



Wavelengths

1. Gamma Rays




Gamma Rays



$$\frac{\text{wave speed}}{\text{frequency}} = \text{wavelength}$$
$$\frac{300,000,000 \text{ m/s}}{4 \times 10^{19} \text{ hertz}} = \boxed{7.5 \times 10^{-12}} \text{ m}$$

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2. X-Rays




X-Rays



$$\frac{\text{wave speed}}{\text{frequency}} = \text{wavelength}$$
$$\frac{300,000,000 \text{ m/s}}{3 \times 10^{18} \text{ hertz}} = \boxed{1 \times 10^{-10}} \text{ m}$$

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3. Ultraviolet Radiation




Ultraviolet Radiation



$$\frac{\text{wave speed}}{\text{frequency}} = \text{wavelength}$$
$$\frac{300,000,000 \text{ m/s}}{6 \times 10^{15} \text{ hertz}} = \boxed{5 \times 10^{-8}} \text{ m}$$

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4. Visible Light




Visible Light



$$\frac{\text{wave speed}}{\text{frequency}} = \text{wavelength}$$
$$\frac{300,000,000 \text{ m/s}}{5 \times 10^{14} \text{ hertz}} = \boxed{6 \times 10^{-7}} \text{ m}$$

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5. Infrared Radiation




Infrared Radiation



$$\frac{\text{wave speed}}{\text{frequency}} = \text{wavelength}$$
$$\frac{300,000,000 \text{ m/s}}{7 \times 10^{13} \text{ hertz}} = \boxed{4.3 \times 10^{-6}} \text{ m}$$

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6. Microwaves




Microwaves



$$\frac{\text{wave speed}}{\text{frequency}} = \text{wavelength}$$
$$\frac{300,000,000 \text{ m/s}}{5 \times 10^9 \text{ hertz}} = \boxed{6 \times 10^{-2}} \text{ m}$$

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7. Radio Waves



Radio Waves



$\frac{\text{wave speed}}{\text{frequency}} = \text{wavelength}$

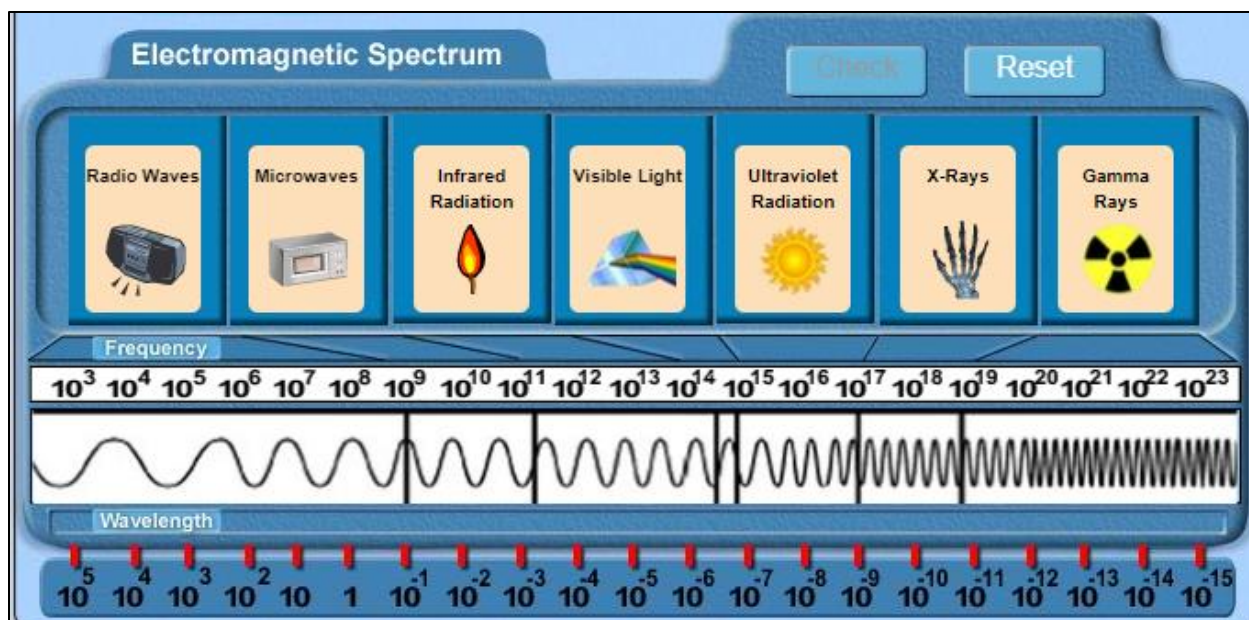
$\frac{300,000,000 \text{ m/s}}{1 \times 10^7 \text{ hertz}} =$

 m

Find Wavelength

Electromagnetic Spectrum

Frequency(hertz)	Wavelength(meters)	Type of Wave
1×10^{-7}	30	Radio Waves
5×10^9	6×10^{-2}	Microwaves
7×10^{13}	4.3×10^{-6}	Infrared Radiation
5×10^{14}	6×10^{-7}	Visible Light
6×10^{15}	5×10^{-8}	Ultraviolet Radiation
3×10^{18}	1×10^{-10}	X-Rays
4×10^{19}	7.5×10^{-12}	Gamma Rays



Journal

1. As you move from left to right on the electromagnetic spectrum, what happens to frequency? What happens to wavelength?

The frequency increases and the wavelength decreases.

2. Arrange the following types of electromagnetic waves in order by wavelength, from longest to shortest:

1. Radio waves
2. Microwaves
3. Infrared Radiation
4. Visible Light
5. Ultraviolet Radiation
6. X-Rays
7. Gamma Rays

3. What kinds of EM waves have the lowest frequencies? What kinds have the highest frequencies?

Radio waves, microwaves, and infrared waves have the lowest frequencies. Gamma rays, X-rays, and ultraviolet waves have the highest frequencies.

4. Which type of EM wave has more energy, an ultraviolet wave or an infrared wave? How can you tell this by looking at the electromagnetic spectrum?

An ultraviolet wave has more energy due to its higher frequency than the infrared wave.

5. In terms of wavelength and frequency, what is the difference between a radio wave and an X-ray?

A radio wave has longer wavelengths, but shorter frequencies. While an x-ray has higher frequencies, and shorter wavelengths.

6. Based on your results, which type of EM wave do you think is more dangerous, a low-frequency wave or a high-frequency wave? Why?

Based on the results, a high-frequency wave is way more susceptible to danger than a low-frequency one because of the energy it emits. It is known that gamma rays or x-rays are bad for body cells, as they can kill these cells.