

Manor Primary School Knowledge Organiser – KS2 Owls Science



Topic: Sound

Phase: KS2

Strand: Physics

What should I already know?

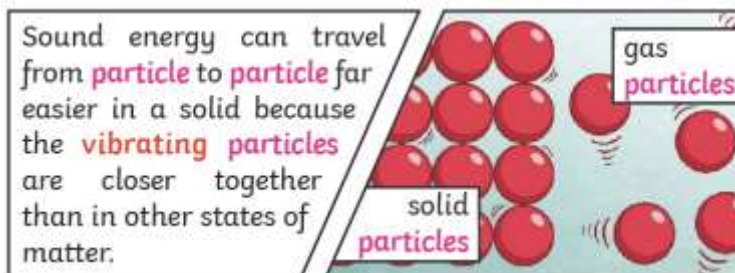
- How sounds can be changed.
- Hearing is one of my five senses.
- Sounds can be combined using musical instruments.
- Animals including humans use their ears to hear.
- I can make a range of different sounds with my voice.
- What the word vibration means.

At the end of the unit, I will be able to:

- Identify how sounds are made, associating some of them with something vibrating.
- Recognise that vibrations from sounds travel through a medium to the ear.
- Find patterns between the pitch of a sound and features of the object that produced it.
- Find patterns between the volume of a sound and the strength of the vibrations that produced it.
- Recognise that sounds get fainter as the distance from the sound source increases.
- Understand that Amplitude measures how strong a sound wave is.
- Decibels measure how loud a sound is.
- Frequency measures the number of times per second that the sound wave cycles.

Key Knowledge

- Sound is a type of energy. Sounds are created by vibrations. The louder the sound the bigger the vibration.
- 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.
- Amplitude measures how strong a sound wave is.
- Decibels measure how loud a sound is.
- Frequency measures the number of times per second that the sound wave cycles.
- Inside your ear, the vibrations hit the eardrum and are then passed to the middle and then the inner ear. They are then changed into electrical signals and sent to your brain. Your brain tells you that you are hearing a sound.



We are MANOR! As Scientists we will ...

Manners

Develop a respect and understanding for the natural world, its people, animals and plants. Share ideas, celebrate good work, value others' contributions, or discussions and debates.

Aspiration

Learn by being challenged in a series of well-designed scientific enquiry and investigation tasks linked to meaningful contexts and develop a knowledge of scientists and careers to broaden our horizons. Be aspirational in developing scientific knowledge and conceptual understanding through biology, chemistry and physics.

Nurture

To recognise that we live in a wonderful world made up of many different people and living things. We will develop an appreciation and respect for the diverse world and environment in which we live, showing care and compassion for the environment around us.

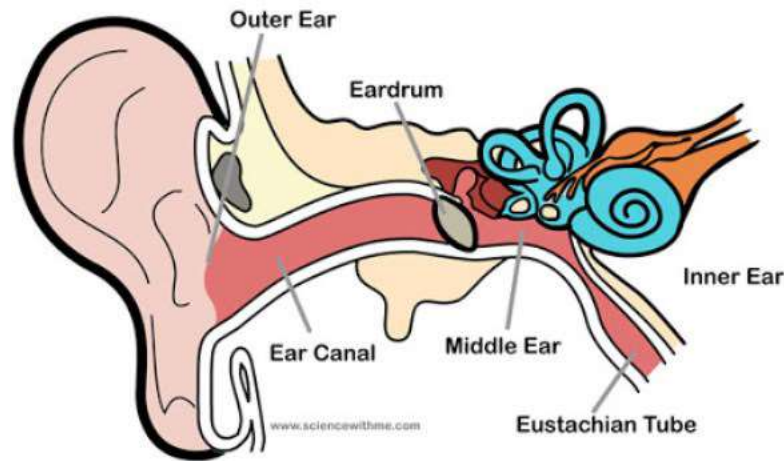
Open-Mindedness

We will be open-minded so that we can conduct experiments or observe what is happening in order to see patterns that might emerge or to gain new knowledge. We will use our curiosity and learn to wonder why something behaves a certain way.

Resilience

Engage confidently with the science curriculum and learn that anything is possible and failure is not something to fear but to learn from. We will develop our scientific enquiry and investigation skills with patience and care, repeating investigations to check the accuracy of results.

