Science Knowledge Organiser

Year 4

Autumn (ii)

How can we produce and alter sound?

Portable Knowledge -

Vibration travels through a medium to the ear.
Pitch is the highness or lowness of a sound; volume is the loudness or quietness of a sound.
Sounds get fainter as the distance from the sound source increases.

To know how sounds are made associating some of them with vibration.

Sound is a type of energy. Sounds are created by vibrations. The louder the sound, the bigger the vibration.

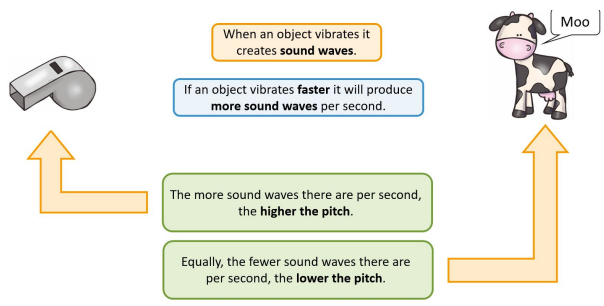
To know that vibration travels through a medium to the ear.

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 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.

Inside your ear, the vibrations hit the eardrum and are then passed to the middle and then the inner ear. They are then changed into electrical signals and sent to your brain. Your brain tells you that you are hearing a sound.

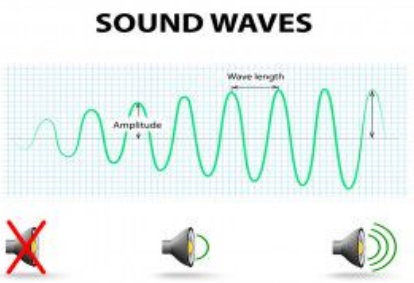
To know patterns between the pitch of a sound and features of the object that produced the vibration.



When an object vibrates slowly it produces a lower pitch.
When an object vibrates quickly it produces a higher pitch.

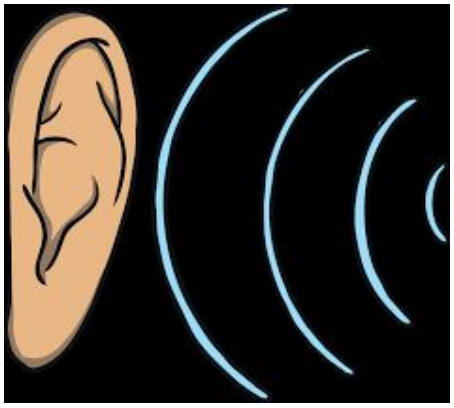
The longer and wider the object is, the clower it will vibrate, and the lower its pitch will be.
The higher the tension of the object, the faster it will vibrate, and the higher its pitch will be.

To know patterns between the volume of a sound and the strength of the vibrations which produced it.



The larger the vibration the greater the pressure change, the larger the amplitude, the louder the sound. Therefore, the greater the distance the particles move, the louder the sound. Thus, the loudness of a sound depends on the intensity (amount of energy) the sound wave carry.

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



The further the vibrations travel, the more they spread out. As they spread out through more and more particles, the vibrations become smaller and smaller. This causes the sound to get quieter and quieter. Sounds also get quieter over distance because some of the vibrations are absorbed by obstacles they meet.

To explore and identify the way sound is made through vibration in a range of different musical instruments from around the world.

Music is a special kind of sound that is pleasant to listen to. Musical instruments create sounds by making something vibrate. For example, guitars make sound when their strings vibrate. Most instruments are "tuned" to make a range of sounds of particular frequencies, which we call notes. These notes are made in a particular sequence to play a piece of music. Although the pitch (how high or low a sound is) will be the same, a particular note sounds different on different instruments because they produce sound waves with different patterns (shapes and sizes).

Bigger instruments tend to make lower and louder notes than small ones.

Core vocabulary

Vibration – is the rapid back-and-forth movement of physical particles, as a reaction to different forces.

Medium – is the material that the sound travels through.

Pitch – describes how high or low a sound is. Pitch depends on how fast or slow an object is vibrating.