Summary of Physics Stuff to Know For 2nd Semester

Energy:

$E_{el}=1/2\ kx^2$ $E_g=mg\Delta y$ $E_k=1/2\ mv^2$ $E_{th} = F_f\Delta x$

Impulse/Momentum:

P=momentum p=mv $\Delta p=m\Delta v$

Δp=impulse=$F\Delta t$ (or impulse = area under F vs t graph)

Oscillating particle:

F=kx (Hooke's law); k is spring constant

T not proportional to A

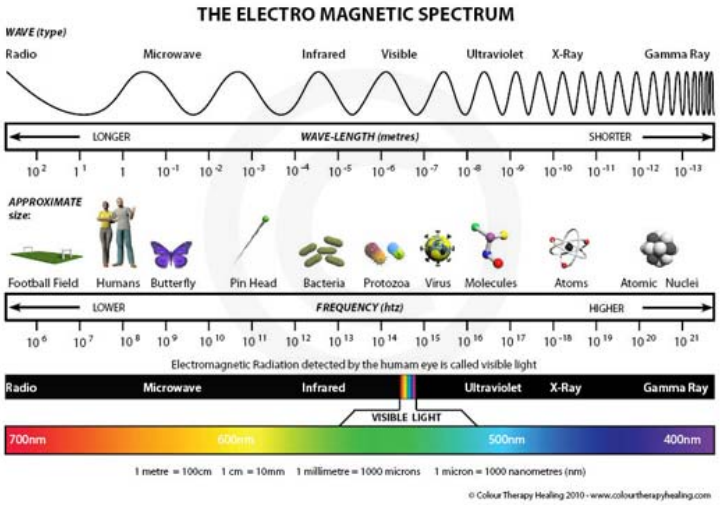
$T \propto \sqrt{m}$

$T \propto \sqrt{1/k}$

T=1/f f = 1/T

f = cycles/sec or f=waves/sec. or f=oscillations/sec

T=seconds/oscillation



Waves/Sound/Light:

V=fλ

$c=3x10^8$

In the diagrams below, the top image shows the fundamental frequency (or in other words 1st harmonic, or mode #1). The 2nd image would be the 2nd harmonic (mode #2) which is the first overtone, and so on….

Two open (free) ends:

$L = 1/2\ \lambda$

f

$L = 2/2\ \lambda$

$2f$

$L = 3/2\ \lambda$

$3f$

$L = 4/2\ \lambda$

$4f$

$L = 5/2\ \lambda$

$5f$

One open (free), one closed (fixed):

$L = 1/4\ \lambda$

f

$L = 3/4\ \lambda$

$3f$

$L = 5/4\ \lambda$

$5f$

Two closed (fixed)

$L = 1/2\ \lambda$

f

$L = 2/2\ \lambda$

$2f$

$L = 3/2\ \lambda$

$3f$

$L = 4/2\ \lambda$

$4f$

$L = 5/2\ \lambda$

$5f$