Name _____

Speed of Sound: A Sonic Adventure through Different Materials

Short Answer Key

1. The speed of sound in air changes with temperature because warmer air has air molecules that move more quickly, resulting in faster sound propagation. Conversely, colder air has slower-moving molecules, leading to slower sound speeds.
2. In freshwater, sound travels at approximately 1,480 meters per second, while in seawater, it travels at about 1,530 meters per second. The difference is due to the increased density of seawater caused by dissolved salts, which allows sound waves to propagate more efficiently.
3. Sound travels faster in solid materials because the particles in solids are closely packed, allowing for efficient transmission of sound waves.

   Additionally, solids are typically more elastic, enabling them to quickly return to their original shape after being disturbed by sound waves.

4. One possible real-life application is in the construction of buildings and bridges. Understanding the speed of sound in different construction materials is essential for designing structures that can withstand seismic waves or detect structural defects.
5. Humidity affects the speed of sound in air because the presence of water vapor molecules can slow down the movement of sound waves, causing sound to travel more slowly in humid air.