Wellington Primary Science

Parental Information

Year Group – 4

Term – Spring

Topic – Sound

In the Sound project, your child will learn that sounds are vibrations that travel from sound sources, such as a person's vocal chords, musical instruments or pieces of machinery, through a solid, liquid or gas to the ears. They will explore the parts of instruments that vibrate to make sound and investigate the pitch, volume, distance and direction of sound. They will learn how sound waves are made and how they travel from a sound source to the ear. They will carry out research to find the answer to the question, 'How do we hear sounds?' and use diagrams and words, such as sound waves, vibrate, pinna, ear canal, eardrum, ossicles, cochlea and cochlear nerve, to record their findings. They will investigate the most effective ways to muffle sound and identify scenarios when muffling sound is important to prevent hearing damage. They will plan an investigation to learn how the volume of sound changes as they move away from a sound source and use a sound meter to measure the volume of sound. They will identify low and high-pitched sounds and then follow instructions to investigate the different ways the pitch of a sound can be changed. They will complete their learning by asking a scientific question about an aspect of sound that interests them before planning and carrying out an investigation to find the answer.

Your child will receive a copy of the knowledge organiser below to aid their learning. Please take time to look through this at home with your child.

Your child will be bringing home a 'Home Learning' guide and workbook, in which they can record home learning tasks for this topic. Included is a further reading suggestion list and some suitable child friendly websites, which can be used to deepen their understanding of the topics that they will be covering in class.

Class teachers will guide your child on activities which will directly support that week's learning and any homework expectations – there is no requirement for the children to complete all of the tasks in the pack.

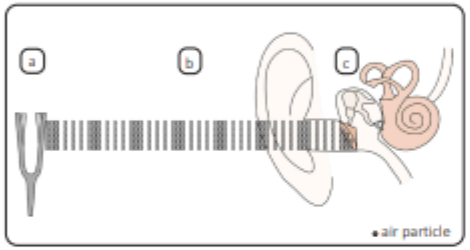
Should you have any questions please don't hesitate to contact the Year Group Team.

Sound

What is sound?

Sound is energy produced by vibrations from a sound source. Sound travels in waves through a medium, such as a solid, liquid or gas, to our ears. Most of the sound waves we hear travel through air, which is a gas. Where there is no medium for sound waves to travel through, such as in space, there is no sound.

How we hear sound



a. When energy is put into a sound source, it starts to vibrate, quickly moving back and forth repeatedly in a regular pattern.

b. These vibrations disturb the tiny particles of the medium that is close by, such as air, and they start to vibrate. They collide with the air particles next to them and pass the vibration energy along in sound waves.

c. When the sound waves enter the ear, they make the eardrum vibrate. These vibrations pass through small bones called ossicles and are turned into electrical signals in the spiral-shaped cochlea. These signals travel through the cochlear nerve to the brain and are interpreted as sounds.

Volume

The volume of a sound is how loud it is. It is measured in units called decibels (dB). Energy affects volume. The larger the force of energy put into the sound source, the louder the volume; the smaller the force, the quieter the volume. Distance also affects volume. The nearer the sound source, the louder the volume. The further away the sound source, the quieter the volume.

Pitch

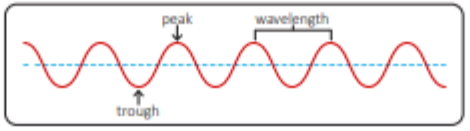
The pitch of a sound is how high or low it is. Pitch is measured in units called hertz (Hz). Humans can hear between 20 and 20,000 Hz but dogs can hear higher-pitched sounds. Fast vibrations produce high-pitched sounds, such as the sound of a whistle. Slow vibrations produce low-pitched sounds, such as the sound of a bass drum.

Representing sound waves

Sound waves can be represented by a wavy line in a sound wave diagram.

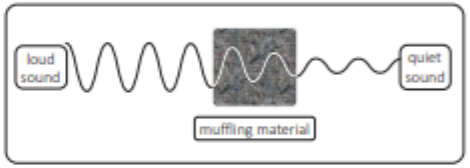
Volume is represented by the size of the peaks and troughs; large peaks and troughs represent a loud volume and small peaks and troughs represent a quiet volume.

Pitch is represented by the distance between each peak, called the wavelength. A long wavelength represents a low-pitched sound, and a short wavelength represents a high-pitched sound.



Muffling sound

Being exposed to very loud or continuous sounds can damage hearing. It can also lead to increased stress, tiredness and health problems. Materials that muffle sound absorb a lot of sound energy and reduce the volume of sound reaching our ears. Earplugs, ear defenders and soundproofing materials all muffle sound.



Glossary

cochlea	The spiral-shaped part inside the inner ear that turns vibrations into electrical signals.
eardrum	A thin layer of tissue inside the ear through which vibrations pass.
medium	A material, such as a solid, liquid or gas, that transfers energy from one place to another.
ossicles	Three tiny, linked bones inside the ear through which vibrations pass.
particle	A single piece of matter that is too small to be seen.
vibrate	To quickly move back and forth repeatedly.