

Pye Bank CE Primary DSAT Knowledge Organiser

YEAR 4

PHYSICS: SOUND

SCIENCE

KEY VOCABULARY

- Amplitude:** a measure of the strength of a sound wave.
- Decibel:** a measure of how loud a sound is.
- 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.
- Particles:** Solids, liquids and gases are made of particles. They are so small we are unable to see them.
- Pitch:** how high or low a sound is.
- Power:** is energy, especially electricity that is obtained in large quantities from a fuel source and used to operate lights, heating, and machinery.
- Soundwaves:** 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.
- Vacuum:** a space where there is nothing. There are no particles in a vacuum.

KEY SCIENTIST

Robert Boyle 1627–1691

Figured out that sound needs a **medium** to travel through. He placed an alarm clock in a jar and sucked the air out, creating a vacuum inside.



Gradually, you hear the clock quietening and then silencing completely, proving that sound needs air (or another medium).

Alexander Graham Bell 1847– 1922

Experimented with sound from his teenage years. He taught his dog to growl continuously, then manipulated its lips and vocal cords to make it sound like it was saying, 'How are you grandma?'. He spent his life investigating the transmission of sound waves, and eventually invented the telephone, using electrical undulations to **transmit** sound waves.



STICKY KNOWLEDGE

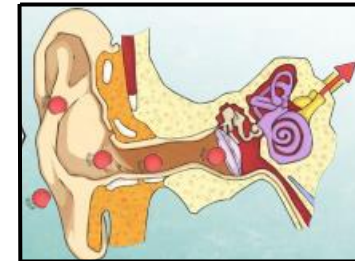
1. Sound is a type of **energy**. Sounds are created by **vibrations**. The louder the sound, the bigger the **vibration**.
2. Sound can **travel** through solids, liquids and gases. Sound travels as a wave, vibrating the particles in the medium it is travelling in. Sound cannot travel through a vacuum.
3. Sound travels in multiple directions. Sound is vibration, so when one particle vibrates, all others around it will vibrate, passing it on to all surrounding molecules.
4. When you throw a stone in a pond, it will produce ripples. As the ripples spread out across the pond, they become smaller. When sound **vibrations** spread out over a distance, the sound becomes quieter, just like the ripples in a pond.



KEY CONCEPT

How Sound is Made

- Like light, sound travels through the air in waves.
- Sound is made by air molecules vibrating.
- When you clap your hands, the air around your hands shakes. This is the air **particles** vibrating.

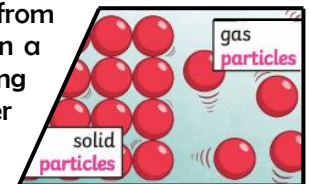


When air **particles** inside the ear vibrate, they shake tiny hairs on the insides of the ears. The hairs are connected to nerves under the skin.

These nerves send messages to your brain to tell you that you heard a noise. Sound travels much slower than light, whether in air or in water. You often hear things after you see them, for example you see the lightning before you hear the thunder.

KEY CONCEPT

Sound **energy** can travel from particle to particle far easier in a solid because the vibrating **particles** are closer together than in other states of matter like gas.



The size of the vibration is called the **amplitude**. Quieter sounds have a smaller amplitude, and louder sounds have a bigger amplitude.