



Name: \_\_\_\_\_

Class: \_\_\_\_\_

Date: \_\_\_\_\_

## Worksheet: Mechanical Wave

**Read each question carefully. Choose the best answer from the given options.**

1. In science class, students learn that some waves require a material to move through in order to exist and transfer energy. Which statement best describes a mechanical wave based on this idea?  
a. It can travel through empty space.      b. It transfers matter from place to place.  
c. It needs a medium to transfer energy.      d. It produces light and heat only.
  
2. When a mechanical wave travels through a medium such as water, air, or a rope, something is passed from one point to another without permanently moving the particles. What do mechanical waves mainly transfer?  
a. Medium      b. Matter      c. Particles      d. Energy
  
3. Mechanical waves are different from light waves because they cannot move through empty space. What is the correct scientific reason why mechanical waves cannot travel in a vacuum?  
a. There is no gravity present.      b. There are no particles to vibrate.  
c. The speed becomes too high.      d. The amplitude becomes zero.
  
4. A piece of wood is floating on the surface of water when waves pass by. The wood does not move across the water but changes position repeatedly. What happens to a floating object when a water wave passes?  
a. It moves forward with the wave.      b. It sinks slowly downward.  
c. It stays completely still.      d. It moves up and down.
  
5. Sound is a type of mechanical wave that needs particles in order to travel. Which of the following media can carry sound waves from one place to another?  
a. Space      b. Light      c. Air      d. Vacuum
  
6. In a diagram of a transverse wave, one point is shown as the highest position reached by the vibrating particles above the equilibrium position. What is this highest point called?  
a. Trough      b. Crest      c. Wavelength      d. Amplitude
  
7. When studying wave diagrams, students often measure the horizontal distance from one crest to the next crest. What wave property does this distance represent?  
a. Frequency      b. Period      c. Amplitude      d. Wavelength
  
8. Two waves travel through the same medium, but one wave has taller crests and deeper troughs than the other. What does this difference in wave height indicate?  
a. Wave speed      b. Wave type      c. Wave energy      d. Wave frequency
  
9. A teacher explains that some waves pass a point quickly while others pass more slowly. The term used to describe how many complete waves pass a point in one second is called \_\_\_\_\_.  
a. Period      b. Frequency      c. Wavelength      d. Amplitude
  
10. When measuring how many waves pass a point in one second, scientists use a specific unit. What is the correct unit of frequency?  
a. Meter      b. Second      c. Hertz      d. Meter per second
  
11. A student wants to calculate how fast a wave is moving by using information about how often the wave repeats and how long each wave is. Which formula is used to calculate wave speed?  
a.  $v = \lambda \div T$       b.  $v = T \div \lambda$       c.  $v = f \div \lambda$       d.  $v = f\lambda$

12. A wave is observed to have a frequency of 4 Hz and a wavelength of 2 meters. Using the correct wave speed formula, what is the speed of this wave?

a. 4 m/s      b. 6 m/s      c. 8 m/s      d. 10 m/s

13. In an experiment using a slinky, the coils move back and forth in the same direction that the wave travels. In this type of wave motion, how do the particles vibrate?

a. Perpendicular to the wave direction      b. In circular motion  
c. Parallel to the wave direction      d. Without vibrating

14. Sound waves moving through air create regions where particles are close together and regions where they are spread apart. Which type of wave uses compressions and rarefactions?

a. Transverse wave      b. Water wave      c. Light wave      d. Longitudinal wave

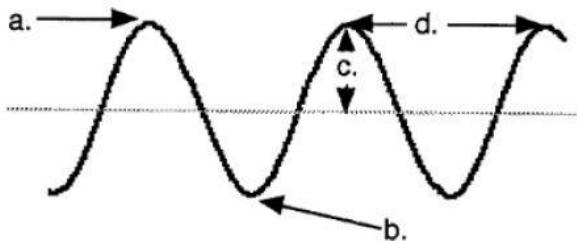
15. In a transverse wave, the wave moves forward through the medium while the particles move in a different direction. Which statement correctly describes the motion of particles in a transverse wave?

a. Particles move with the wave.  
b. Energy and matter move together.  
c. Particles vibrate parallel to the wave.  
d. Particles vibrate perpendicular to the wave.

**Label the parts of the wave shown in the diagram. Write the correct term on each line.**

The illustration to the right shows a wave.  
Label each part in the space below:

a. \_\_\_\_\_  
b. \_\_\_\_\_  
c. \_\_\_\_\_  
d. \_\_\_\_\_



The following questions refer to the diagram to the right:

(a) Is this wave transverse or longitudinal?  
(b) Letter H represents a \_\_\_\_\_ and  
letter I represents a \_\_\_\_\_.  
(c) Letter G represents a \_\_\_\_\_.

