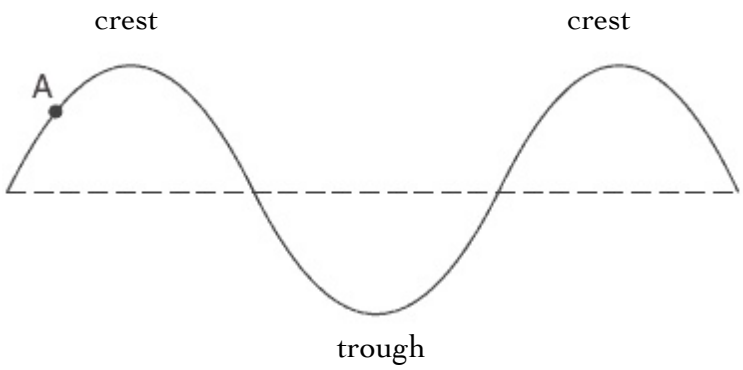
Periodic Motion

"The period that David reigned over Israel was forty years; seven years he reigned in Hebron, and in Jersualem he reigned thirty-three years." 1Kings2:11

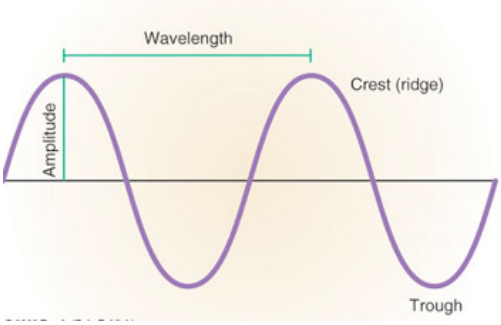
- waves: periodic back-and-forth motion that transmits energy
- medium – substance through which a wave transfers its energy

Transverse waves

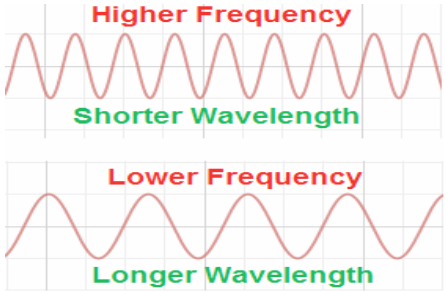
- waves in which particles of the transmitting medium move back and forth at right angles to the direction in which the waves are traveling; oscillating side to side in relation to direction of wave travel (ex. Waves traveling along rope, floating objects)
- direction of wave movement ---------->
- crests – high points of waves; troughs – low points



- wavelength l (λ lambda): distance from once crest to another/one trough to the next OR compression-compression/rarefaction-rarefaction
- amplitude: wave height; directly related to energy of wave b/c more energy=higher amplitude



- frequency: number of complete waves (crest + trough) that pass a given point in a second; frequency is measured in hertz (Hz) which is "per second" as in waves per second (waves/sec) or cycles/sec
- speed: rate at which a wave travels through a medium; speed of wave will not change as long as the medium does not change; when waves move faster 1)speed is greater 2)greater #waves will pass a given point per sec 3)increase in frequency



speed = wavelength x frequency

Let's practice!

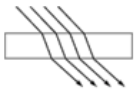
You are surfing in Hawaii and the last thing on your mind is physics. The wavelength of your wave is 10meters and its frequency is 5Hz. What is your speed?

speed = wavelength x frequency
= 10m x 5 Hz = 50 m/s
(Notice that the units of speed are the same as before!)

If there's still time, we'll study...

- reflection: change in the course of a wave as a result of a collision with an object or boundary; incident – waves that strike obstacle, reflected – waves that bounce off object
- law of reflection: the angle of incidence = angle of reflection

- refraction: if medium is altered the speed of waves may be altered; wave speed may change resulting in change in direction toward the slower medium; bending of a wave path as a result of a change in wave speed [p. 331]



- diffraction: spreading out of a wave after it passes through a narrow opening