Light Study Guide:

**Electromagnetic spectrum:**

EM waves are transverse waves.
Radio waves, microwaves, infrared waves, visible light (ROYGBIV), Ultraviolet, x-ray, gamma
Long wavelength Short wavelength
Low frequency High frequency
Low energy High energy

ROYGBIV—frequency and energy increase from red all the way to violet.
 -- Wavelength decreases from red all the way to violet.
 -- All color waves travel at the speed of light (3.0x108m/s)

Understand what each type of wave would be used for.
Speed of electromagnetic waves – CONSTANT – all EM waves travel at 3.0x108m/s.
Light emission- electron transfer

**Color**
Primary colors of light- blue, green, red
Primary pigments- magenta, yellow, cyan
Additive and subtractive properties of light
 Red + Blue = Magenta
 Blue + Green = Cyan
 Green + Red = Yellow

 Red + Blue + Green = White
 White – Red – Blue – Green = Black

Whatever an objects reflects is what you see. It absorbs all other colors. My green shirt reflects green and absorbs red and blue (magenta).

**Polarization**Use of filters to only allow waves in that travel in the same direction.
Example: polarized sunglasses See notes on blog labeled polarization.

**Refraction and Snell’s Law
n1sinθ1 = n2sinθ2**

As light travels from one medium into another, we can calculate the angle at which light bends (refracts).
Each medium has an index of refraction (n).

Light travels slower in mediums with larger index of refraction.

See notes on blog for practice examples using Snell’s Law.

**n=c/v**
n is index of refraction
c is speed of light in a vacuum
v is velocity of light ray in said medium

Lenses:

Be able to use formulas for lenses:



Be able to identify images that come from convex and concave lenses based on where the object is placed.

