Chapters 25: **Waves**

Text:
Chapter 25
Think and Explain: 1-10
Think and Solve: 1-4

Vocabulary:
wave, pulse, oscillation, amplitude, wavelength, wave speed, frequency, period, interference, constructive, destructive, node, anti-node, reflection, focal point, soft reflection, angle of incidence, hard reflection, crest, trough, compression, longitudinal, transverse, diffraction, standing wave, Doppler effect/shift, bow/shock waves, sonic boom

Equations:

$$f = \frac{1}{T} \qquad v = \lambda f$$

Key Objectives:
Concepts
- ❑ identify, define, use and/or explain the vocabulary above. (This is HUGE.)
- ❑ compare and contrast longitudinal waves and transverse waves, with examples.
- ❑ explain how wave speed, amplitude, wavelength and frequency relate to each other and be able to state how the change in one variable effects the others.
- ❑ given two waves, draw how the waves will interfere with each other
- ❑ compare and contrast the two ways that waves reflect off a variety of surfaces and boundaries.
- ❑ explain how to change the speed of a wave traveling in a particular medium.
- ❑ explain, draw, identify how plane and circular waves reflect or pass by barriers. (i.e. Ripple Tank Lab.)
- ❑ identify where nodes and anti-nodes would exist, for both strings and circular waves.
- ❑ given a picture of a wave, be able to identify and measure the waves amplitude and wavelength, and the crest and trough of the wave.
- ❑ compare and contrast "wave motion" with "particle motion," e.g. how would you decide if something is a wave or a particle, what can a wave do that particles not do, etc.
- ❑ explain the Doppler effect, sonic booms and shock waves.
- ❑ for standing waves in a string, determine the wavelengths of the fundamental frequency and also of the harmonics

Problem Solving
- ❑ convert between frequency and period.
- ❑ convert between rpm and Hz.
- ❑ determine a wavelength based on a string length and the number of nodes/anti-nodes.
- ❑ calculate the missing variable in problems with wavespeed, wavelength and frequency.
- ❑ calculate speed, time or lengths with sound pulses in tubes (i.e. Reflections in a Tube lab)