

Here is a comprehensive quiz based on **Lesson 1: Wave Properties.**

Part 1: Multiple Choice (15 Questions)

- 1 **What is a wave?**
 - ☐ A) A movement of matter from one place to another.
 - ☐ B) A disturbance that transfers energy without moving matter.
 - ☐ C) A vibration that only travels through a vacuum.
 - ☐ D) A stationary object that produces sound.
- 2 **Most waves originate from which of the following?**
 - ☐ A) Heat
 - ☐ B) Static electricity
 - ☐ C) A vibration
 - ☐ D) A vacuum
- 3 **Which type of wave requires a medium (solids, liquids, or gases) to travel?**
 - ☐ A) Electromagnetic waves
 - ☐ B) Mechanical waves
 - ☐ C) Light waves
 - ☐ D) Radio waves
- 4 **A transverse wave is defined as a wave where the disturbance is:**
 - ☐ A) Parallel to the direction of travel.
 - ☐ B) Perpendicular to the direction of travel.
 - ☐ C) Moving in a circular path.
 - ☐ D) Stationary.
- 5 **Which of these is an example of a transverse wave?**
 - ☐ A) Sound waves
 - ☐ B) A flag blowing in the wind
 - ☐ C) Ultrasound
 - ☐ D) Pushing a spring back and forth
- 6 **In a longitudinal wave, the areas where the particles are closest together are called:**
 - ☐ A) Rarefactions
 - ☐ B) Troughs
 - ☐ C) Crests
 - ☐ D) Compressions
- 7 **Sound waves are a type of:**
 - ☐ A) Transverse wave
 - ☐ B) Longitudinal wave

- C) Circular wave
- D) Electromagnetic wave
- 8 **Through which medium do sound waves travel when you hear someone calling your name underwater?**
 - A) Solid
 - B) Liquid
 - C) Gas
 - D) Vacuum
- 9 **Water waves are unique because they combine:**
 - A) Heat and light motion
 - B) Magnetic and electric motion
 - C) Transverse and longitudinal motion
 - D) Only up-and-down motion
- 10. **Seismic waves are created by:**
 - A) Wind transferring energy to water
 - B) Rocks shifting rapidly along a fault
 - C) Striking a tuning fork
 - D) A smartphone alarm
- 11. **Amplitude is defined as:**
 - A) The distance between two crests.
 - B) The maximum distance a wave travels from its resting position.
 - C) The speed at which a wave travels.
 - D) The number of waves produced in one second.
- 12. **The relationship between wave energy and amplitude is:**
 - A) Energy is equal to the amplitude.
 - B) Energy is half of the amplitude.
 - C) Energy is the square of the amplitude.
 - D) There is no relationship.
- 13. **If you double the amplitude of a wave, the energy increases by:**
 - A) Two times
 - B) Three times
 - C) Four times
 - D) Ten times
- 14. **How we perceive the energy of a sound wave is known as:**
 - A) Intensity
 - B) Pitch
 - C) Loudness

○ D) Frequency

15. **The unit used to measure sound intensity is:**

- A) Meters (m)
 - B) Newtons (N)
 - C) Decibels (dB)
 - D) Hertz (Hz)
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Part 2: True or False (5 Questions)

- 1 **True or False:** Mechanical waves can travel through a vacuum (empty space).
 - 2 **True or False:** In a longitudinal wave, particles move parallel to the direction of the wave.
 - 3 **True or False:** When a vibrating object stops, all existing waves it produced immediately disappear.
 - 4 **True or False:** A tsunami is a wave that can move large amounts of water in all directions.
 - 5 **True or False:** Every 10 dB increase in sound intensity makes a sound seem twice as loud.
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Part 3: Short Answer (10 Questions)

- 1 Define the term **vibration**.
- 2 What is a **medium** in the context of mechanical waves?
- 3 Describe the motion of a rope when a transverse wave passes through it.
- 4 Explain what happens during a **rarefaction** in a longitudinal wave.
- 5 Why can you hear a knock on a door from the other side? (Describe the energy transfer).
- 6 How does wind create water waves?
- 7

- 8 What is the difference between a low rumble of thunder and a loud boom in terms of amplitude?
- 9 If the amplitude of a wave is halved what happens to the energy it carries?
10. Explain why a sound gets quieter as you move further away from the source.
11. Why is it dangerous to listen to very high decibel levels for a long time?