

1. Read Chapters 11,12,13.1&13.4,15.
2. **Terms to know:** mechanical wave, transverse wave, longitudinal wave, electromagnetic wave, pulse, medium, cycle, crest, trough, equilibrium position, traveling wave, period, frequency, wavelength, amplitude, phase, polarization, constructive interference, destructive interference, node, antinode, fundamental, harmonic, natural frequency, point source, wavefront, ray, plane waves, normal, angle of incidence, angle of reflection, pitch, volume (loudness), coherent, monochromatic, central maximum.
3. **Define:**
  - a) *standing wave*
  - b) *resonance*
  - c) *refraction*
  - d) *diffraction*
4. **State:** The Principle of Superposition
5. **State:** The Law of Reflection
6. What is the difference between a mechanical wave and an electromagnetic wave?
7. Compare the motion of the medium and the motion of the energy for a:
  - a) transverse wave
  - b) longitudinal wave
8. a) How can the speed of a wave in a slinky be changed?  
  
b) How can the frequency of a wave in a slinky be changed?
9. Give two terms used to describe a:
  - a) sound wave
  - b) light wave
10. What is the speed of sound:
  - a) at STP?
  - b) at room temperature?

11. How does the speed of sound change with:
  - a) density?
  - b) temperature?
12. What is the speed of light:
  - a) in a vacuum?
  - b) in air?
  - c) in other materials?
13. What is the speed of all types of electromagnetic radiation?
14. a) How is frequency calculated?  
  
b) How is period calculated?
15. Compare a sound wave with a radio wave.
  - a) Give two terms to describe each.
  - b) What is the speed of each?
16. a) Sketch two pulses that will interfere constructively.  
  
b) Sketch two pulses that will interfere destructively.
17. When a wave crosses a boundary from one medium to another (say, from air to water or from a thick spring to a light spring) what three characteristics of the wave remains the same?
18. As a light wave crosses from air into water, what happens to its:
  - a) frequency?
  - b) wavelength?
  - c) speed?
19. As a sound wave crosses from air into water, what happens to its:
  - a) frequency?
  - b) wavelength?
  - c) speed?

20. Sketch a picture of each of the following wave phenomena:
- a) reflection
  - b) refraction
  - c) diffraction
  - d) double slit interference
21. What feature of a wave is related to the energy of the wave if it is a:
- a) mechanical wave?
  - b) electromagnetic wave?
22. Sketch each of the following standing waves on a string and label its wavelength, nodes and antinodes:
- a) fundamental
  - b) second harmonic
  - c) third harmonic
23. a) The pitch of a musical note is related to its \_\_\_\_\_.
- b) The loudness (volume) of a musical note is related to its \_\_\_\_\_.
24. Sketch a pulse before and after a:
- a) hard reflection
  - b) soft reflection

25. What is the significance of Young's Double Slit experiment?
26. a) Describe the pattern that appears on a screen after light passes through two slits.
- b) What factors affect the spacing of the fringes in this pattern? How do they affect it?
27. Be able to calculate the locations of the bright fringes of an interference pattern. What formula is used?
28. For diffraction to be noticeable, what must be the relationship between the wavelength and the size of the opening?
29. Give some examples of resonance.
30. What types of waves can be polarized?
31. What types of waves cannot be polarized?

<b>Quantity</b>	<b>Symbol</b>	<b>Units</b>	<b>Scalar/Vector</b>
Amplitude			
Frequency			
Period			
Wavelength			
Speed			