerve	Carries messages from the cochlea to the brain
Cochlea	When the stirrup moves, fluid inside the cochlea moves. Hearing receptors turn the movement into signals
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

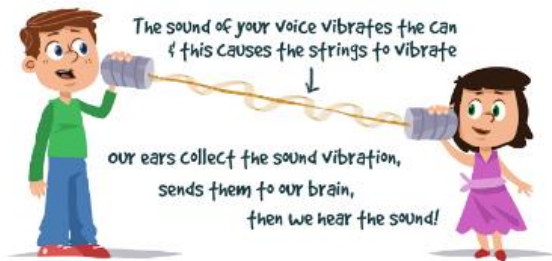
Pitch is a measure of how high or low a sound is. A whistle being blown creates a high-pitched sound. A rumble of thunder is an example of a low-pitched sound.



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.



How do sounds change?

Pitch:

The **pitch** of a sound is how high or low it is.

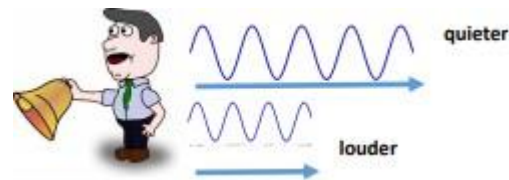
A squeak of mouse has a **high pitch**.
A roar of a lion has a **low pitch**.

Volume:

The **volume** of a sound is how loud or quiet it is. When a sound is created by a little amount of energy, a weak **sound wave** is created which doesn't travel far. This makes a quiet sound.

A small tap of a hammer is used with small amounts of energy and so creates a quiet noise.

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.



A **vibration** with lots of energy makes a powerful sound wave and therefore a loud sound. A powerful, smashing tap of a hammer is used with lots of energy and so creates a loud noise.

How musical instruments make different sound

Instruments with strings

A cello has different thicknesses of strings. When the strings vibrate the thick strings vibrate more slowly than thin ones. Thick strings give a low pitch, thin strings give a high pitch. The tightness or tension of a string is also important. The tighter the string, the higher the pitch. The less tight a string, the lower the pitch.

Volume

The **volume** of a sound is how loud or quiet it is.

Quieter sounds have a smaller amplitude and less energy (smaller vibrations) and louder sounds have a bigger amplitude and more energy.

The closer we are to a sound source the louder it will be.



A train arriving at a station sounds loud

The further away from a sound the fainter it will be.



A train in the distance sounds quieter