

04 Objectives, equations and vocabulary-Light & Color

$f = 1/T = \text{cyc/sec}$ $v = f\lambda$ $x = vt$ $2^{(1/12)} = 1.05946$ $A_0 = 27.5 \text{ Hz}$	$M = V_0/v_{\text{sound}}$ $v_{\text{sound}} = 331 + 0.6T(^{\circ}\text{C})$ $v_{\text{sound}} \sim 340 \text{ m/s}$ $e = 1.60 \times 10^{-19} \text{ C}$ $k = 9.0 \times 10^9 \text{ Nm}^2/\text{C}^2$ $Q = ne$	$V = W/q = J/C$ $i = \Delta Q/\Delta t$ $\Delta V = iR$ $P = E/t$ $P = iV$ $P = V^2/R$	$I \Delta$ inversely with r^2 $\Delta: +10 \text{ dB} = 2x \text{ Vol} = 10x I$ $\text{Beats} = f_1 - f_2 $ $\text{Series } R_e = R_1 + R_2$ $\text{Parallel } 1/R_e = 1/R_1 + 1/R_2$ $N_1/V_1 = N_2/V_2$	$F = k \frac{q_1q_2}{r^2}$ $E = \frac{F}{q} = \frac{kq}{r^2}$
---	---	---	---	--

Light & Color

1. The student understands all vocabulary, math, demos, videos, class assignments and discussions
2. The student remembers objectives & vocabulary from previous units.
3. The student can compare and contrast important features of light and sound
4. The students understands what EMR is, the EMR spectrum, and knows the seven classes of EMR in order including their relative wavelengths and frequencies (memorization)
5. LS: The understands how EMR relates radiation concerns, global warming, microwave ovens, remote controls, medical diagnostics (x-rays) and worries about cancer development
6. The student understands the 3 ways light can interact with matter
7. The student understands color constancy, how humans see colors, the brain's role in color vision, after images, color deficiency (color blindness), and distinguishing individual points of light (pointillism)
8. The student knows RGB & CYM systems, color addition/subtraction for each with equal intensities
9. The student knows why sunsets are red and the sky is blue
10. The student understand how light intensity varies with distance
11. The student understands and can solve light problems using the wave speed equation
12. The student knows the common metric prefixes used in class (memorization)
13. The student understands the basics of incandescence, fluorescence, phosphorescence and luminescence, examples of each and can apply these and other features in picking out light bulbs
14. The student fundamentally knows light polarization & how it's used in LCD TV's and smart phones

Numbered Unit Vocabulary list (you need to know all previous vocabulary too)

<ol style="list-style-type: none"> 1. c 2. EMR 3. Electromagnetic Spectrum 4. Radio waves 5. Microwaves 6. Infrared 7. Visible light 8. Ultraviolet, UV 9. X-rays 10. Gamma rays 11. Global warming 12. Greenhouse gas 13. Retina 	<ol style="list-style-type: none"> 14. Rods 15. Cones 16. R,G,B 17. Photon 18. After images 19. Color constancy 20. Pointillism 21. Color mixing 22. Additive color mixing 23. Subtractive color mixing 24. C, Y, M 25. Paints, pigments 26. Opaque 	<ol style="list-style-type: none"> 27. Translucent 28. Color filter 29. Scattering 30. Tera 31. Giga 32. Mega 33. Kilo 34. Centi 35. Milli 36. Micro 37. Nano 38. Incandescence 39. Luminescence 	<ol style="list-style-type: none"> 40. Fluorescence 41. Phosphorescence 42. CFL 43. LED 44. K 45. Polarized light 46. Polarizing filter 47. Horizontally polarized light 48. Vertically polarized light 49. LCD
--	--	---	---