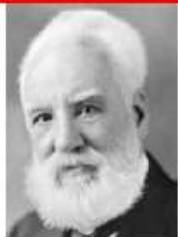
Diagrams and information



How do we hear sounds?

- Sound waves travel to the ear and make the ear drum vibrate.
- Messages are sent to the brain which recognises the vibrations as sound.

Focus Scientist — Alexander Graham Bell



Alexander Graham Bell was a Scottish scientist who invented the telephone in 1876.

PITCH

The pitch of a sound is how high or how low it sounds. A high pitch has a high sound and a low pitch has a low sound.

Stringed Instruments

Tighter, thinner or shorter strings make higher pitches. Faster vibrations make pitches high and slower vibrations make pitches low.



Wind Instruments

The column of air inside the instrument causes it to vibrate. Shortening this makes a higher sound, lengthening it makes a lower sound.

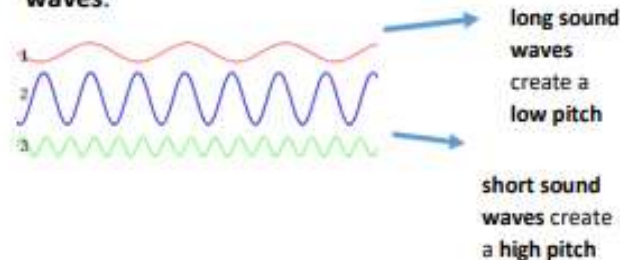


Percussion Instruments

The surface is struck and it therefore vibrates. Smaller instruments have higher sounds (smaller keys of a xylophone, hand bells etc.). The tighter or thinner the skin on a drum, the higher the pitch.

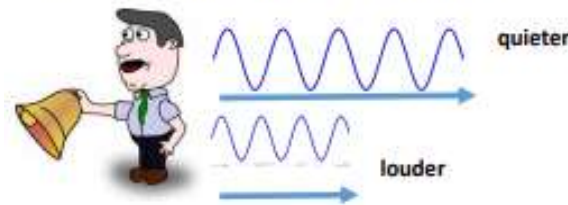


- High pitch sounds are created by short sound waves.
- Low pitched sounds are created by long sound waves.



Volume:

- 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.



Focus Scientist — Beth O'Leary

Beth O'Leary is a live sound technician and engineer who talks about sound engineering as a career and some of the issues that come from working in a male-dominated profession (see <https://soundgirls.org/contributors/beth-oleary/>).

VIBRATIONS

Sound is made when an object vibrates and therefore causes the air around it to vibrate too. These vibrations are carried to your ear for you to hear them.

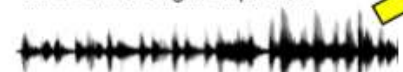


Sound vibrations can travel through different materials:

SOLIDS: metals, stone, wood
LIQUIDS: water
GASES: air

Sound travels better through some materials than others. It travels very well through metal pipes for example.

The louder the volume, the bigger the vibrations. The size of the vibration is called the amplitude. Quieter volumes have smaller amplitudes and louder sounds have larger amplitudes.



Sounds travel in a wave. The vibrations make air particles closest to the object vibrate, which then passes the vibrations to the particle next to it and so on - like dominoes falling!



Forces and Magnets Quiz

1) How does sound travel?	
2) What measure do we use to describe how loud a sound is?	
3) What is pitch?	
4) What is the name of a famous scientist related to sound?	
5) Can you name 3 different parts of the ear?	
6) How are high and low pitch sounds created?	

Key Knowledge and vocabulary

Sound wave	A travelling disturbance that moves through space and matter. Waves transfer energy from one place to another.
Vibration	A rapid shaking motion.
Vocal cords	Two sets of tissue stretched across the larynx (upper part of the windpipe) which vibrate when air passes through the larynx to produce sound.
Vibrate	To move to and fro or up and down quickly and repeatedly.
Amplitude	A measure of how loud or quiet a sound is.
Absorb	The tendency of sound waves to be soaked up by a soft surface.
Sound particles	Air particles that bump into each other when a sound causes vibrations.
Sound source	What creates the vibrations which generate the sound waves, e.g. a ringing telephone, musical instrument or person's vocal cords
Pitch	A measure of how high or low a sound is.
Sound	What is heard when sound waves pass through a medium to the ear. All sounds are made by vibrations of molecules through which sound travels.
Transmit	Cause (something) to pass on from one person or place to another.
Decibel	A measure of how loud a sound is.
Volume	How loud or quiet a sound is.