Year 4 Science organiser – Summer 1

Do we all hear the same things?

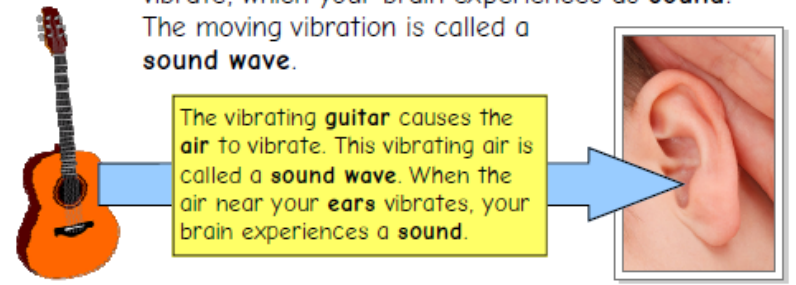
Key Vocabulary	
vibration	A movement backwards and forwards.
sound wave	Vibrations travelling from a sound source.
volume	The loudness of a sound.
amplitude	The size of a vibration. A larger amplitude = a louder sound.
pitch	How low or high a sound is.
ear	An organ used for hearing.
particles	Solids, liquids and gases are made of particles. They are so small we are unable to see them.
distance	A measurement of length between two points.
soundproof	To prevent sound from passing.
absorb sound	To take in sound energy. Absorbent materials have the effect of muffling sound.
vacuum	A space where there is nothing. There are no particles in a vacuum.

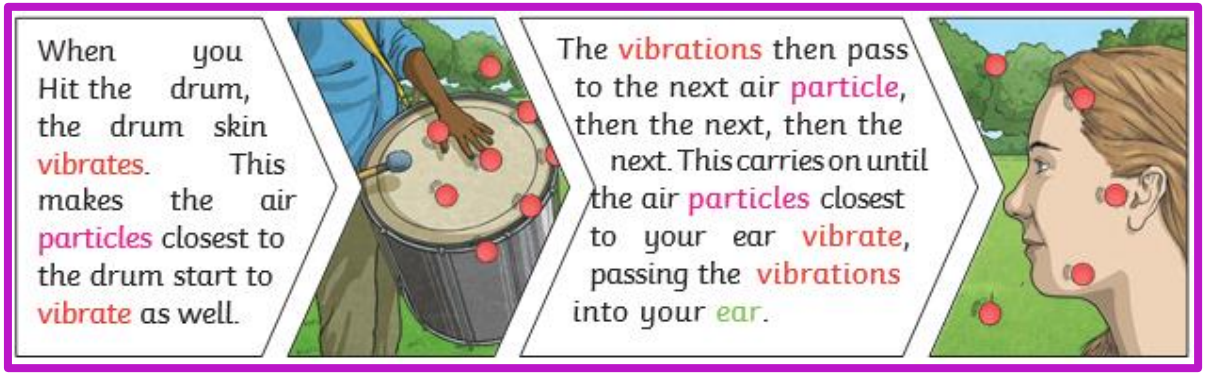
Key knowledge

Sound can travel through solids, liquids and gases. Sound travels as a wave, vibrating the particles in the medium it is travelling in. Sound cannot travel through a vacuum.
Sound is a type of energy. Sounds are created by vibrations. The louder the sound, the bigger the vibration.

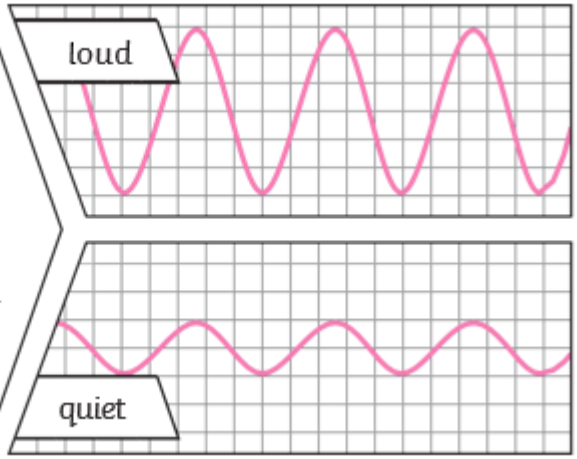
How sound is made

Sound is caused by **vibration**. Vibration means **wobbling** very quickly back and forth. When you pluck a guitar string, or hit a drumskin, you can see the material vibrate. This causes the **air** touching the string to vibrate, which causes air further away to vibrate, which causes the air near your **ear** to vibrate, which your brain experiences as **sound**. The moving vibration is called a **sound wave**.





The size of the vibration is called the amplitude. Louder sounds have a larger amplitude, and quieter sounds have a smaller amplitude.



Pitch is a measure of how high or low a sound is. A whistle being blown creates a high-pitched sound. A rumble of thunder is an example of a low-pitched sound.

You can change the pitch of a sound in different ways depending on the type of instrument you are playing.

For example, if you are playing a xylophone, striking the smaller bars with the beater causes faster vibrations and so a higher pitched note. Striking the larger bars causes slower vibrations and produces a lower note.

How our ears work

When a sound wave reaches our ear, our **outer ear** (the part that we can see on the side of our heads) funnels the sound into our heads down the **ear canal**. At the end of the ear canal is the **eardrum**, which is waterproof and airtight. Past the ear canal is the **middle ear**. Inside the middle ear are the **hammer**, **anvil** and **stirrup** (the three smallest bones in the body) which vibrate and pass the sound waves to the **inner ear**, which contains the **cochlea**, which turns the vibrations into **electrical signals**. These signals travel down the **auditory nerve** to the **brain**, which experiences the signal as **sound**.