

Remember: **ANSWERS**

ν = frequency = f

in hertz (Hz) or sec^{-1} or 1/s;

λ = wavelength; meters or cm or μm

E = energy; joules or J

c = speed of light

h = plank's constant

$$c = f \lambda \quad \text{or} \quad c = \nu \lambda \quad ; \quad c = 3.0 \times 10^8 \text{ m/s}$$

$$E = h f \quad \text{or} \quad E = h \nu \quad ; \quad h = 6.63 \times 10^{-34} \text{ J's}$$

AM radio is in kHz (830AM; frequency is 830×10^3 1/s)

FM radio is in MHz (101.3FM; frequency is 101.3×10^6 1/s)

A nano meter (nm) is 1×10^{-9} meter

- 1) What is the wavelength of a yellow sodium emission line that has a frequency of 5.08×10^{14} Hz?
 $5.9 \times 10^{-7} \text{ m}$
- 2) What is the wavelength of a cell phone that transmits at a frequency of 1.243×10^9 Hz? 0.241 m $2.41 \times 10^{-1} \text{ m}$
- 3) What is the wavelength of KDWB radio that transmits at a frequency of 101.3 on the FM dial? $2.96 \times 10^0 \text{ m}$ or 2.96 meters
- 4) What is the frequency of violet Hg emission line that has a wavelength of 4.03×10^{-7} meters? (what is its wavelength in nanometers?) $7.44 \times 10^{14} \text{ Hz}$ 403 nanometers ($403 \times 10^{-9} \text{ m}$)
- 5) What "color" would you call a wave that has a frequency of 8.69×10^{17} Hz? ; what is its wavelength?
 $3.45 \times 10^{-10} \text{ m}$ "ultra violet"
- 6) What is the frequency of a "yellow" emission line?
Yellow is about 580 nm or $580 \times 10^{-9} \text{ m}$; $\nu = 5.17 \times 10^{14} \text{ Hz}$