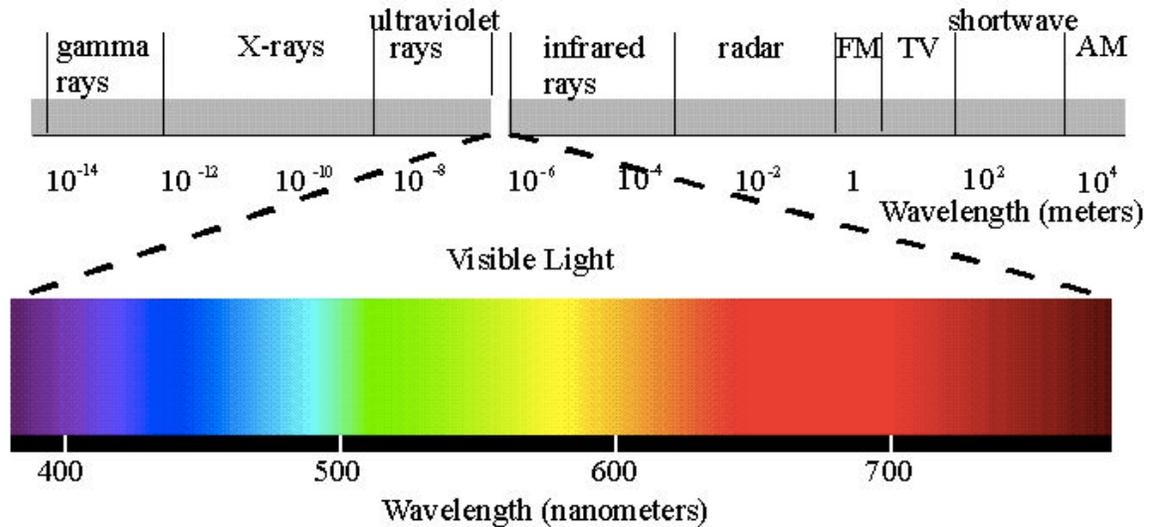


Standard: 6.2 - Describe the electromagnetic spectrum in terms of frequency and wavelength and identify the locations of radio waves, microwaves, infrared radiation, visible light (red, orange, yellow, green, blue, indigo, and violet), ultraviolet rays, x-rays, and gamma rays on the spectrum.



Sunscreen protects skin by absorbing harmful ultraviolet radiation from the Sun.

- Ultraviolet radiation has which of the following properties?
 - a shorter wavelength than x-rays
 - a lower frequency than radio waves
 - a higher frequency than visible light
 - a longer wavelength than microwaves

- Grains and spices are irradiated with gamma rays to kill most of the bacteria or fungi that are normally present. Although microwaves are another form of radiation, the properties of these waves do not make them as useful as gamma rays for sterilizing food. In which of the following ways do gamma rays differ from microwaves?
 - Gamma rays have a lower frequency and longer wavelength than microwaves.
 - Gamma rays have a lower frequency and shorter wavelength than microwaves.
 - Gamma rays have a higher frequency and longer wavelength than microwaves.
 - Gamma rays have a higher frequency and shorter wavelength than microwaves.

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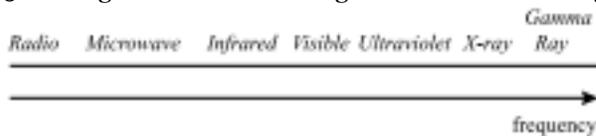
3. Electromagnetic waves with low frequencies have been used for long-distance underwater communication. These waves **most likely** belong to which of the following parts of the electromagnetic spectrum?

- A. gamma rays
- B. infrared waves
- C. radio waves
- D. x-rays

4. Ultraviolet and x-ray radiation can damage human cells. Which of the following is a property of these two forms of radiation?

- A. low wave speed
- B. short wavelength
- C. low wave frequency
- D. small wave amplitude

5. The figure below shows regions of the electromagnetic spectrum.



Which of the following devices is designed to produce electromagnetic radiation with the **longest** wavelength in order to operate?

- A. light bulb
- B. microwave oven
- C. x-ray microscope
- D. FM radio transmitter

6. Which of the following properties determines a color in the visible light region of the electromagnetic spectrum?

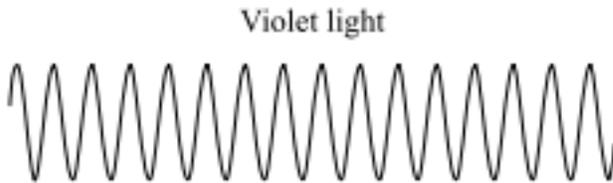
- A. acceleration
- B. amplitude
- C. frequency
- D. speed

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7. When some elements are put into a flame, they emit colored light. Yellow light is emitted from one element and violet light is emitted from another element.

- a. Describe the differences between yellow light and violet light in terms of frequency **and** wavelength.

The diagram below represents violet light.



- b. Copy the diagram of violet light into your Student Answer Booklet. Below your diagram, draw and label a representation of yellow light that illustrates how its frequency and wavelength are different from that of violet light.
- c. Yellow light and violet light are both in the visible range of the electromagnetic spectrum. Identify **two** other similarities between yellow light and violet light.

8. Which of the following statements **best** describes the visible spectrum of light as seen by the human eye?

- A. The lowest frequency appears red, and the highest frequency appears violet.
- B. The lowest frequency appears red, and the highest frequency appears yellow.
- C. The lowest frequency appears green, and the highest frequency appears violet.
- D. The lowest frequency appears green, and the highest frequency appears yellow.

9. Radio waves, visible light, and x-rays are examples of electromagnetic waves that **always** differ from each other in

- A. amplitude.
- B. intensity.
- C. temperature.
- D. wavelength.