

Name _____

Waving Hello to Differences: Transverse and Longitudinal Waves

Short Answer Key

1. To create a transverse wave using a rope, you can shake one end of the rope up and down. The rope will move in a wavy pattern, with crests and troughs. The particles in the rope will move vertically, perpendicular to the direction of the wave.
2. Understanding the difference between transverse and longitudinal waves is important in designing and using medical ultrasound machines. These machines use sound waves to create images of the inside of the human body, and the knowledge of wave properties helps in obtaining accurate and detailed images.
3. In a sound wave, air particles move back and forth in the same direction as the sound's path. This motion creates regions of compression (where particles are crowded together) and rarefaction (where particles are spaced out), which is why sound waves are considered longitudinal.
4. The propagation of a longitudinal wave can differ when it travels through different mediums. In a solid, the particles are closely packed, so the wave travels faster compared to a gas, where the particles are more spread out.
5. An example of a wave that does not fit neatly into the categories of transverse or longitudinal is a water wave. While it exhibits properties of both types, it is often considered a combination of transverse and longitudinal motion due to the complex interactions of water particles.

