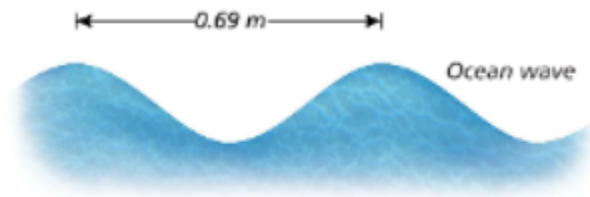


17.2 Properties of **Mechanical** Waves
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Directions: On a **Separate** Piece of Paper!!! Answer all open-ended questions in complete sentences. For math questions, show all of your work and include appropriate units and significant figures in your final answer to receive **FULL** credit.

1. Describe two ways you could measure the wavelength of a longitudinal wave.
2. If the wave period doubles, how does the wave's frequency change?
3. Describe an experiment to measure the frequency of a longitudinal wave in a spring.
4. If you double the frequency of a wave, what is the effect on its wavelength assuming speed does not change?
5. What causes refraction of a wave as it enters a new medium at an angle?
6. Regardless of the direction of waves far from an island, waves close to the island move toward the shore on all sides. Explain.
7. Two sound waves with different frequencies travel through a steel rod at the same speed. Explain by giving an operational definition of wave speed.
8. What is the wavelength of the ocean wave shown in the figure?



Math Practice:

1. What is the speed (v) of a wave that has a wavelength (λ) of 2.0 m and a frequency of 6.0 Hz?
2. Calculate the speed of a wave with a frequency of 2.0 Hz (2/s), amplitude of 3m, and a wavelength of 10.0 m.
3. If two wavelengths pass a given point each second, and the distance between wave crests is 3.0 m, what is the wave speed?
4. The lowest pitch that the average human can hear has a frequency of 20.0 Hz. If sound with this frequency has a wave speed of 340 m/s, what is its wavelength?
5. A bottlenose dolphin can hear sounds with frequencies up to 150,000 Hz. If the speed of sound in seawater is approximately 1,500 m/s, what is the wavelength?
6. Waves in the ocean are 6.0 m apart and pass a surfer every 2.0 s. What is the wave speed?

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7. A buoy on a lake bobs up and down. The waves that cross the buoy have a wavelength of 3.0 m and a frequency of 3.0 Hz. What is the speed of the waves?
8. A ship anchored at sea rocked by waves whose crests are 14.0 m apart. The waves travel at 7.0 m/s. How often do the wave crests reach the ship?
9. A deep water wave has a wavelength of 10.0 m. If it travels at 3.9 m/s, what is the wave's speed?
10. Why should a wave, such as a light wave, bend when it passes from air into water?
 - a. The wave does not actually bend, but only appears to bend.
 - b. The light wave interferes with other energy waves in the water.
 - c. Waves are usually reflected by water
 - d. The speed of light is slower in water.
11. Which of the following is an example of a mechanical wave?
 - a. A water wave
 - b. A gravitational wave
 - c. A light wave
 - d. An electromagnetic wave.



Examine the following waves to answer questions 11-13.



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12. Which wave has the highest energy? Why?

13. Which wave has the lowest energy? Why?

14. Calculate the frequencies of each wave given that each wave segment passed a given point in 2 seconds.