

Sound

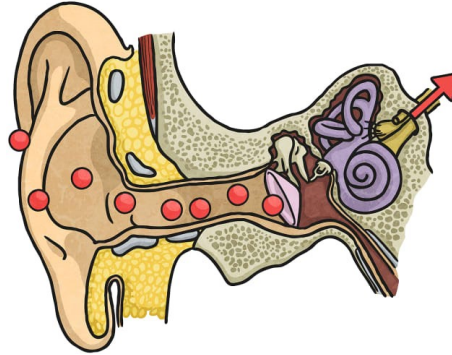
Knowledge Organiser



Vocabulary

Word	Meaning
absorb sound	To take in sound energy. Absorbent materials have the effect of muffling sound.
amplitude	The size of a vibration. A larger amplitude=a louder sound.
distance	A measurement of length between two points.
eardrum	A part of the ear which is a thin, tough layer of tissue that is stretched out like a drum skin. It separates the outer ear from the middle and inner ear. Sound waves make the eardrum vibrate.
particles	Solids, liquids and gases are made of particles. They are so small we are unable to see them.
pitch	How low or high a sound is.
sound wave	Invisible waves that travel through air, water and solid objects as vibrations.
soundproof	To prevent sound from passing through.
vacuum	A space where there is nothing. There are no particles in a vacuum.
vibration	A rapid movement backwards and forwards.
volume	The loudness of a sound.

How sounds are made



Like light, sound travels through the air in waves. Sound is made by air molecules vibrating. When you clap your hands, the air around your hands shakes. This is the air molecules vibrating. When air molecules inside the ear vibrate, they shake tiny hairs on the insides of the ears. The hairs are connected to nerves under the skin. These nerves send messages to your brain to tell you that you heard a noise. Sound travels much slower than light, whether in air or in water. You often hear things after you see them, for example you see the lightning before you hear the thunder.

Vibrations

Sounds are made when something vibrates. By placing rice on a drum, you can see the vibrations when you hit the drum, as well as hearing the sound. The louder the sound, the bigger the vibration. The size of the vibration is called the amplitude.



Louder sounds have a larger amplitude, and quieter sounds have a smaller amplitude.

Measuring Sound

The loudness of a sound is measured in decibels (dB). Something that is very loud has a high number of decibels.

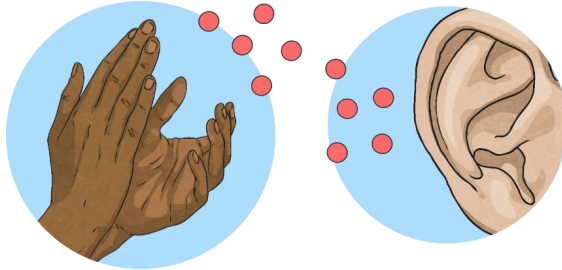
- Police siren—120dB
- Hairdryer—90dB
- Conversation—60 dB
- Whisper—30dB

Special devices can be used to measure how loud something is.



How does sound travel?

Sound can travel through solids, liquids and gases. Sound travels as a wave, vibrating the particles in the medium it is travelling in. For example, when you hit the drum, the drum skin vibrates. This made the air particles closest to the drum start to vibrate as well. The vibrations then passed to the next air particle, then the next, then the next. This carried on until the air particles closest to your ear vibrated, passing the vibrations into your ear. Sound cannot travel through a vacuum.



Sound

Stopping Sound

Just like with heat or electricity we can use an insulator to stop sounds travelling. A material which stops or reduces sound is described as being soundproof. A soundproof material absorbs the sound and stops the sound waves passing through the air and into the ear. An example of this is when a house has soundproof materials to stop noise travelling from one room to another.



Sounds and the Ear



Communicating with the brain

Sounds are made when objects vibrate. The vibration makes the air around vibrate, and the air vibrations enter your ear. Inside your ear, the vibration hits the ear drum and then passes to the middle and then the inner ear. They are then changed to electrical signals and sent to your brain. Your brain tells you that you are hearing a sound.

Extending your learning

Things you could do at home to extend your learning:

1. Carry out a "sound survey" of the different sounds you can hear around your home. Can you put them in order from loudest to quietest?
2. Investigate different materials you can find around your home to see how good they are as a soundproofing material.
3. Draw sounds. Use your imagination to create a visual representation of you think different sounds look like.
4. Make a set of tin can telephones to investigate how sound vibrations travel along string.