ANSWER KEY Practice problems:

1. Growing up in the Washington D.C. area, my favorite radio station was D.C. 101 which broadcasts on a frequency of 101.1 MHz. (hint M = mega = 1 x 10^6)
   a. Find the wavelength
   $\lambda = (3 \times 10^8 \text{ m/s}) / (101.1 \times 10^6 \text{ Hz})$
   $= 2.97 \text{ m}$

   b. Find the energy
   $E = h \nu$
   $= (6.63 \times 10^{-34} \text{ J*sec}) (101.1 \times 10^6 \text{ Hz})$
   $= 670.293 \times 10^{-28} \text{ J or } 6.703 \times 10^{-28} \text{ J}$

2. Find the wavelength and energy of your favorite radio station.
3. What is the energy of light with a frequency of 4.31×10^{14} Hz?
   $E = h \nu$
   $= (6.63 \times 10^{-34} \text{ J*sec}) (4.31 \times 10^{14} \text{ Hz})$
   $= 28.5753 \times 10^{-20} \text{ J or } 2.858 \times 10^{-21} \text{ J}$

4. A certain violet light has a wavelength of 413 nm. What is the frequency of the light? (hint nano = nm = 1 x 10^{-9} meters)

   $\nu = c / \lambda$
   $= (3.00 \times 10^8 \text{ m/sec})/(4.13 \times 10^{-7} \text{ m})$
   $= 7.26 \times 10^{14} \text{ sec}^{-1} \text{ or Hz}$

5. A certain green light has a frequency of 6.26×10^{14} Hz. What is the wavelength?
   $\lambda = c / \nu$
   $= (3.00 \times 10^8 \text{ m/s})/(6.26 \times 10^{14} \text{ Hz})$
   $= 4.79 \times 10^{-5} \text{ m}$

6. What is the energy of light with a wavelength of 662 nm?
   $E = hc / \lambda$
   $E = [(6.63 \times 10^{-34} \text{ J*sec})(3 \times 10^8 \text{ m/s})]/(6.62 \times 10^{-7} \text{ m})$
   $= 3.00 \times 10^{-19} \text{ Joules}$