Name: _____Class Hour:_____

Book O Chapter 1 The Energy of Waves

Section One p. 2 – 9

1. ___Wave_____: a disturbance in a solid, liquid, or gas as energy is transmitted through a medium

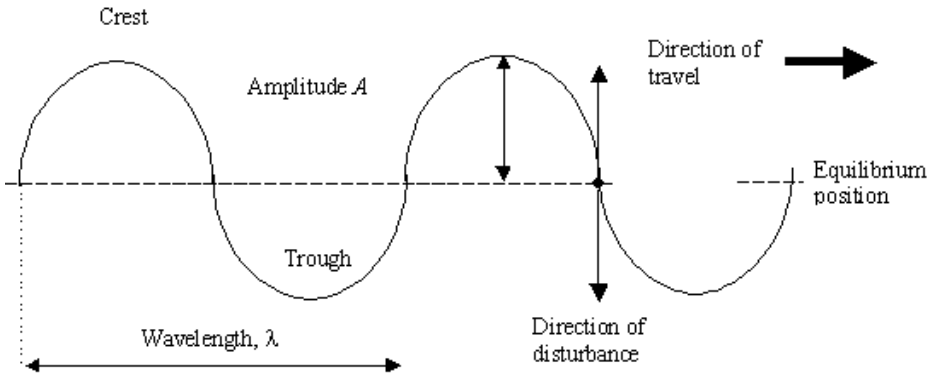
   **the material through which the wave travels does NOT move with the energy

2. ___Medium_____: the substance through which a wave can travel, the physical environment in which phenomena can occur

** waves that need a medium are called *mechanical waves* = *sound waves*

**waves that do NOT need a medium are called *electromagnetic waves* = light waves, x-rays, microwaves, TV and radio signals

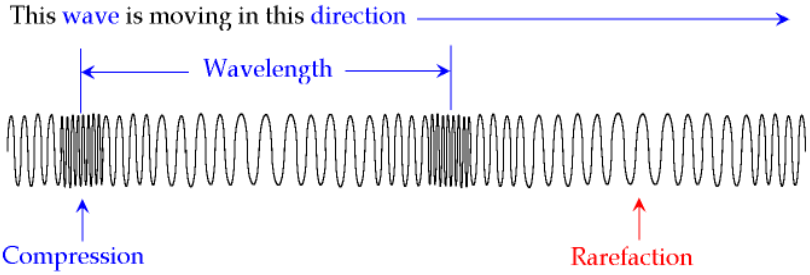
3. __Transverse wave_____: the particles of the medium move perpendicularly to the direction the wave is traveling



4. ____Crest____: the highest point of a wave

5. ____Trough____: the lowest point of the wave

6. __Longitudinal wave_____: a wave in which the particles of the medium vibrate parallel to the direction of the wave motion
====== like a slinky



7. ___Compression____: the part of a longitudinal wave where the particles are close together

8. _Rarefaction____: the part of a longitudinal wave where the particles are far apart

9. _____Surface wave___: ocean waves are an example of surface waves; they are near the boundary between two media and are a transverse wave combined with a longitudinal wave. The particles move in circles rather than up and down! *(page 9)

Section 2 pages 10 – 13

10. __Amplitude_____: the maximum distance that the particles of a wave's medium vibrate from their rest position
**large amplitude = more energy in the wave

11. _____Wavelength _: the distance from any point on a wave to an identical point on the next wave, crest to crest or trough to trough
** shorter wavelength = more energy in the wave λ

12.____Frequency ____: the number of waves produced in a given amount of time, expressed in hertz (Hz)
** higher frequency = more energy in the wave

13. ___Wave speed_____: the speed at which a wave travels through a medium
13. (continued) ** wave equation tells you the relationship between wavelength and frequency, and calculates wave speed $v = \lambda \times f$
V = wave speed λ = wavelength f = frequency

Section 3 pages 14 – 19

14. ___Reflection___: the bouncing back of a ray of light, sound, or heat when the ray hits a surface that it does not penetrate
**an echo is a reflected sound wave

15. _____Transmitting_____: to allow waves to pass through a substance or medium * (page 14)

16. _____Refraction_____: the bending of a wave as the wave passes from one medium to another at an angle, the wave speed changes when waves are refracted

16. ___Dispersed_____: when light is dispersed it is spread out into separate colors *(page 15)

18. ____Diffraction_____: a change in the direction of a wave when the wave finds an obstacle or an edge, such as an opening
** look at the example on p. 16

19. _____Interference____: the combination of two or more waves that results in a single wave
constructive interference – when the crest and trough of one wave overlaps another wave = larger amplitude and more energy than the original wave

destructive interference – 2 waves with the same amplitude combine and cancel each other out, = no wave at all

20. ___Standing wave_____: a standing wave looks like it is not moving, but waves are actually going in both directions

21. _____Resonance_____: when 2 objects vibrate at the same frequency, the sound made by one object makes the other object vibrate also = resonates