

Sample Problem

What is the wavelength (nm) of visible green light with frequency 6.0×10^{14} Hz?

$$c = \lambda \times \nu$$

$$\lambda = \frac{c}{\nu}$$

$$\lambda = \frac{3.00 \times 10^8 \text{ m/s}}{6.0 \times 10^{14} \text{ 1/s}}$$

$$\lambda = 5.0 \times 10^{-7} \text{ m}$$

...but $1 \text{ nm} = 1 \times 10^{-9} \text{ m}$ so...

$$\lambda = 5.0 \times 10^2 \text{ nm} \quad (\sim 500 \text{ nm})$$



Sample Problem

What is the wavelength (nm) of the electromagnetic radiation coming from the KSTP 94.5 FM radio station?

$$\nu = 94.5 \text{ MHz} = 94.5 \times 10^6 \text{ Hz}$$

$$c = \lambda \times \nu$$

$$\lambda = \frac{c}{\nu}$$

$$\lambda = \frac{3.00 \times 10^8 \text{ m/s}}{94.5 \times 10^6 \text{ 1/s}}$$

$$\lambda = 3.17 \text{ m}$$

...but 1 nm = 1×10^{-9} m so...

$$\lambda = 3.17 \times 10^9 \text{ nm} \quad (317,000,000 \text{ nm}) \text{💡}$$