# W1 -Mechanical Waves

1. Two students, 5.0 m apart, each hold an end of a long spring. It takes 1.2 seconds for a pulse to travel from the student generating the pulse to the lab partner at the opposite end of the spring.

    a. How long will it take for the pulse to return to the "generator"?

    b. Explain the motion of the pulse passing through the spring.

    c. Calculate the speed of the pulse.

2. The "generator" in Problem 1 repeats the experiment with a pulse of twice the original amplitude. Will the pulse take more time, less time, or the same time to reach the far end of the spring? Explain your answer.

3. The students move so that they are now twice as far apart but use the same spring. How will the speed of the pulse sent now compare to the speed of the pulse sent when they were 5.0 m apart? Explain your answer.

4. The illustration below shows a series of transverse waves. Label each part in the space provided.

a. _____
b. _____
c. _____
d. _____
e. _____
f. _____
g. _____
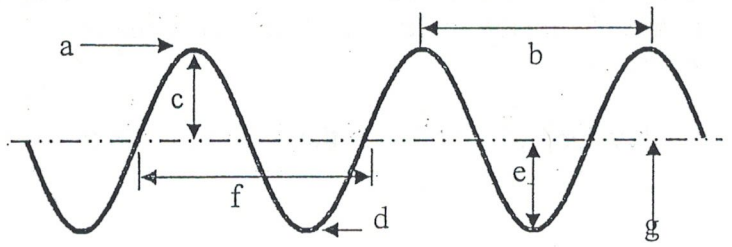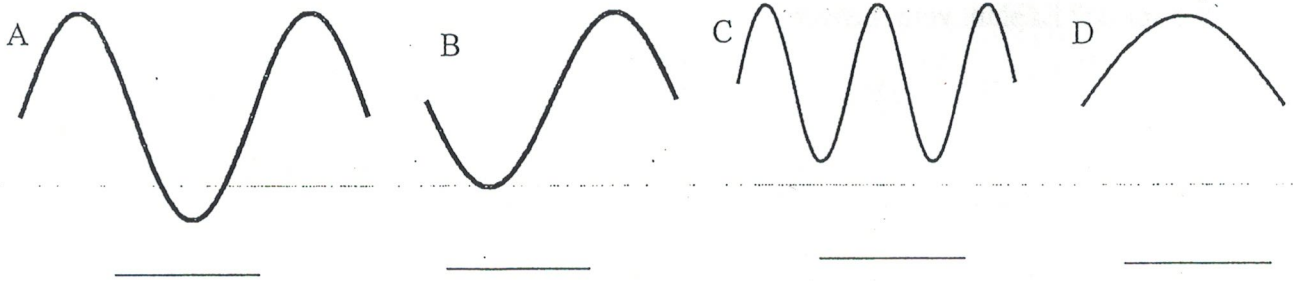

5. Waves carry _____ from one place to another.

6. The highest point on a transverse wave is the _____ while the lowest part is the _____.

7. The _____ is the height of the wave.

8. The distance from one crest to the next is the _____.

9. Below are a series of waves. Underneath each diagram write the numbers of waves in the series.

A _____   B _____   C _____   D _____

a. Which of the above has the biggest amplitude? _____
b. Which of the above has the shortest wavelength? _____
c. Which of the above has the longest wavelength? _____

10. Express in words and mathematically the relationship between
    a. period and frequency

    b. wavelength and frequency

    c. wavelength and period

11. Consider a wave generator that produces 10 oscillations per second. The speed of the waves is 300. cm/s.
    a. What is the period of the oscillation?

    b. What is the frequency of the oscillaton?

    c. What is the wavelength of the waves?

    d. What happens to the wavelength if the frequency of pulses is increased?

12.. A wave on Lake Galena passes by two docks that are 40.0 m apart.
    a. If there is a crest at each dock and another three crests between the two docks, determine the wavelength.

    b. If 10 waves pass one dock every 16.0 seconds, determine the period and frequency of the wave.

    c. What is the speed of the wave?

12. The wavelength of a sound wave in this room is 1.13 m and the frequency is 301 Hz.
    a. What is the speed of the wave in the room?

    b. If you double the frequency of the sound wave, determine its speed. How do you know?

    c. What happens to the wavelength if you cut the frequency in half? How do you know?