



Sound – Year 4

Essential Knowledge (End Points):	<p>By the end of this unit of work children will be able to:</p> <ul style="list-style-type: none"> • 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. 		
Summary	<p>A sound produces vibrations which travel through a medium from the source to our ears. Different mediums such as solids, liquids and gases can carry sound, but sound cannot travel through a vacuum (an area empty of matter). The vibrations cause parts of our body inside our ears to vibrate, allowing us to hear (sense) the sound.</p> <p>The loudness (volume) of the sound depends on the strength (size) of vibrations which decreases as they travel through the medium. Therefore, sounds decrease in volume as you move away from the source. A sound insulator is a material which blocks sound effectively.</p> <p>Pitch is the highness or lowness of a sound and is affected by features of objects producing the sounds. For example, smaller objects usually produce higher pitched sounds.</p> <p>Pupils could explore and identify the way sound is made through vibration in a range of different musical instruments from around the world; and find out how the pitch and volume of sounds can be changed in a variety of ways.</p>	Vocabulary:	<p>Vibration – A movement backwards and forwards.</p> <p>Sound wave – Vibrations travelling from a sound source.</p> <p>Volume – The loudness of a sound.</p> <p>Amplitude – The size of a vibration. A larger amplitude = a louder sound.</p> <p>Pitch – How low or high a sound is.</p> <p>Ear – An organ used for hearing.</p> <p>Particles – Solids, liquids and gases are made of particles. They are so small we are unable to see them.</p> <p>Distance – A measurement of length between two points.</p> <p>Soundproof – To prevent sound from passing.</p> <p>Absorb sound – to take in sound energy. Absorbent materials have the effect of muffling sound.</p> <p>Vacuum – A space where there is nothing. There are no particles in a vacuum.</p> <p>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 each sound wave makes the eardrum vibrate.</p>
Prior learning/Understanding	<p>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. (Y1 - Animals, including humans)</p>	Working Scientifically Skills coverage:	<ul style="list-style-type: none"> • Asking relevant questions and using different types of scientific enquiries to answer them • Using straightforward scientific evidence to answer questions or to support their findings. • Identifying differences, similarities or changes related to simple scientific ideas and processes
Future Learning/understanding	<p>Waves on water as undulations which travel through water with transverse motion; these waves can be reflected, and add or cancel – superposition. (KS3)</p>		

	<ul style="list-style-type: none"> • Frequencies of sound waves, measured in Hertz (Hz); echoes, reflection and absorption of sound. (KS3) • Sound needs a medium to travel, the speed of sound in air, in water, in solids. (KS3) • Sound produced by vibrations of objects, in loud speakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal. (KS3) • Auditory range of humans and animals. (KS3) • Pressure waves transferring energy; use for cleaning and physiotherapy by ultra-sound. (KS3) • Waves transferring information for conversion to electrical signals by microphone. (KS3) 		<ul style="list-style-type: none"> • Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions <p>Pupils might work scientifically by:</p> <ul style="list-style-type: none"> • Finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses. • They might make earmuffs from a variety of different materials to investigate which provides the best insulation against sound. • They could make and play their own instruments by using what they have found out about pitch and volume.
Suggested activities /STEM Lab Opportunities	<ul style="list-style-type: none"> • Classify sound sources. • Explore making sounds with a range of objects, such as musical instruments and other household objects. • Explore how string telephones or ear gongs work. • Explore altering the pitch or volume of objects, such as the length of a guitar string, amount of water in bottles, size of tuning forks. • Measure sounds over different distances. • Measure sounds through different insulation materials. • Listen to sounds from different instruments around the world. 	Assessment tasks	<p>Ongoing teacher assessment/judgement.</p> <p>Pupil's may be able to:</p> <ul style="list-style-type: none"> • Explain what happens when you strike a drum or pluck a string and use a diagram to show how sounds travel from an object to the ear. • Demonstrate how to increase or decrease pitch and volume using musical instruments or other objects. • Use data to identify patterns in pitch and volume. • Explain how loudness can be reduced by moving further from the sound source or by using a sound insulating medium.
Key Local Links:	NA	Common Misconceptions:	<p>Children may think:</p> <ul style="list-style-type: none"> • Sound is only heard by the listener. • Sound only travels in one direction from the source. • Sound can't travel through solids and liquids. • High sounds are loud and low sounds are quiet. • Pitch and volume are frequently confused, as both can be described as high or low.



Component Statements

Identify how sounds are made

Children will:

- know that sounds can be made in a variety of ways (pluck, bang, shake, blow) using a variety of things (instruments, everyday materials, body).
- know that sound travels through different mediums such as air, water, metal
- associate sounds with something vibrating.

Recognise that vibrations from sounds travel through a medium to the ear.

Children will:

- know that a sound produces a vibration
- know that sounds can travel through solids, liquids and air/gas by making the materials vibrate.
- know that sound travel can be reduced by changing the material that the vibrations travel through.
- know that sound travel can be blocked.

Find patterns between the pitch of a sound and features of the object that produced it.

Children will:

- know that 'pitch' means how low or high a sound is.
- use data to identify patterns in pitch.
- know that sounds can be high or low pitched.
- know and demonstrate that the pitch of a sound can be altered.
- know that the pitch of a sound can be altered either by changing the material, tension, thickness or length of vibrating objects or changing the length of a vibrating air column.
- understand that the pitch of a sound is linked to the frequency of vibrations (sound energy) that produces it.

Find patterns between the volume of a sound and the strength of the vibrations that produced it.

Children will:

- know that 'volume' means how loud a sound is.
- use data to identify patterns in volume
- know that a sound produces a vibration
- demonstrate how to change the volume of a sound e.g. increase the size of vibrations by hitting or blowing harder
- understand that the volume of a sound is linked to the strength of vibrations (sound energy) that produces it.

Recognise that sounds get fainter as the distance from the sound source increases.

Children will:

- explore how sounds get fainter as the distance from the sound source increases.