

Knowledge organiser



Y8 topic: SOUND

I have already learned:

In KS2: Sounds are produced by vibrations that travel through a medium. The volume and pitch of a sound are related to how the sound was made and sounds get fainter with distance from the source.

Y7: The difference between transverse and longitudinal waves; that waves have a frequency; that waves can be reflected and they transfer energy.

This topic links to:

KS4: Unit P6 Waves

It is important to study about sound because...

Most of us communicate using sound all the time and we enjoy using technologies that produce sounds, like our phones and TVs. Understanding how we hear helps us to protect our ears from damage.

Possible careers involving ideas about sound are...

- Audio technician
- Audiologist
- Engineer
- Physiotherapist
- Recording technician
- Zoologist

KNOWLEDGE ORGANISER

BIG IDEA: WAVES

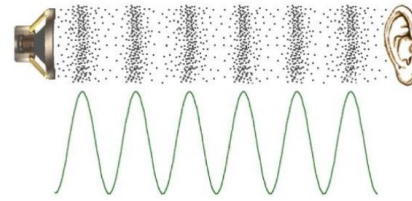
TOPIC: SOUND

Key Word	Definition
vibration	A back and forth motion that repeats
longitudinal wave	Where the vibration of the wave particles is parallel to the direction of energy transfer
volume	How loud or quiet a sound is, measured in decibels (dB)
pitch	How low or high a sound is
absorb	Take in energy
medium	A substance that energy can be carried by
frequency	The number of waves produced in one second, in hertz (Hz)
vacuum	A space with no particles of matter in it
oscilloscope	Device for viewing patterns of sound waves that have been turned into electrical current
auditory range	The lowest and highest frequencies that a type of animal can hear
echo	Reflection of sound waves from a surface back to the listener
ultrasound	Sound waves with a frequency above the auditory range for humans (> 20,000 Hz)
wavelength	The distance from a point on one wave to the identical point on the next wave

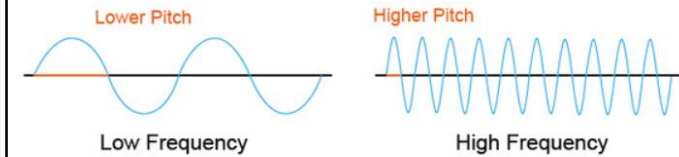
Sound is a wave that transfers energy from one place to another. A sound is caused by a source **vibrating**. The energy is transferred by the vibrations being passed on. The vibrations are detected by our ears and our brain processes this information as sound.

Sound can travel through any substance that is made up of matter. However, the **denser** the medium, the faster the vibrations can be transferred. This means denser materials have a higher speed of sound.

Sound cannot travel through a **vacuum** because there are no particles to pass on the vibration.



Sound has two basic properties: **volume** and **pitch**. A high volume (loud) sound is caused by a sound wave with a high amplitude. A high pitched sound is caused by a sound wave with a high frequency.



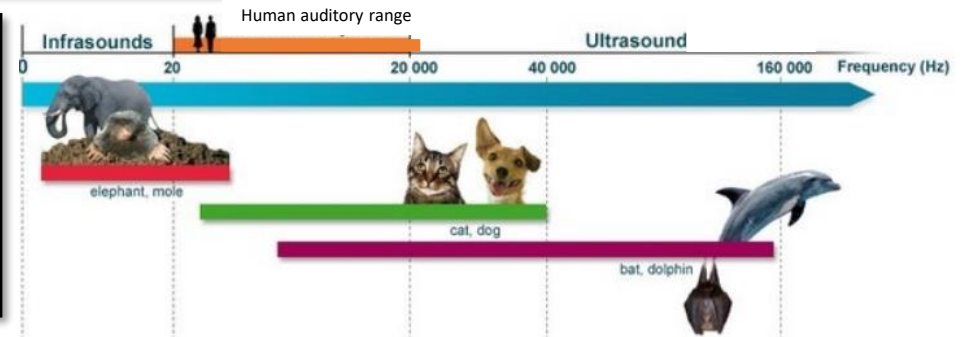
Sound waves can reflect off flat surfaces to make echoes.

Sound waves with very high frequencies can be used to clean things by making them vibrate so that the dirt falls off.

These waves are called ultrasound and they can also be used in physiotherapy to treat injuries.

Sound is a pressure wave. Some pressure waves can transfer so much energy that they are dangerous.

Humans cannot detect all sound waves. The range of frequencies of waves that we can detect is called the auditory range. Humans can hear frequencies of about 20 – 20,000 Hz. This auditory range narrows with age.



An oscilloscope is a piece of equipment which can help us visualise sound waves.

Using a microphone and an oscilloscope, we can transform the longitudinal sound wave into a transverse wave that can be seen on the oscilloscope screen.