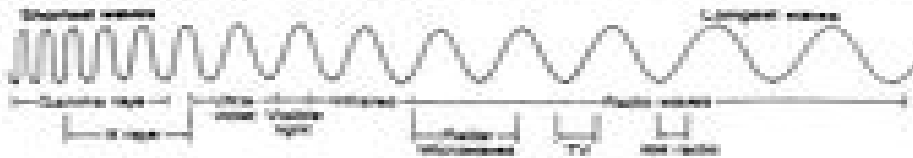


**Respecting the Spectrum**

The chart below shows the electromagnetic spectrum. Study the diagram of the spectrum. Then answer the questions that follow.



1. Are X rays longer or shorter than radio waves? Shorter
2. Are all gamma rays shorter than X rays? Explain your answer. Yes, gamma rays are shorter than X-rays and therefore have more energy.
3. Which are longer—AM radio waves or TV waves? Both radio.
4. Can you see radio waves? How does their position on the electromagnetic spectrum determine this? No, they are longer than the visible range.
5. How does the wavelength of waves used in microwave ovens compare with the wavelength of waves used for radio? They are longer.
6. Which color of visible light has the longest wavelength? The shortest? Red is longest. Violet is shortest.
7. Use a dictionary to look up the meaning of the prefix infra-. What does this tell you about the position of infrared radiation on a diagram of the electromagnetic spectrum? Infra means below and infrared is just longer than visible and ultraviolet is even longer than that.
8. What is the dictionary definition of the prefix ultra-? How does this relate to the location of ultraviolet wavelengths on the electromagnetic spectrum? Ultra means over or above so ultra violet is just shorter than visible light and it is higher energy than that.
9. Ultraviolet rays cause sunburn, and X rays can penetrate deep inside our bodies. Gamma rays kill cancer cells. What does this show about how living material is affected by the shortest wavelengths in the electromagnetic spectrum? The shorter the wavelength the more damage the energy is doing.