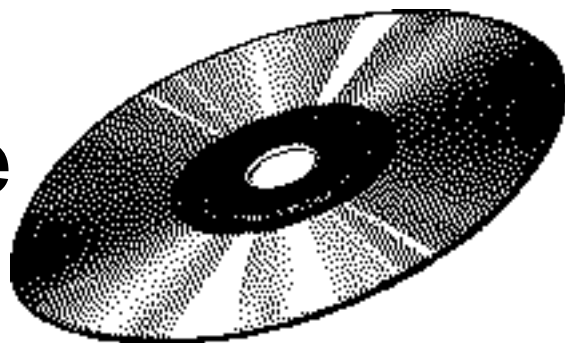


Light Study Guide



OBJECTIVES

By the end of this unit you should be able to:

1. Calculate the frequency, wavelength, or velocity of light in a medium, knowing two of the three quantities.
2. Measure and compare the angle of incidence and angle of reflection of light.
3. Apply the relationship between angle of incidence and angle of reflection to predicting the location of images formed by a reflecting surface.
4. Find the relationship between total length, image and object size, and image and object distance using a curved mirror.
5. Make measurements of the angle of incidence and the angle of refraction to calculate the index of refraction of a material medium.
6. Determine the path taken by a ray of light, given the direction of the incident ray, the orientation of the refracting interface, and the index of refraction of the refraction medium.
7. Determine the focal length of a mirror experimentally.
8. Given the location of an object with respect to converging and diverging lens locate the image by means of constructing a ray diagram and then describing the image in terms of its location, size, erectness, and being real or virtual.
9. Determine a quantitative relationship between the object distance, image distance and focal length of the lens ($1/D_o + 1/D_i = 1/f$).
10. Describe the experimental conditions that must be fulfilled in order to observe interference of light predicted by the wave model of light.
11. Describe the pattern produced by a single slit.
12. Describe the factors involved in determining the resolution of images.
13. Apply the concept of interference to explain common observations such as colors in oil slicks, colors in soap films, Newton's rings in slides, etc.
14. Describe and explain the behavior of light in transparent and opaque materials.
15. Apply light behavior to either the particle or the wave model of light.
16. Describe the photoelectric effect and show the failure of the wave model to explain it.

READING

Chapter 14: pages 519-549

Chapter 15: pages 561-586

Chapter 16: pages 597-619

QUESTIONS & PROBLEMS

Chapter 14: pg. 525 pr. 1, 2 pg. 536 pr. 1, 2 pg. 540 pr. 1,2 pg. 542 pr. 2,4
pg. 550 pr. 2, 12, 16, 21, 23, 25, 26, 27, 37, 38, 43, 51

Chapter 15: pg. 567 pr. 3 pg. 576 pr. 1, 2 pg. 585 pr. 3, 4 pg. 587 pr. 4, 7, 11, 15, 24, 29

Chapter 16: pg. 620 pr. 1, 2, 12, 14, 25