Name _____

The Ripple Effect: Understanding Mechanical Waves

Short Answer Key

1. Transverse Waves: In a transverse wave, particles move perpendicular to the wave's direction. An example is a rope or string being wiggled up and down, creating waves. The motion of particles is side to side or up and down, with crest and trough representing high and low points.

   Longitudinal Waves: In a longitudinal wave, particles move parallel to the wave's direction. An example is sound traveling through air. The particles compress and rarefy in the same direction as the wave, creating areas of high pressure (compression) and low pressure (rarefaction).

2. In a transverse wave, particles transfer energy by pushing and pulling the adjacent particles. The amplitude of a wave measures its intensity or the amount of energy it carries. Larger amplitudes represent more energy, while smaller amplitudes represent less energy.
3. A slinky being compressed and stretched illustrates a longitudinal wave. When the slinky is compressed, it creates a region of compression where particles are close together. When it's stretched, it creates a region of rarefaction where particles are spread out. This alternation between compression and rarefaction allows the wave to propagate through the medium.
4. The speed of a mechanical wave depends on the properties of the medium through which it travels. Sound waves, for example, travel faster through solids than gases because solids have denser particles. The speed of a wave is also influenced by temperature, pressure, and humidity in gases.
5. If a wave has a high frequency, it has a short wavelength. An example of a high-frequency wave from everyday life is a microwave oven, which uses high-frequency microwaves to heat food. These microwaves have short wavelengths.