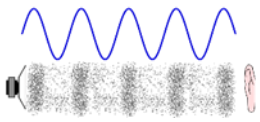
Oughterside Foundation School - Science

Topic: Sound	Year: 4	Strand: Physics

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 **vibrations**. 
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.
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. 

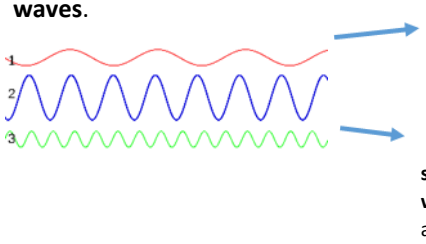
How do sounds change?	**Pitch:**
	• The **pitch** of a sound is how **high** or **low** it is.
	  • A squeak of mouse has a **high pitch**.
	  • A roar of a lion has a **low pitch**.
	Volume:
	• The **volume** of a sound is how **loud** or **quiet** it is.
	• When a sound is created by a little amount 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.
	  • 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.

Diagrams

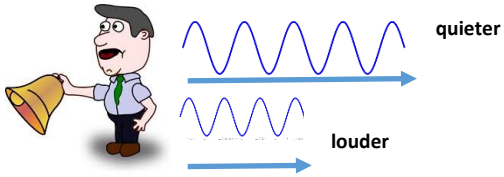
Pitch:

- **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.



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

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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Question 1: How does sound travel?	Start of unit:	End of unit:
In a straight line		
In a curvy line		
As a series of vibrations		
By making a noise		

Question 2: Sound travels…	Start of unit:	End of unit:
slower than the speed of light		
at the same speed as light		
faster than the speed of light		

Question 3: The volume of sound is measured in…	Start of unit:	End of unit:
decibels		
centimetres		
kilograms		
miles		

Question 4: Sounds gets louder… (tick 2)	Start of unit:	End of unit:
as we move further away from the source		
as we move closer to the source		
the less energy there is when creating the sound		
the more energy there is when creating the sound		

Question 5: On a stringed musical instrument, the pitch can be changed by…	Start of unit:	End of unit:
hitting the string harder		
hitting the string softer		
tightening the string		
loosening the string		

Question 6: The origin of the sound is called the…	Start of unit:	End of unit:
noise		
source		
vibration		
frequency		

Question 7: The pitch of a sound describes…	Start of unit:	End of unit:
how fast or slow a sound is		
how loud or quiet a sound is		
how low or high a sound is		

Question 8: When a sound hits the ear...	Start of unit:	End of unit:
nothing vibrates		
the whole ear vibrates		
the eardrums vibrate		
the brain vibrates		

Question 9: Sound can travel through…	Start of unit:	End of unit:
the air		
water		
the floor		
all of the above		

Question 10: A pupil blows through two different length straws. Which statement is true?	Start of unit:	End of unit:
The shorter straw will make a higher-pitched sound.		
The shorter straw will make a louder sound.		
The longer straw will make a higher-pitched sound.		
The longer straw will make a louder sound.		