Objectives for Physics II

Chapter 11 Part 2: Waves

1. Be able to describe what is meant by "period" and "frequency" for an oscillating system and to measure them.
2. Be able to distinguish between transverse and longitudinal waves according to how the medium oscillates when such waves travel through them.
3. Be able to identify what is transported by waves.
4. Be able to interpret displacement *vs* time plots (history plots) and displacement *vs* position plots (snapshot plots) for a medium in which a wave is traveling. Specifically, you should be able to find, when possible, the amplitude, the wavelength, and the period of a periodic wave as well as to describe what is represented each kind of plot.
5. Be able to use the wavelength of a periodic wave with its period to determine the velocity of the wave.
6. Be able to list the two factors that affect the speed of a wave on a string and to describe how changing them affects the wave speed.
7. Be able to define what is meant by the "intensity" of a wave, describe what the intensity of a wave depends on, and state the units of intensity.
8. Be able to describe how a pulse reflects both from "free" ends and "fixed" ends of a medium.
9. Be able to determine the superposition of two pulses whose positions and amplitudes are given in a plot of amplitude *vs* position.
10. Given the round trip time for a pulse in a specific medium with two "fixed" ends, be able to determine the fundamental period at which this medium resonates.
11. Be able to describe how forced oscillations can at times cause a system to resonate.
12. Be able to describe what a standing wave is and how one can create a standing wave.
13. Be able to sketch the standing wave diagrams of the fundamental and the harmonics of a specific medium that has two fixed ends.
14. Be able to calculate the frequencies of the harmonics of a system with two fixed ends from the known fundamental.
15. Be able to describe in words and with a sketch what refraction is and to describe how it occurs.
16. Be able to describe in words and with a sketch what interference is and to describe how it occurs.
17. Be able to describe in words and with a sketch what diffraction is and to describe how it occurs.
18. Be able to describe systems you have experienced for which waves are a good model.