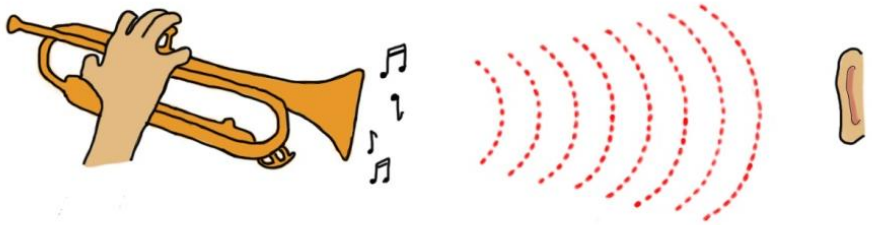
Sound and Hearing

What is Sound?

Sound is a form of energy. A sound is made when something vibrates, making the air around vibrate. These air vibrations (sound waves) then enter our ears and so we are able to hear sounds. This is why sound cannot be heard in a vacuum because there is no air to vibrate. Sound waves radiate from the source of the sound in all directions and can bend round corners and obstacles.

FUN FACT!
There is no sound in space because there is no air!

Sound waves travelling from a trumpet to the ear.



Sound can travel through solids, liquids and gases, although it travels through some materials better than others. For example, in air sound travels at 340 metres per second but in water it travels at 1500 metres per second. This is why divers can hear better under water! Sound travels even more quickly through metal, for instance, through a metal pipe.

FUN FACT!
A whisper would measure about 20 dB, whereas a jet plane would be about 135 dB.

How can Sounds be Different?

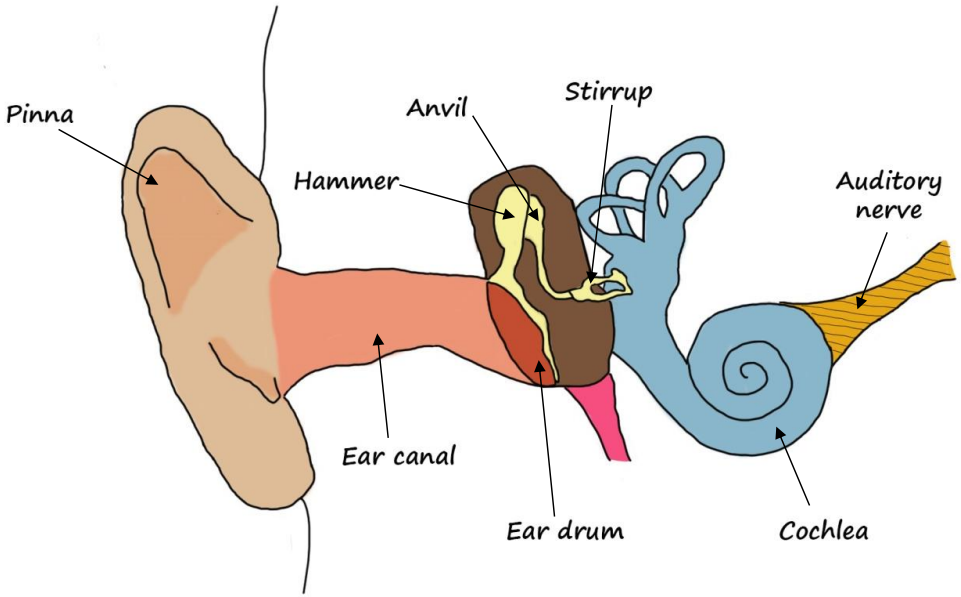
Sounds can be different as different sounds have different frequencies. The frequency is the number of vibrations produced in a second. This is more commonly known as pitch. The pitch of sounds can vary, for example, musical instruments can play high and low sounds. The faster the vibrations, the higher the sound. Sound can also be different volumes and this can be measured in decibels (dB).

How Do We Hear Sound?

Firstly, sound waves are gathered by the outer ear called the pinna. Then the vibrations travel along the ear canal which connects the outer ear to the middle ear. This makes the ear drum (a thin layer of skin) vibrate. There are three tiny bones located next to the ear drum called the hammer, anvil and stirrup. These bones then amplify the vibrations causing ripples through the fluid in the cochlea. The cochlea is a snail shaped chamber filled with liquid and is lined with tiny hairs and nerve endings. Next, the nerve endings turn these vibrations into electrical signals and send them to the brain via the auditory nerve. Finally, the brain interprets these signals as sound.

FUN FACT!
The stirrup is the smallest bone in the human body.

Anatomy of the human ear



Why is Sound Important?

Sound is one of the five senses and is important to humans and animals as a way of communication, for example, humans speaking to each other or dogs barking. It is also very helpful in alerting us to potential dangers, such as, oncoming vehicles when crossing the road.

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Sound and Hearing – Follow-Up Work 1

Which phrase used in the text means the same as 'air vibrations'? (AF2)

_____

When is sound made? (AF2)

_____

Which material does sound travel fastest through? (AF2/AF3)

_____

Can you estimate how many decibels a dog's bark would be? (AF3)

_____

How many subheadings are there? (AF4)

_____

Why can you not hear in space? (AF2)

_____

Why do you think the writer has put some facts in blue boxes? (AF6)

_____

How many captions are there? (AF4)

_____

What are the names of the three bones in the middle ear? (AF2)

_____

How many captions are there? (AF4)

_____

What are the names of the three bones in the middle ear? (AF2)

_____

Why do you think the writer described the cochlea as 'snail like'? (AF5)

_____

Find three time openers/connectives that the writer used to explain how we hear. (AF2/AF5)

_____

The writer gives some examples of communication. Can you think of some other ways of communicating? (AF7)

_____

What is the purpose of this text? (AF6)

_____

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