

LIGHT STUDY GUIDE

Name _____

Period _____

Chapter 20-21: Light & Color

1. List the 7 categories of electromagnetic waves in order from lowest frequency to highest frequency. For each type of wave, give an example of how it might be used and describe the relationship among the different waves. e.g. frequency, wavelength and photon energy.
2. What is the source of an electromagnetic wave? Is it a transverse or longitudinal wave?
3. What is the speed of light and is it always constant?
4. List the order of colors in the color spectrum.
5. State which colors have the longest and which have the shortest wavelength.
6. Name the additive primary colors of light.
7. Specify the result when given primary colors of light combine additively.
8. Define complementary colors and give examples.
9. Differentiate between white light and black.
10. Name the subtractive primary colors of paints.
11. Calculate the wavelength of the FM radio station at 101.9 MHz.
12. Calculate the frequency of blue light. (wavelength of blue is 465 nm)

Chapter 22-23: Mirrors & Lenses

13. Explain the law of reflection. Diagram and label a reflected ray.
14. Define refraction.

15. Illustrate and explain the effects of refraction of light waves by drawing a ray as it enters a piece of crown glass at a 40° angle.
16. What is the index of refraction of a material? How is Snell's law related to the index of refraction?
17. Explain and illustrate how mirages are formed.
18. Explain how a prism separates white light into colors.
19. Define lens and mirror.
20. Distinguish between converging and diverging lenses.
21. Aidan is looking through a converging lens at a bug, which is 75.0 cm away from the lens. Aidan's lens has a focal length of 20.0 cm. Aidan adjusts the lens so he can see a focused image of the bug.
 - a. How far from the lens is the image of the bug?
 - b. Draw a ray diagram showing the image.
 - c. Calculate the magnification of the image of the bug.
 - d. Is the image upright or inverted?
22. Explain how convex and concave lenses form images.
23. List some examples of lens in optical instruments.
24. Explain how the human eye forms images.
25. Explain the causes of nearsightedness and farsightedness and accommodations for each.