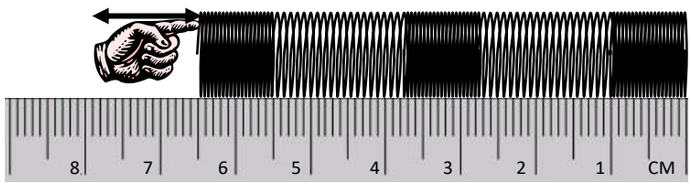
1. What is the difference between a transverse and a longitudinal traveling wave?

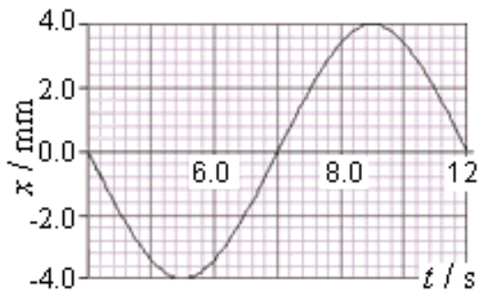
2. Explain what compressions and rarefactions are, and what type of traveling wave has these characteristics.

3. Explain what crests and troughs are, and what kind of traveling wave has these characteristics.

4. What kind of oscillation are the particles of a medium carrying a traveling wave undergoing?

Consider the wave train being transmitted through the spring as shown. The accompanying graph shoes the motion of a single loop of the spring as it moves back and forth in SHM.





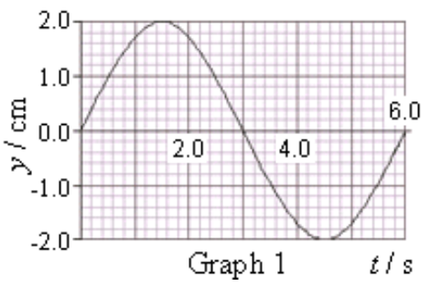
5. In the spring picture place a C at <u>each</u> *center* of a **compression**. In the picture place an R at <u>each</u> *center* of a rarefaction.

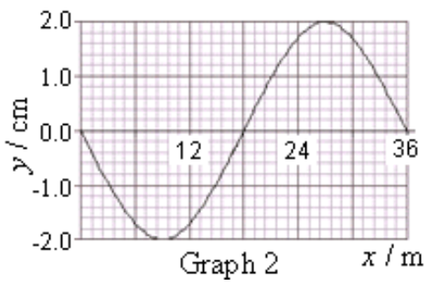
6. What is the frequency of the wave train?

7. What is the wavelength (in cm) of the wave train?

8. What is the wave speed (in cm s^{-1})?

A traveling wave has displacement y vs. time shown in Graph 1 and displacement y vs. horizontal position x in Graph 2.

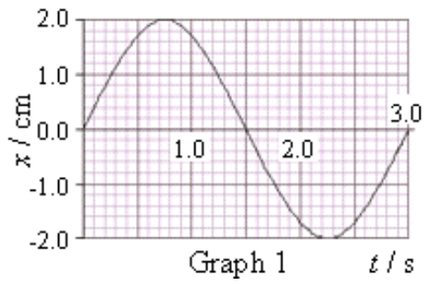


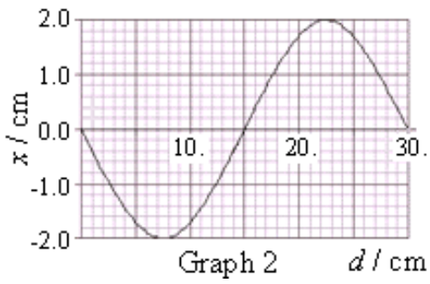


9. What are the amplitude and the period of the traveling wave?

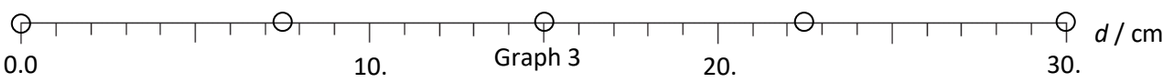
10. What are the wavelength and the wave speed of the traveling wave?

A longitudinal wave has displacement x vs. time shown for a single particle in Graph 1 and displacement x vs. horizontal position d for a particular instant in Graph 2. Graph 3 shows 5 particles in the longitudinal wave at their equilibrium position.





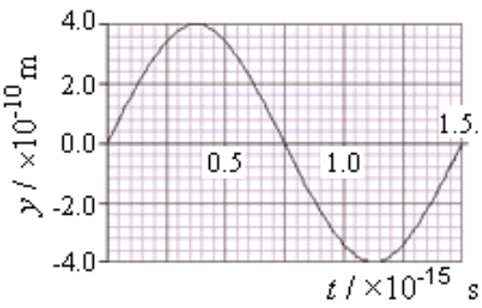
11. For <u>each</u> of the 5 particles, in Graph 3 (below) place an × reflecting the particles' positions at the instant depicted in Graph 2.



Graph 3

12. In Graph 3 place an R at the *center* of a rarefaction. Place a C at the *center* of a compression.

The displacement y vs. time t graph of a light wave is shown.



13. Find the frequency of the light. What portion of the electromagnetic spectrum does this place this light?

14. Find the wavelength of the light.

15. Explain why you don't need a displacement vs. distance graph for light, but you do for other traveling waves.

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16. A 350 watt speaker projects sound in a spherical wave. Find the intensity of the sound at a distance of 3.0 m and 9.0 m from the speaker.

At a distance of 45 m from a speaker the sound intensity is 5.0×10^{-1} W m^{-2}.

17. Find its intensity at a distance of 18 m.

18. Compare the amplitudes of the sound at 45 m and 18 m.