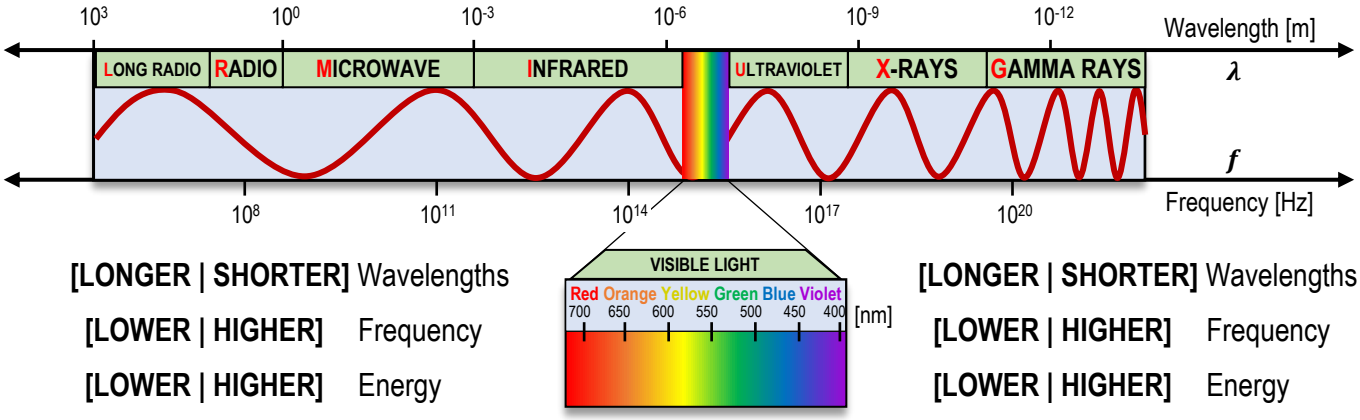
CONCEPT: THE ELECTROMAGNETIC SPECTRUM

● The Electromagnetic Spectrum is a _____ of EM waves (a.k.a light) of *ALL* wavelengths/frequencies.

- Based on their properties, scientists have labeled certain portions or "bands" of the spectrum.

MEMORY TOOL

"Large Rude Martians Invented Very Unusual X-Ray Gadgets"



[LONGER | SHORTER] Wavelengths
[LOWER | HIGHER] Frequency
[LOWER | HIGHER] Energy

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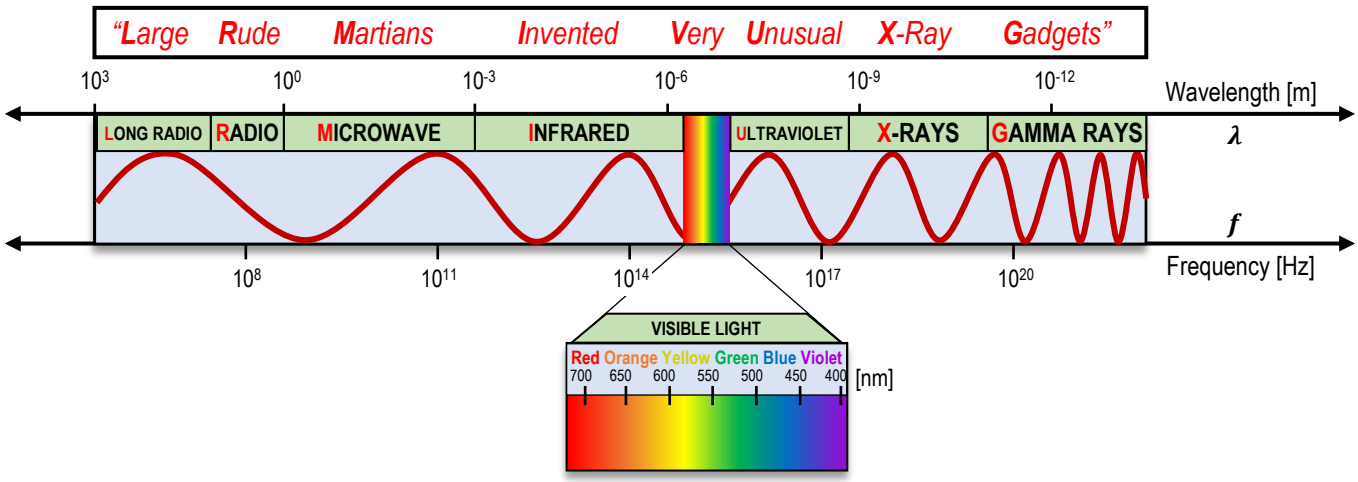
● Remember: *ALL* waves obey $v = \lambda f$. Because light is a wave and *always* moves at the same speed (c), $c =$ _____

EXAMPLE: Human beings continuously emit electromagnetic waves with wavelengths of approximately 9 micrometers.
a) Calculate the frequency of these electromagnetic waves.
b) Which band of the Electromagnetic Spectrum do these waves belong to?

$c = 3 \times 10^8 \frac{m}{s}$



PROBLEM: A standard cell phone transmits electromagnetic waves with a frequency of 1.90×10^{9} Hz. Calculate the wavelength of these electromagnetic waves.

E.M. WAVES EQUATIONS
$E = cB$
$c = \lambda f$
CONSTANTS
$c = 3.0\times10^{8}\ \frac{m}{s}$