

## Waves

Read from **Lesson 1** of the **Waves** chapter at **The Physics Classroom**:

<http://www.physicsclassroom.com/Class/waves/u10l1a.html>

<http://www.physicsclassroom.com/Class/waves/u10l1b.html>

<http://www.physicsclassroom.com/Class/waves/u10l1c.html>

**MOP Connection:** Waves: sublevel 1

**TRUE or FALSE:** Identify the following statements as being either true (T) or false (F).

**T or F?**

- \_\_\_\_\_ 1. Waves are created by a vibration.
- \_\_\_\_\_ 2. As a wave moves through a medium, the individual particles of the medium move from the source of the wave to another location some distance away.
- \_\_\_\_\_ 3. Waves are a means of transporting energy from one location to another without actually displacing matter from one location to another.
- \_\_\_\_\_ 4. An ocean wave will transport ocean water from near the middle of the ocean to a location near the shore.
- \_\_\_\_\_ 5. As mechanical waves move through a medium, particles of the medium undergo a periodic and repeated vibration about a fixed position.
6. Describe how a wave is different than a pulse.
7. Mechanical waves propagate or move through a medium because \_\_\_\_\_.  
a. the particles of the medium are able to move along the curved wavelike pathway  
b. one particle pushes or pulls on the adjacent particle which pushes or pulls on the next particle which ...  
c. the initial vibration of the medium causes the medium to assume the wavelike shape and this shape subsequently moves from one location to another.
8. Which of the following categories of waves require a medium in order to transport energy from one location to another?  
a. mechanical  
b. electromagnetic

## Wave Basics

### 9. What's Wrong With This?

Suppose you're watching a science fiction movie and one of the scenes involves a spaceship battle in outer space. Spaceship A launches a successful strike on spaceship B. The scene is presented from the perspective of spaceship A. The occupants of spaceship A view spaceship B blowing up as the result of the successful missile strike. They see the flames of the explosion and shortly thereafter hear the thunderous sound of the explosion.

While the scene is definitely exciting, there is a significant fault with it in terms of the physics. What law of physics was violated in the filming of the scene? Explain.

### 10. The arrows on the diagrams below represent the direction of particle motion.



Diagram A shows a \_\_\_\_ pulse and diagram B shows a \_\_\_\_ pulse.

a. longitudinal, transverse

b. transverse, longitudinal

### 11. Compare the direction in which particles of the medium vibrate for a longitudinal wave compared to a transverse wave. Reference the diagram in question #10 in your discussion.