

# Knowledge Organiser - Year 4 - Science: Sound



**Sound** - Sound is a type of energy made by vibrations. This movement causes sound waves which reaches our ears through the air.

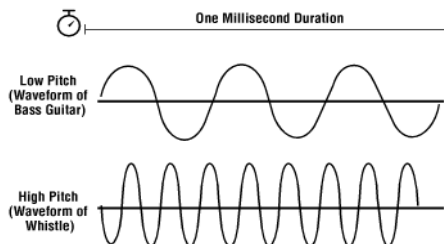
## Key Vocabulary

<b>Amplitude</b>	How loud a sound is.
<b>Auditory</b>	Relating to the sense of hearing.
<b>Cochlea</b>	A hollow, coiled tube inside the inner ear that contains nerves to help carry information about sound to the brain.
<b>Decibel</b>	(Db) A unit for measuring the loudness of a sound.
<b>Ear canal</b>	The tube that connects the outer and middle ear.
<b>Ear drum</b>	A piece of tightly stretched skin inside the ear that vibrates in response to sound waves.
<b>Frequency</b>	Amount of vibrations per second.
<b>Insulation</b>	A material used to stop sound, heat or electricity from passing through it.
<b>Ossicles</b>	Three small bones in the middle ear; the hammer, the anvil and the stirrup.
<b>Outer Ear</b>	The part of the ear, which includes the pinna and ear canal, that collects sound waves and directs them towards the ear drum.
<b>Pinna</b>	The visible part of the outer ear that is outside the head and acts as a funnel, directing sounds down the ear canal.
<b>Pitch</b>	The measure of how high or low a sound is.
<b>Semi circular canals</b>	These are three tiny, fluid-filled tubes in your inner ear that help you keep your balance. When your head moves around, the liquid inside the semicircular canals sloshes around and moves the tiny hairs that line each canal.
<b>Vibration</b>	A quick, back and forth movement.
<b>Volume</b>	How loud or quiet a sound is.

## Working Scientifically

Pupils should be given a range of scientific experiences to enable them to raise their own questions about the world around them. They should think about the most appropriate type of scientific enquiry they might use to answer questions; recognise when a simple fair test is necessary and help to decide how to set it up. They should begin to look for naturally occurring patterns and relationships and decide what data to collect. They should collect data from their own observations and measurements, using simple tables and standard units, and help to make decisions about how to record and analyse this data. Pupils should use relevant scientific language to discuss their ideas and communicate their findings.

## Key Question: How do we hear sounds?

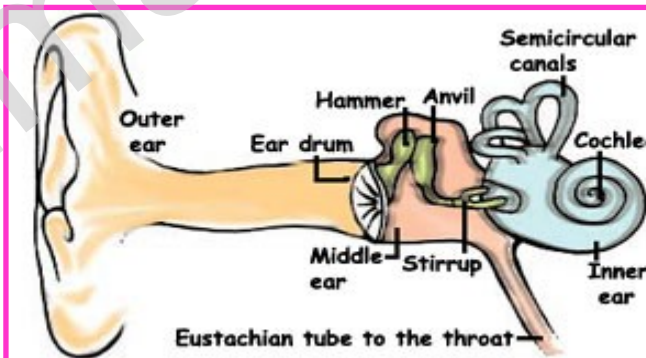
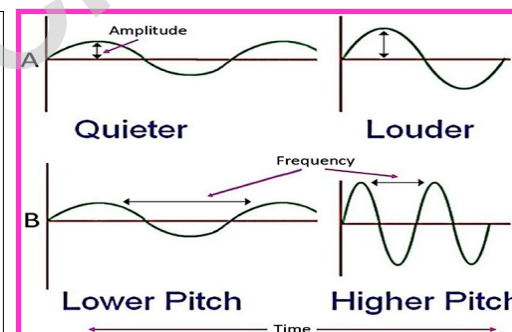


### Sound Waves

The pitch of a sound is how high or low it is. An example of a high-pitched sound is a whistle, and a low pitched sound is the rumble of a heavy lorry. Pitch depends on how quickly or slowly the object vibrates. When an object vibrates quickly, high-pitched sounds are created, and when an object vibrates slowly, a low pitched sound is created.

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.

The volume of a sound is how loud or quiet it is. Volume depends on the strength of the vibration. Stronger vibrations produce louder sounds and weaker vibrations produce quieter sounds.



The ear is an organ that allows us to hear. The Pinna (or outer ear) is the only part of the ear that is outside the head and it has a special shape to funnel sound into the ear canal.

When an object vibrates, it causes sound waves, which travel through the air to the ear. The sound waves then travel through the ear canal to the eardrum. The eardrum vibrates, sending vibrations to 3 tiny bones inside the ear. These bones are the hammer, anvil and stirrup, together they are called the ossicles. The ossicles are joined and allow vibrations to travel to the cochlea. The cochlea is a spiral shaped tube which then turns vibrations from the ossicles into electrical signals that the brain can understand.

Sound waves can also travel to the ear through liquids such as water, and solids, such as glass.

### Decibels

The volume of a sound is measured in decibels (dB). If humans listen to a sound that is over 85dB for a long period of time, it can damage their hearing.

Sound level (db)	Example
10	Pin dropping
15	Whispering
60	Speaking
75	Toilet flushing
90	Lawn mowing
110	Rock band playing
120	Thunder rumbling
180	Rocket launching

Sound level (db)  
10  
30  
60  
75  
90  
110  
120  
180