

Chapter 10.1: Characteristics of Sound Waves

1. Nature of Sound

- **Sound as Energy:** Produced by vibration.
- **Example:** Musical instruments produce sound through vibration.
- **Observation:** Feel the vibration of your vocal cords by touching your throat while speaking.

Example Sentence: Sound is a form of energy that is created by vibrations, such as those produced by musical instruments.

2. Transfer of Sound

- **Medium Requirement:** Sound requires a medium to propagate (liquid, solid, or gas).
- **Example:** A bell ringing causes the metal to vibrate, which in turn causes nearby air molecules to vibrate and transfer sound.

Example Sentence: Sound cannot travel through a vacuum because it needs a medium like air, water, or solids to propagate.

3. Speed of Sound in Different Media

- **Solids:** Sound transfers very rapidly because particles are closely packed.
- **Liquids:** Sound transfers less rapidly compared to solids due to the loose arrangement of particles.
- **Gases:** Sound propagates very slowly because gas particles are far apart.

Example Sentence: Sound travels faster in solids than in liquids and gases due to the close proximity of the particles in solids.

4. Reflection and Absorption of Sound

- **Reflection:** Sound bounces back when it hits hard and smooth surfaces.

- Examples: Marble tiles, walls
- **Absorption:** Sound is absorbed by soft and rough surfaces.
 - Examples: Carpet, softboard

Example Sentence: Hard surfaces like walls and marble tiles are good reflectors of sound, while soft surfaces like carpets and softboards are good absorbers of sound.