

## Waves Quiz Answer Key PDF

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#### What is the unit of frequency?

- A. Meters
- B. Seconds
- C. Hertz ✓**
- D. Joules

#### What type of wave requires a medium to travel through?

- A. Electromagnetic Wave
- B. Mechanical Wave ✓**
- C. Transverse Wave
- D. Longitudinal Wave

#### Provide an example of how the Doppler Effect is observed in everyday life.

**An example of the Doppler Effect in everyday life is the change in pitch of a passing ambulance's siren, which sounds higher as it approaches and lower as it moves away.**

#### How does diffraction differ from refraction?

**Diffraction differs from refraction in that diffraction refers to the bending of waves around obstacles, whereas refraction is the bending of waves when they enter a different medium.**

#### Why can't sound waves travel through a vacuum?

**Sound waves cannot travel through a vacuum because there are no particles to carry the sound vibrations.**

**Describe how amplitude affects the energy of a wave.**

**The energy of a wave increases with the square of its amplitude.**

**What happens when two waves meet and combine to form a larger wave?**

- A. Destructive Interference
- B. Constructively Interference ✓**
- C. Diffraction
- D. Reflection

**Which type of wave is light?**

- A. Mechanical
- B. Longitudinal
- C. Electromagnetic ✓**
- D. Surface

**Which of the following factors affect the speed of a wave? (Select all that apply)**

- A. Medium ✓**
- B. Amplitude
- C. Frequency ✓**
- D. Wavelength ✓**

**What phenomenon explains the change in frequency of a wave relative to an observer moving towards or away from the source?**

- A. Wave-Particle Duality
- B. Doppler Effect ✓**
- C. Reflection
- D. Refraction

**Which phenomena involve the bending of waves? (Select all that apply)**

- A. Reflection
- B. Refraction ✓**

**C. Diffraction** ✓

D. Interference

**What occurs when a wave bends as it enters a different medium?**

A. Reflection

**B. Refraction** ✓

C. Diffraction

D. Interference

**What is the relationship between wave speed, frequency, and wavelength?**

A.  $v = f + \lambda$

**B.  $v = f \times \lambda$**  ✓

C.  $v = f / \lambda$

D.  $v = \lambda / f$

**Which of the following is an example of a longitudinal wave?**

A. Light wave

B. Water wave

**C. Sound wave** ✓

D. Radio wave

**Which of the following are types of mechanical waves? (Select all that apply)**

**A. Sound waves** ✓

B. Light waves

**C. Water waves** ✓

D. Radio waves

**Explain the difference between transverse and longitudinal waves.**

**Transverse waves, such as light waves, move in a direction that is perpendicular to the oscillation of the medium, whereas longitudinal waves, like sound waves, move in a direction that is parallel to the oscillation of the medium.**

**Discuss the significance of wave-particle duality in modern physics.**

**Wave-particle duality signifies that particles can behave as both waves and particles, which is essential for the development of quantum mechanics and our understanding of the fundamental nature of matter and energy.**

**Which characteristics are true for sound waves? (Select all that apply)**

- A. They are transverse waves.
- B. They require a medium. ✓**
- C. They can travel through a vacuum.
- D. They are longitudinal waves. ✓**

**Which statements are true about wave-particle duality? (Select all that apply)**

- A. It applies only to light waves.
- B. It is a concept in quantum mechanics. ✓**
- C. It describes waves exhibiting particle properties. ✓**
- D. It is only applicable to sound waves.

**Which of the following are correct expressions of the wave equation? (Select all that apply)**

- A.  $v = f \times \lambda$  ✓**
- B.  $f = v / \lambda$  ✓**
- C.  $\lambda = v / f$  ✓**
- D.  $v = \lambda \times f$