

PHYS 1200 Physics of Everyday Experience

Review questions and exercises for Lecture 21 (V&W-2)

1. What is a mechanical wave?
2. Why are waves important?
3. What is the difference between a transverse and a longitudinal wave? Give an example of each.
4. What properties of the air changes when a sound wave propagates through it?
5. A large explosion occurs 5 miles from your location. When will you hear it?

Answers:

1. A mechanical wave is a disturbance that propagates through a medium.
2. Waves are important because they provide a mechanism for the transport of energy without the transport of matter.
3. In a transverse wave segments of the medium vibrate in a direction that is perpendicular to the direction of the wave. Example: a wave on a string. In a longitudinal wave segments of the medium vibrate back and forth along the same direction that the wave propagates. Example: a sound wave.
4. A sound wave causes changes in the pressure and density of the air.
5. The speed of sound is approximately 1/5 mile per sec. So it will take 25 s for the sound waves caused by the explosion to reach you.