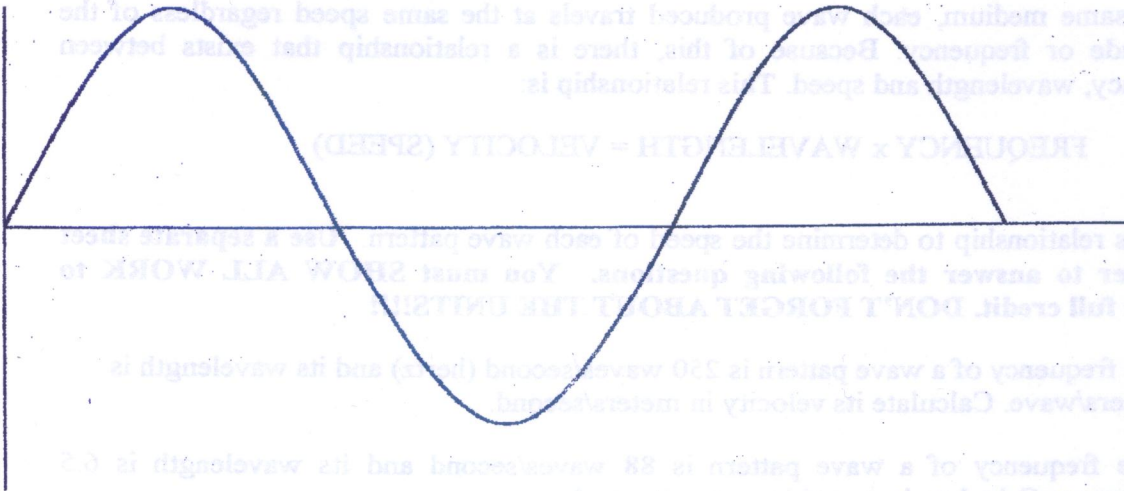


Are We On The Same Wavelength?

Part I. Anatomy of a wave

1. Label the parts of the wave, including: *trough*, *crest*, *wavelength*, and *wave height*



2. What happens to the wave when you decrease the wave height? Increase the wave height? Explain.

3. What happens to the wave when you decrease the wavelength? Increase the wavelength? Explain.

Part II. Calculating Wave Speed

Remember, in order to calculate the speed of any wave, you need to know two things: (1) the frequency or the number of waves passing one point per second and (2) the wavelength or the distance between the center point of one wave to the center point of the next wave.

In the same medium, each wave produced travels at the same speed regardless of the amplitude or frequency. Because of this, there is a relationship that exists between frequency, wavelength and speed. This relationship is:

$$\text{FREQUENCY} \times \text{WAVELENGTH} = \text{VELOCITY (SPEED)}$$

Use this relationship to determine the speed of each wave pattern. Use a separate sheet of paper to answer the following questions. You must **SHOW ALL WORK** to receive full credit. **DON'T FORGET ABOUT THE UNITS!!!!**

- (4) The frequency of a wave pattern is 250 waves/second (hertz) and its wavelength is 3.0 meters/wave. Calculate its velocity in meters/second.
- (5) The frequency of a wave pattern is 88 waves/second and its wavelength is 6.5 meters/wave. Calculate its speed in meters/second.
- (6) The frequency of a wave pattern is 110 hertz and its wavelength is 8.25 meters/wave. Calculate its velocity in meters/second.
- (7) If you know the velocity and frequency of a wave, how would you determine its wavelength?
- (8) Suppose a wave has a velocity of 125 meters/second and a frequency of 25 hertz, what is its wavelength?
- (9) If you know the velocity and wavelength of a wave, how would you determine its frequency?
- (10) Suppose the velocity of a wave is 88 meters/second and its wavelength is 12 meters/wave, what is its frequency?