

Name: _____ Date: _____

A Sonic Boom in the Kitchen: 10th Grade Wave Physics Quiz

Identify core differences between seismic mechanical waves and electromagnetic radiation while calculating basic wave speed and frequency relationships.

1. When a specialized sonar device pulses underwater to map the seafloor, what type of wave is primarily being utilized?

- A. Electromagnetic transverse wave
- B. Mechanical longitudinal wave
- C. Gravitational constant wave
- D. Surface water wave only

2. Light waves from a remote star are capable of traveling through the vacuum of space because they do not require a physical medium.

- A. True
- B. False

3. The _____ of a wave is defined as the number of complete cycles that pass a stationary point in one second.

- A. Amplitude
- B. Wavelength
- C. Frequency
- D. Period

4. Why does a straw appearing in a glass of water look 'broken' at the water's surface?

- A. Diffraction around the straw edges
- B. Reflection off the glass surface
- C. Total internal measurement
- D. Refraction due to change in wave speed

5. In a transverse wave, the individual particles of the medium move _____ to the direction of the wave's energy transfer.

- A. Parallel
- B. Perpendicular
- C. In a circular motion
- D. In the opposite direction

6. Increasing the amplitude of a sound wave will directly result in a higher pitch heard by the human ear.

- A. True
- B. False

Name: _____ Date: _____

7. Which of these represents the correct relationship between wave speed (v), frequency (f), and wavelength (λ)?

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

8. When an opera singer maintains a note that causes a crystal glass to vibrate and eventually shatter, the phenomenon is called ____.

- A. Resonance
- B. Polarization
- C. Interference
- D. Attenuation

9. Blue light has a shorter wavelength and higher frequency compared to red light on the visible spectrum.

- A. True
- B. False

10. If you are standing on a train platform and a whistling train speeds away from you, how does the sound change for you?

- A. The frequency appears to increase
- B. The wavelength appears to decrease
- C. The pitch appears to drop
- D. The speed of sound increases