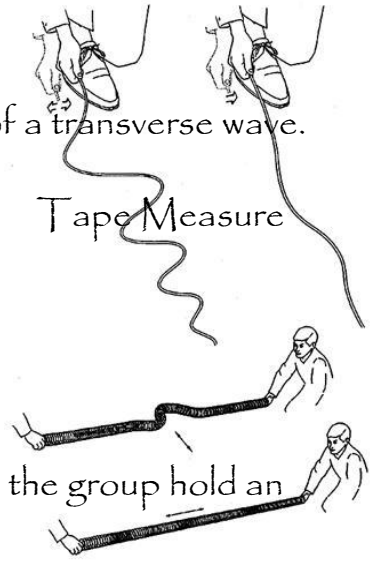
PS Physics Chapter 10 Name:_____

Transverse Wave Properties

Energy can move as waves through material such as ropes, springs, air, and water. Waves that need a material to pass through are called mechanical waves. A transverse wave is a mechanical wave that moves in right angles to direction the wave is moving. In this lab, you will be observing transverse wave and using your observations to make inferences out its properties.



Objective: To calculate the velocity, wavelength and frequency of a transverse wave.

Materials: Spring Stop Watch Graph Paper Tape Tape Measure

Procedure:

Part A: Velocity

1. Carefully lay the spring down on the floor. Have one person in the group hold an end and a second person stretch it out to about 3 to 5 meters.
2. Place a piece of tape somewhere along the straight line formed by the spring between you and your partner. This will mark the rest position (midline).
3. Measure the distance from one end of the spring to another. Distance =_____
4. Have one person hold an end still. Another person should gently move the spring end to end quickly to generate a wave. Repeat a few times to generate each wave with the same amount of energy.
5. Have another person record how long it takes for the wave to travel the length of the spring. Repeat for a total of 3 trials. Use the average time to calculate the velocity of the wave.

   Trial 1 Time=_____ Trial 2 Time = _____ Trial 3 Time=_____

   Average Time=_____

   Velocity (in m/s) = _____

Part B: Wavelength and Amplitude

1. As in part A, move the spring end to end quickly to generate a wave.
2. As the wave is moving through the spring, have one person place tape at every crest formed. You may need to repeat this a few times.
3. Measure the amplitude. **Amplitude = _____**
4. Measure the distance between crests to find wavelength. **Wavelength = _____**
5. Sketch the wave to scale and label the (wavelength, crest, amplitude) of the wave.

Part C: Frequency

1. Using the speed calculated from Part A and the wavelength measured from Part B to find the frequency of the wave. **Frequency = _____**

Part D:

1. Repeat Parts A-C for waves of different velocities. This can be done by moving the spring faster from side to side.
2. Repeat all steps to find velocity, wavelength, amplitude, and frequency.

Questions:

1. As you increased the motion of the spring, what happened to the frequency of the waves?

2. Did increasing the motion of the spring, have any effect on the wavelength? Explain.

3. Did increasing the motion of the spring, have any effect on the amplitude? Explain.