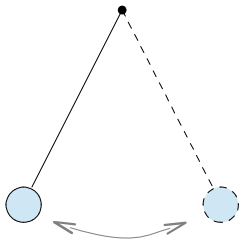
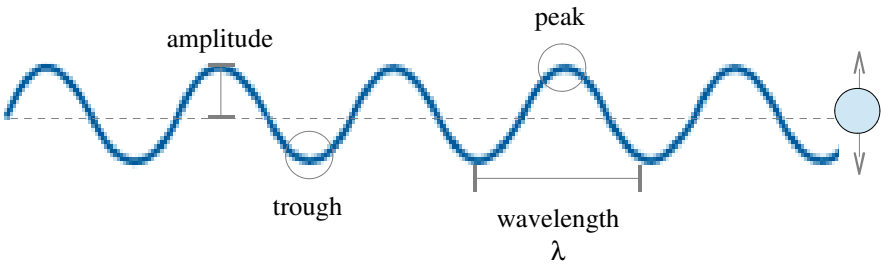
Waves



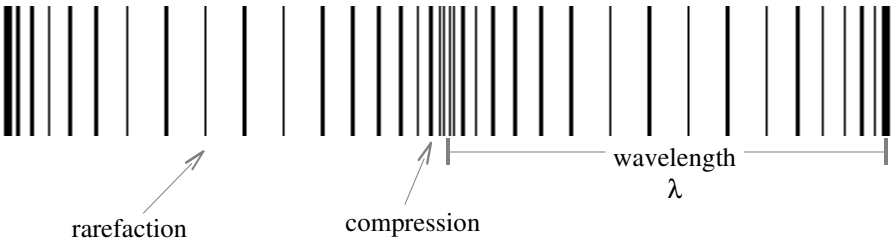
The *time* it takes a pendulum to go back and forth once is called its period.

If the pendulum is moved across as it moves back and forth, it traces out a wave:



The above wave is transverse, meaning the direction of *oscillation* (vibration) is at right angles to the direction of *propagation* (wave travel).

If the oscillation is along the same direction as the propagation of the wave, it is longitudinal:



Waves are produced by vibrations. For example radio waves are produced by oscillating electrons, and sound waves by an oscillating speaker.

The faster the object producing the waves is oscillating, the more frequently it produces *cycles* of the wave. This defines the frequency. The higher the frequency, the lower the period.

$$f = \frac{1}{T}$$

frequency in Hz (hertz) or s^{-1} (cycles per second)

one

period in s (seconds)

The speed a wave travels depends only on the *medium* (the substance it is travelling through).

$$v = \lambda f$$

speed in ms^{-1} (metres per second)

frequency in Hz or s^{-1}

wavelength in m (metres)