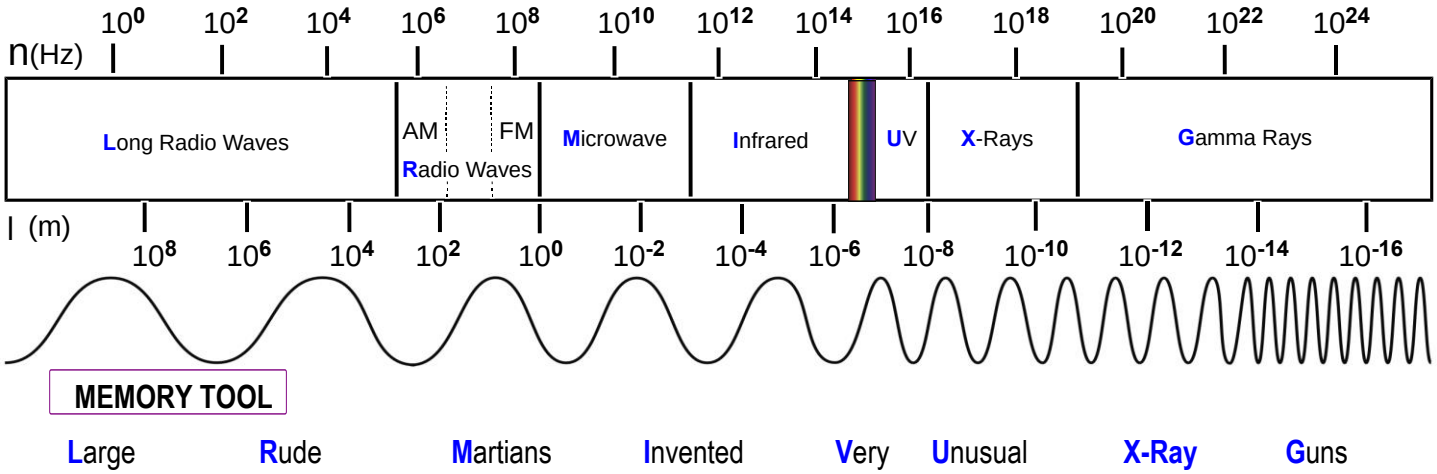
CONCEPT: ELECTROMAGNETIC SPECTRUM

● **The Electromagnetic Spectrum** is a continuum of *electromagnetic radiation* containing all wavelengths and frequencies.

□ As we move from radio waves to gamma rays, the wavelengths _____ and frequencies _____.



MEMORY TOOL

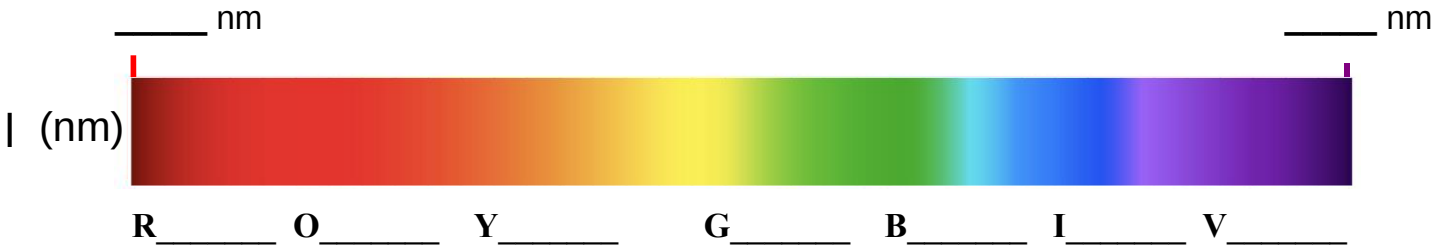
Large **R**ude **M**artians **I**nvented **V**ery **U**nusual **X-Ray** **G**uns

EXAMPLE: Which kind of electromagnetic radiation contains the greatest amount of energy per atom?

a) Microwave b) X-Ray c) Radio Waves d) Ultraviolet e) Infrared

Visible Light Spectrum

● Represents the small portion of the continuum that we can see without the aid of instruments.



PRACTICE: Which of the following sources of electromagnetic radiation will have the highest frequency?

a) Visible Light (λ = 595 nm)

b) Visible Light ($\Delta E = 4.39 \times 10^{-19}$ J)

c) Visible Light (λ = 690 nm)

d) Visible Light ($\nu = 4.11 \times 10^{15}\ s^{-1}$)

CONCEPT: ELECTROMAGNETIC SPECTRUM

PRACTICE: A carbon–oxygen double bond within a sugar molecule absorbs electromagnetic radiation at a frequency of $6.0 \times 10^{12}\ s^{-1}$. What portion of the electromagnetic spectrum does this represent?

a) Radio Waves b) Microwave c) Infrared d) Green Light e) Gamma Ray

PRACTICE: X-Ray detectors are devices that use scintillators to convert X-rays into light in order to detect X-Rays indirectly. Which of the following would be picked up by an X-Ray detector: radiation with a wavelength of 0.85 nm or a frequency of $6.52 \times 10^{11}\ s^{-1}$?