

TEACHING TRANSPARENCY WORKSHEET

15

The Electromagnetic Spectrum

Use with Chapter 5,
Section 5.1

1. What kinds of waves have the longest wavelength? What kinds of waves have the shortest wavelength?

Radio waves are the longest waves. Gamma rays are the shortest waves.

2. Which waves have the lowest frequency?

Radio waves

3. Which has a higher frequency: microwaves or X rays?

X rays

4. Which waves can be seen by the eye?

Visible light spectrum

5. Sequence the different segments of the visible spectrum in order from shortest wavelength to longest wavelength.

Violet, Blue, green, yellow, orange, Red

6. Sequence the following types of waves from lowest frequency to highest frequency: ultraviolet rays, infrared rays, gamma rays, radio waves, and green light.

Radio waves, Infrared, green light, ultraviolet, gamma rays

7. Compare the wavelengths and frequencies of each kind of wave. What is the relationship between frequency and wavelength?

Frequency & wavelength are inversely proportional.
As Freq ↑ wavelength ↓

8. What is the wavelength of a radio station emitting its signal at 95.5 MHz? Estimate your answer to the nearest power of ten.

Given:

$$c = 3.00 \times 10^8 \text{ m/s}$$

$$\lambda = ?$$

$$v = 95.5 \text{ MHz}$$

Soln:

$$\left(\frac{95.5 \text{ MHz}}{1} \right) \left(\frac{1 \times 10^6 \text{ Hz}}{1 \text{ MHz}} \right) = 9.55 \times 10^7 \text{ Hz}$$

$$c = \lambda v$$

$$\lambda = \frac{c}{v} = \frac{3.00 \times 10^8 \text{ m/s}}{9.55 \times 10^7 \text{ Hz}}$$

$$\lambda = 3.14 \text{ m}$$