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Unit 2, Section 2 - Light Energy - Electromagnetic Radiation

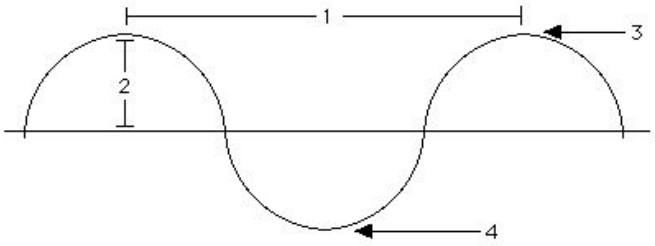
As a form of energy, light (electromagnetic radiation) travels in _____ through the environment. Below are the parts of a wave:

1 - _____

2 - _____

3 - _____

4 - _____



Energy of a wave can be identified in two easy ways: wavelength and frequency of the wave. Wavelength is a measurement of the distance from _____ to _____ on two consecutive waves and is often measured in meters or nanometers. Frequency refers to the number of waves that pass a point per _____, measured in Hertz (Hz).

Let's practice some metric conversions!

Multiplication Factor	Prefix	Symbol
$1,000,000,000 = 10^{9}$	giga	G
$1,000,000 = 10^{6}$	mega	M
$1,000 = 10^{3}$	kilo	k
$100 = 10^{2}$	hecto	h
$1 = 1$		
$0.01 = 10^{-2}$	centi	c
$0.001 = 10^{-3}$	milli	m
$0.000001 = 10^{-6}$	micro	µ
$0.000000001 = 10^{-9}$	nano	n

- Convert from 34 cm to meters:

34 centimeters (cm)	0.01 meters (m)
	1 centimeters (cm)

- Convert from 1,340 km to millimeters:

- Convert from 1.23×10^{14} nanometers (nm) to meters:

- Convert from 2.3 Megahertz (MHz) to Hertz (Hz):

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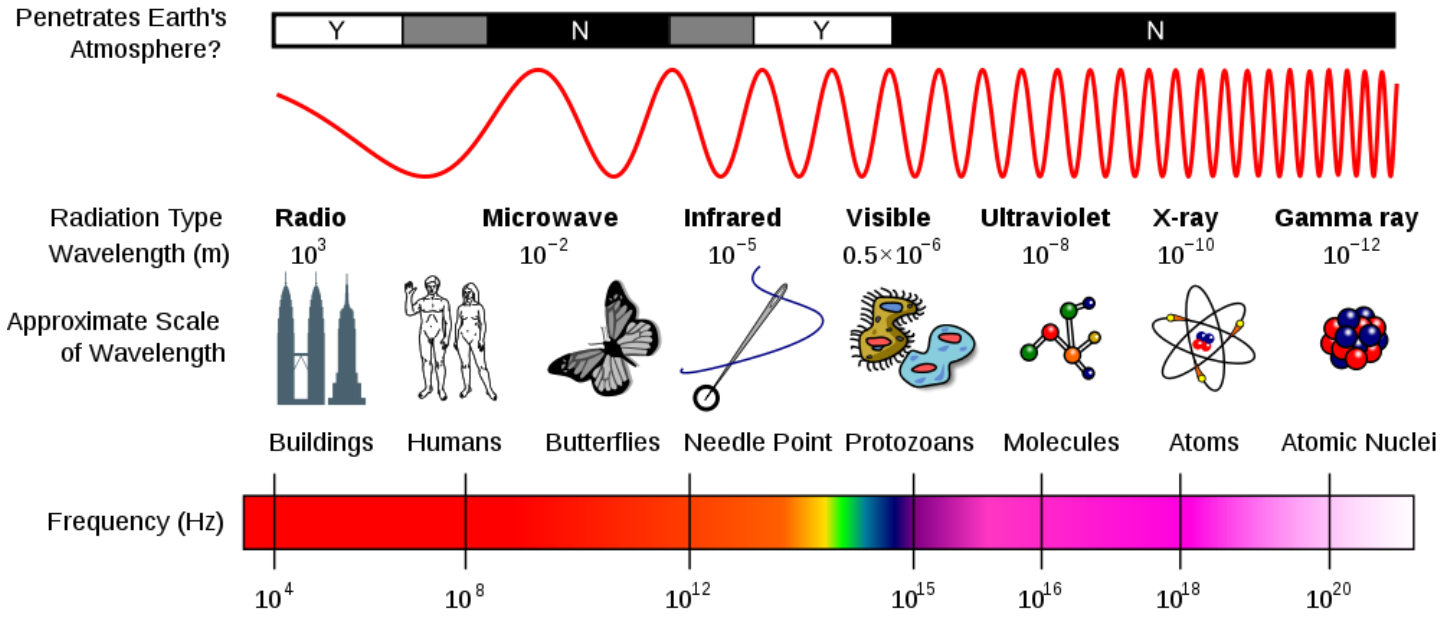
Electromagnetic Spectrum:

The electromagnetic spectrum is the full spectrum of all light energy. The spectrum is designed based on decreasing _____ and increasing _____. The shorter the wavelength, the _____ the energy of the wave.



Circle the correct answer for the statements/questions below:

1. The waves to the RIGHT on the spectrum are at a (**higher energy** / **lower energy**) than the waves to the left.

2. Which of the following energies has the LONGER wavelength? **Radio** or **Infrared**

3. Which of the following energies has the SHORTER wavelength? **X-Ray** or **Microwave**

Match the following wavelengths/frequencies of light with their correct type of radiation:

1. Wavelength of 1.0×10^{-5} meters (m) = _____
2. Wavelength of 9.43×10^{-10} meters (m) = _____
3. Frequency of 1.22×10^{5} meters (m) = _____
4. Frequency of 5.4×10^{15} meters (m) = _____

Now, let's put it all together. Convert the following, then identify the correct type of radiation:

1. 49 nanometers (nm) = _____ meters (m) - _____

2. 0.0032 nanometers (nm) = _____ meters (m) - _____