Enriching lives every day; enabling our school community to learn, achieve and flourish through living 'life in all its fullness'

Sustainability

Subject: Science

Year group: 4

Term: Spring

Unit name: Sound

National curriculum:

- 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.

Prior Knowledge -

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)

Scientific enquiry	
Classifying	Identifying good amplifiers and insulators of sound
Observing over time	Not relevant
Pattern seeking	Finding patterns in sounds made by different size objects and in different thicknesses of elastic bands Order of pitch Patterns and similarities in data from investigations
Comparative/fair testing	Investigating best insulators Volume and how it can be impacted Sound and distance
Researching	How sound travels

Assessment for learning

Recapping prior knowledge- beginning of unit- what do children already know?

Beginning of each lesson- focus on recall of previous learning (quick quizzes)

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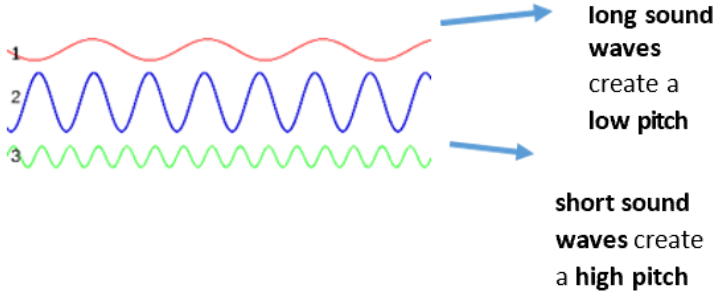
What should I already know?
• Hearing is one of my five senses. • Sounds can be combined using musical instruments. • What the word **vibration** means.

What will I know by the end of the unit?	
What is a sound?	A thing that can be heard. The object that makes the sound is called the **source**.
How is a sound made?	• 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 v**ibrations**. 
How do sounds **travel**?	• **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.

Diagrams

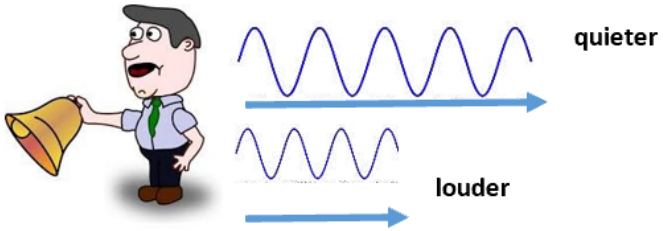
Pitch:

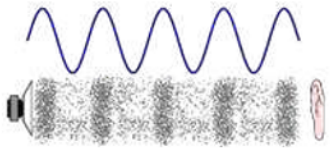
- **High pitch** sounds are created by short **sound waves**.
- **Low pitched** sounds are created by long **sound waves**.



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.



How do we hear sounds?	• When an object **vibrates**, the air around it **vibrates** too. This **vibrating** air can also be known as **sound waves**. • The **sound waves** travel to the ear and make the **eardrums vibrate**. • Messages are sent to the brain which recognises the **vibrations** as sounds. 

How do sounds change?	**Pitch:**
	• The **pitch** of a sound is how **high** or **low** it is.
	  • A squeak of mouse has a **high pitch**.
	  • A roar of a lion has a **low pitch**.
	Volume:
	• The **volume** of a sound is how **loud** or **quiet** it is.
	• When a sound is created by a little amount of **energy,** a weak **sound wave** is created which doesn't **travel** far. This makes a **quiet** sound.
	  • A small tap of a hammer is used with small amounts of **energy** and so creates a **quiet** noise.
	• A **vibration** with lots of **energy** makes a powerful **sound wave** and therefore a **loud** sound.

Vocabulary	
amplitude	a measure of the strength of a **sound wave**
decibel	a measure of how loud a sound is
electricity	a form of **energy** that can be carried by wires and in used for heating and lighting, and to provide power for devices
energy	the **power** from **sources** such as **electricity** that makes machines work or provides heat
frequency	a measure of how many times per second the **sound wave** cycles
medium	something that makes possible the transfer of **energy** from one location to another
pitch	how **high** or **low** a sound is
power	**Power** is energy, especially electricity, that is obtained in large quantities from a fuel **source** and used to operate lights, heating, and machinery
sound waves	invisible waves that travel through air, water, and solid objects as **vibrations**
source	where something comes from
transmit	to pass from one place or person to another
travel	how something moves around
vibrations	invisible waves that move quickly
volume	how **loud** or **quiet** a sound is

	• A powerful, smashing tap of a hammer is used with lots of **energy** and so creates a **loud** noise.
How do we measure sound?	• **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.

Investigate!
• Fill identical jars with different volumes of water. Which one creates the highest pitch? • Which material would make the best sound defender? How can you investigate this? • Make musical instruments using different length strings. How do their pitches differ?

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Lesson Sequence

1. Identify how sound is made

2. Explore how vibrations from sounds travel through a medium to the ear

3. Explore sound insulation

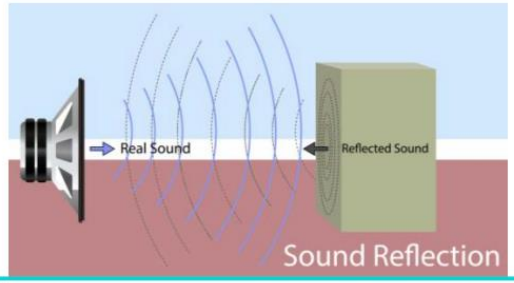
4. Explore volume

5. Explore pitch

6. Explore sounds

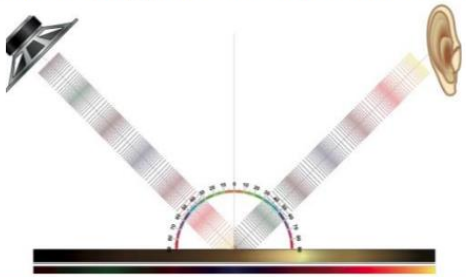
How sounds are made and travel

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. Sound waves travel through a medium (such as air, water, glass, stone, and brick).



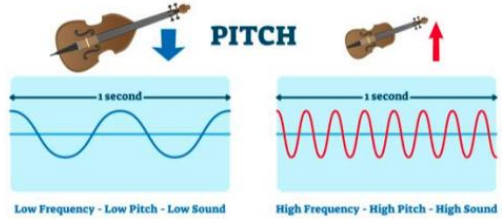
How do we hear?

The sound waves travel to the ear and make the eardrums vibrate. Messages are sent to the brain which recognises the vibrations as sounds.



Pitch

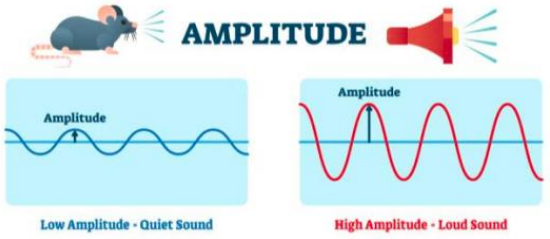
The pitch of a sound is how high or **low** it is. A squeak of mouse has a high pitch A roar of a lion has a low pitch.



A high pitch sound is made because it has a high frequency. The sound source vibrates many times a second.

Volume

The volume of a sound is how **loud** or **quiet** it is. Quieter sounds have a smaller **amplitude** and less energy (**smaller vibrations**) and louder sounds have a bigger amplitude and more energy. The **closer** we are to a sound source the louder it will be. A train arriving at a station sounds loud. The further away from a sound the fainter it will be. A train in the distance sounds quieter.



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