

## Background Information for Teachers

**Sound Waves:** A wave carries energy from one place to another. A wave does not carry material. Sound is energy made from vibrating objects. The mechanical energy of sound travels in waves as it moves through solids, liquids, and gases away from the vibrating object. Sound cannot travel through a vacuum.

**Vibration:** When you pluck the string of a guitar, the elastic wave travels to the end of the string and bounces to travel back and forth the full length of the string making a vibration. The wood begins to vibrate at the same rate, which causes the air to vibrate in sound waves that we can hear.

**Pitch:** Pitch is the degree of highness or lowness of the sound as heard by the listener. An object that vibrates quickly has a higher pitch of sound as an object that vibrates slowly. Smaller objects vibrate faster than larger ones.

**Loudness:** The loudness of sound is how strong the sound seems to us when it strikes our ears. Loud sounds have more energy than soft sounds. Waves spread out from the source in all directions like waves from a pebble in a pond. The loudness decreases as you get farther away from the sounds.

Sound is around us all the time. The air makes it possible for us to communicate with each other by speaking and hearing. The human ear has an eardrum which vibrates with sound waves. These vibrations cause vibration in a chain of 3 bones, the hammer, anvil and stirrup. The bones act like a lever so that the stirrup sends stronger vibrations to the cochlea. There is fluid inside the cochlea which vibrates and cells inside the cochlea change the vibrations to electric signals. These electric signals travel the auditory nerve to the brain. The brain interprets these signals as sounds.