Name Key Hour _____

LIGHT Notes

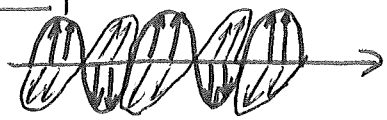
We **see an object** in 2 ways:

1. The object is the source of light

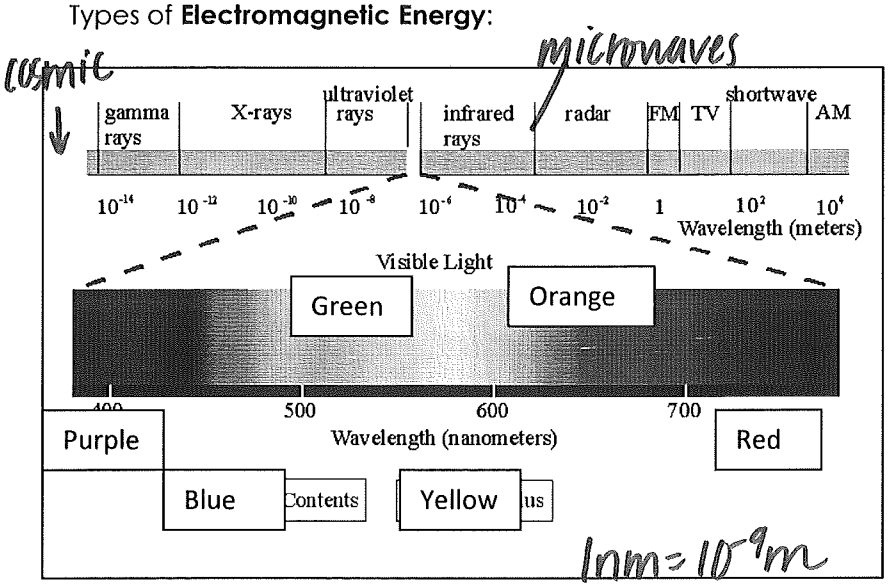
Ex: light bulb, flame, star

2. By light reflected from an object which enters our eyes and allows us to see object

Light: Energy in the form of electric and magnetic fields- called **electromagnetic radiation**. Acts like both a particle and a **transverse wave** as it travels.



Types of **Electromagnetic Energy**:



Electromagnetic Spectrum:

TV, Radio: long λ, low *f*

Infrared: Heat

Ultraviolet: UV rays emitted
Sun, tanning booths
Birds, bees may see them

X-rays: Fires e- at Tungsten which releases x-rays

Gamma rays: high energy found in stars, cancer treat.

Cosmic rays: highest energy
Solar flares, supernovas

Light:

Visible light is **electromagnetic radiation** with a λ of 4×10^{-7} m to 7.5×10^{-7} m 400-700nm

*Travels in straight lines called light rays

*Does NOT need a medium to travel through (why light travels in space)

*Behaves like both a particle and a wave

- massless
- photon emitted
- no medium
- affected by gravity
- can interfere
- crest/trough
- transfers energy
- has f + λ

The speed of light (c) is 3×10^{8} m/s

Speed of light (c) = freq x wavelength

$c = f\lambda$

If the wavelength of light increases, what will happen to the frequency of the wave?

$3 \times 10^{8} = f\lambda$ λ↑, f↓ (inverse)

Which color (purple or red) has a greater frequency? (more waves/sec) Explain your answer.

red has longer λ → lower f

purple ↓λ → ↑freq