Unit 12 Traditional – Vocabulary and Equations – Light, Reflection & Color

Vocabulary:

previous vocabulary
light, photon, opaque, transparent (translucent)
electromagnetic radiation (AKA: EM or EMR)
electromagnetic spectrum
scattering, Rayleigh scattering
Radiation: Radio waves, Microwaves, Infrared, Visible light, Ultraviolet light, X-rays, Gamma rays
primary additive colors, primary subtractive colors
stained glass, color filter
complementary color
rod, cone, retina, iris, optic nerve, lens, Pupil
color constancy, color deficiency, after-image
pigments (paints), matte surface, glossy surface
diffuse reflection, specular reflection
fluorescence, phosphorescence, luminescence
polarized light, LCD, lux, lumen
mechanical wave, electromagnetic wave

Symbols:

R, G, B, C, Y, M, f, T, v, λ

Equations & constants:

$V_{light} = c = 3 \times 10^8$ m/s

Lens/mirror: $1/d_o + 1/d_i = 1/f$

Magnification: $M = -d_i / d_o$ $M = h_i / h_o$

$f = 1/T$, $v = f\lambda$ $d = v\,t$

$$I = \frac{P}{A} = \frac{P}{4\pi r^2}$$

Adding lights:

R+B = M, R+G = Y, B+G = C, R+G+B = White

Subtracting paints/pigments:

C+Y = G, C+M = B, Y+M = R, C+Y+M = Black

Polarized lenses: 50% of un-polarized light is blocked by one lens; 100% blocked by cross-polarized lenses

Unit Objectives - Williams

1. Color(spotlights and color vision, stained glass filters, opaque objects, and paints)
2. Law of Reflection
3. Properties of images for convex, concave, or flat mirrors (virtual/real, large/small, up/inverted)
4. Law of Reflection and Ray tracing for concave, convex, and flat mirrors to determine image size, type, and location
5. Mirror equation
6. Magnification equation
7. Polarized lenses

DuPage ROE Objectives

801. I can distinguish between transverse or longitudinal waves.
802. I can identify waves as either mechanical or electromagnetic.
803. I can identify: wavelength, amplitude, crest, trough, and period, given a visual representation.