

Week 27 - Light

Read Pages 339-342 – Electromagnetic Spectrum

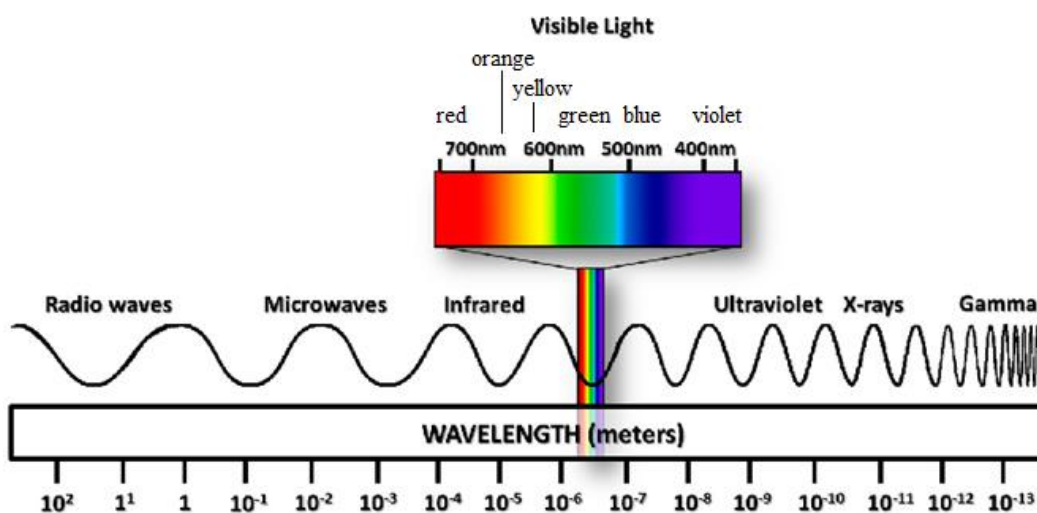
TQ1. What are two ways that an electromagnetic (EM) wave is different from a mechanical wave?

TQ2. What is the speed of an electromagnetic wave in a vacuum? What is the symbol for this speed?

TQ3. At higher frequencies, do EM waves have longer or shorter wavelengths?

TQ4. If an EM wave travels into a new medium and its speed decreases, what happens to the frequency? What happens to the wavelength?

TQ5. If an EM wave has a very big wavelength, what can be said about its frequency – large or small? What can be said about its energy – large or small?



CQ6. What color of light has a wavelength of approximately 450 nm?

CQ7. What color of light has a wavelength of approximately 700 nm?

CQ8. Which radiation has the greatest frequency?

CQ9. Which radiation has the largest wavelength?

CQ10. Why will ultraviolet (UV) radiation give you cancer but violet light will not?

QQ11. If a wave of light has a frequency of 1.5×10^{13} Hz, what is the wavelength in meters? What type of radiation is it?

QQ12. If a wave has a frequency of 7.5×10^{18} Hz, what is the wavelength in meters? What type of radiation is it?

QQ13. Using the EM Spectrum above, what is the approximate wavelength of yellow light? Calculate the approximate frequency of yellow light ($1 \text{ nm} = 1 \times 10^{-9} \text{ m}$)