

Sound Speed and Frequency

3U Physics

The speed at which a wave propagates is dependent upon the _____
of the _____.

Remember that sound is a _____ wave.

A _____ (e.g. of a tuning fork) bumps air particles, which bump the air particles next to them, etc.

Sound travels faster in _____ air (in which the particles are _____):

Example: You see a flash of lightning from a storm 1.4 km away and hear the crack of lightning 4.0 s later. What is the temperature of the air?

And sound will also travel faster in _____ materials (liquids and solids).

E.g. the speed of sound in water is typically 1500 m/s. A swimmer 1500 m away from a loud sound would hear it the sound 1 s later through the water or more than 4 s later through the air.

Example: A dolphin sends out a pulse at a frequency of 100 000 Hz and hears an echo back from an object 2.4 s later. How far away is the object?

Note that the _____ of the sound doesn't matter!

The frequency of any sound wave is always the frequency of the _____ and does *not* _____ or _____ of the wave as it propagates.

(Changing the speed will change the _____, not the frequency.)

Humans can hear sounds between about _____ and _____ Hz.

Most human speech is between _____ and _____ Hz, and the ear is most sensitive to frequencies between _____ and _____ Hz.

Sound above _____ Hz is called _____.

A common use of ultrasound is _____ under water:
i.e. echolocation or sonar.

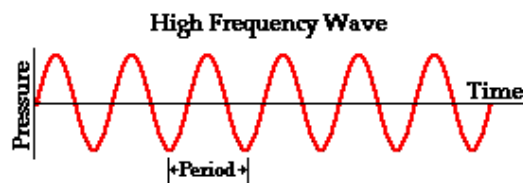
Sound below 20 Hz is called _____.

While humans cannot consciously detect these frequencies, they may still be sensitive to the _____.



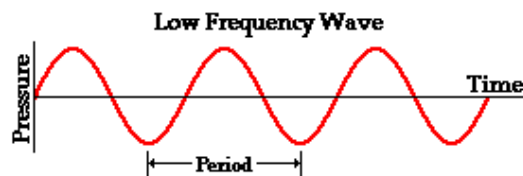
Within the audible range, frequency of a sound wave is commonly referred to as the _____ of the sound:

A high-frequency sound wave has a _____.



A low-frequency sound wave has a _____.

A sound wave of a single frequency will be heard as a distinct _____.



Irregular sound waves will be heard as _____.

