

What Is Sound?

Sound is caused by objects vibrating. Sometimes we can see the vibrations. Think about a guitar string being plucked, for example. Sometimes we can feel the vibrations. Try singing a note and putting your fingers to your throat. Can you feel your voice box vibrate as you make the sound? However, even if you can't see a vibration, if you hear a sound, you can be sure that it is there.

But how does the vibration become a sound which we can hear? The vibration needs to travel to your ear. Sound needs a material to travel through. It can travel through gases like air, liquids like water or solids like wood. The vibration is passed from particle to particle through the material as what is called a sound wave. When the sound waves reach your ear, it causes a tiny skin called the eardrum to vibrate. The vibration passes through the ear and a message is sent to the brain. The brain interprets the information as sound.

Did you know that there are no sounds in space? This is because space is a vacuum which means there is no air. With no air to travel through, there cannot be any sound.

Loud and Quiet Sounds

The volume of a sound depends on the size – or amplitude - of the sound wave. Large vibrations or sound waves are heard as loud sounds. However, as you move away from the source of the sound, the volume decreases. This is because the sound waves spread out and become fainter.

The human ear can hear sounds with a wide range of volumes. However, they can be damaged by very loud sounds. That's why it is important to look after our ears. You may have seen people wearing ear defenders at noisy building sites for example.

High and Low Sounds

The pitch of a sound means how high or low it is. The speed a sound wave vibrates at is known as frequency. High sounds are caused by very quick vibrations - called high frequency sounds. Low sounds are caused by slower vibrations. These are called lower frequency sounds. Pitched musical instruments are designed to allow the player to change the pitch of the note they are playing. A violinist presses the string down with



their finger. This shortens the string and it therefore vibrates faster. Bigger instruments, like double basses or tubas make lower sounds than smaller instruments like violins or flutes. This is because larger objects result in slower vibrations.

The human ear is wonderful at detecting different pitches. That's why we can enjoy music. However, some sounds are too high or low for us to hear. As we age, we also find it harder to hear higher pitches. Some animals can hear sounds that are too high or low for us. Maybe you have seen someone blowing a dog whistle to summon a dog. It seems like the whistle isn't making any sound. It is – but the pitch is too high for us to hear. Meanwhile, elephants can hear much lower frequency sounds than humans.

SUMMARISE FOCUS

1. Use the whole text to summarise these key terms:

Sound Wave:

Amplitude:

Pitch:

Frequency:

2. The section called 'High and Low Sounds' has two different paragraphs. Give each paragraph a subtitle to summarise the different content.

VIPERS QUESTIONS

R

True or False: Sound can only travel through air.

V

Find a word which means *gets lower*.

R

How does hearing change as we get older?

V

What does *summon* mean?

P

Using the text, predict which of these instruments from the oboe family is likely to be able to make the lowest sound.

