

Name _____

Exploring the World of Sound: What Is Sound?

Short Answer Key

1. The eardrum (tympanic membrane) receives sound waves and vibrates in response to them. These vibrations are then transmitted to the tiny bones in the middle ear, amplifying the sound before reaching the inner ear.
2. The three tiny bones in the middle ear (malleus, incus, and stapes) serve to amplify the vibrations received from the eardrum and transmit them to the inner ear. They act as a mechanical amplification system.
3. High-frequency sound waves have more cycles or vibrations per second, leading to a higher pitch. They have shorter wavelengths and are associated with high-pitched sounds. In contrast, low-frequency sound waves have fewer cycles per second, resulting in a lower pitch. They have longer wavelengths and are associated with low-pitched sounds.
4. An example of an application of sound in the field of science is "ultrasound imaging." Ultrasound uses sound waves to create images of the inside of the body. A transducer emits high-frequency sound waves into the body, and the echoes produced by bouncing off internal structures are used to create real-time images of organs, fetuses, and other tissues. It is widely used for medical diagnosis and monitoring.
5. Echolocation in animals like bats and dolphins involves emitting sound waves (usually high-frequency) into the environment. These animals listen for the echoes produced when the sound waves bounce off objects in their surroundings. By analyzing the time it takes for the echoes to return and their intensity, these animals can determine the location, size, shape, and even movement of objects. The primary purpose of echolocation is navigation, hunting, and locating prey in their environments.

