Warm-UP:

A Constant Light

Light is a form of radiation that surrounds us almost all the time. Electromagnetic radiation takes on the form of radio waves, microwaves, infrared light, visible light, ultraviolet light, X rays, and gamma rays. All of these forms of energy have one thing in common: When traveling through a vacuum, they all move at the same speed, which is the speed of light. That speed is 300,000,000 meters per second, or 3.0×10^8 m/s.

Velocity of light is constant and equals the frequency of the wave times the wavelength. If blue light has a shorter wavelength than red light, how do the frequencies of the two compare?

Wavelength ↓ = ↑ Frequency = ↑ Energy

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- Description of Light: Form of energy that can act as a wave and as a particle

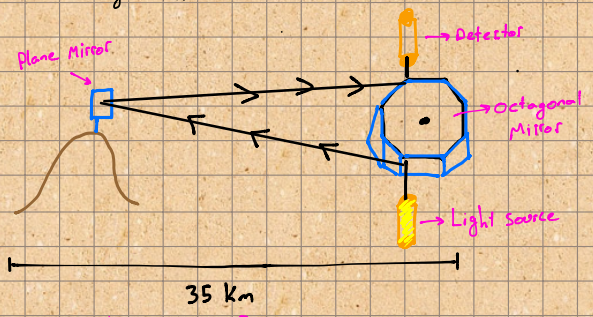
→ Ancient Greeks thought that light consisted of tiny particles that enter the eye to create vision

→ Others thought that vision resulted from streams of light emitted by the eye and reflected back

→ Newtonian times → light travels in waves

→ 1905: Einstein published the photoelectric effect
↳ proved wave-particle duality

→ Light was originally thought to have infinite speed
↳ Albert Michaelson [1880] measured speed by directing light with an octagonal mirror



Speed of light = $3.0 \cdot 10^8$ m/s

↳ Travel around the earth 7.5 times in one second
↳ 40,075,000 m = earth circumference