Name _____ Period _____ Guide Sheet October 20, 2004

Optics
Unit 3

Objectives; The student will be able to:

1. Describe the image produced by a plane mirror.
2. Explain the origin of a parallel ray.
3. Explain the rules of ray tracing in concave mirrors.
4. Define spherical aberration and describe uses of parabolic mirrors.
5. Distinguish between real and virtual images.
6. Explain with diagrams how concave mirrors form real and virtual images locate the images with ray diagrams; using the mirror equation to calculate image location and magnification.
7. Explain how convex mirrors form virtual images using ray diagrams; locate the images and calculate image locations and magnification with mirror equations.
8. Differentiate between concave and convex lenses.
9. Describe formation of real and virtual images by convex lenses; locate the images with ray diagrams; calculate image location and size using lens equations.
10. Describe formation of virtual images by concave lenses; locate the images with ray diagrams; calculate image location and size.
11. Display an understanding of how light falling on two slits produces a pattern of dark and bright bands on a screen.
12. Understand the geometrical interpretation of two-slit interference.
13. Demonstrate an ability to calculate the wavelength of using a two slit interference pattern
14. Explain geometrically how single-slit diffraction patterns occur; use the derived equation to relate the pattern with to slit with and light wavelength.
15. Explain the interference pattern formed by the diffraction grating.
16. Explain how diffraction effects limit the resolution of a lens.
17. Define the following terms and add them to your vocabulary:

concave mirror	object	convex mirror	monochromatic light
convex lens	plane mirror	principal axis	chromatic aberration
focal length	diffraction grating	focal point	achromatic lens
virtual image	image	lens/mirror equation	real image
lens	erect image	spherical aberration	
magnification	concave lens		

Activities:

3-1 Define the terms in objective 17.
3-2 Read and outline18.1 in your text book, page 416 - 428.
3-3 Spherical mirror ray diagram worksheet.
3-4 Lab 3-A: Concave and Convex Mirrors
3-5 Questions and Problems pg439-40 #3, 8, 14, 25, 26, 28, Bonus 30
3-6 Read and outline 18.2 in your text book, page429 - 439.
3-7 Lens ray diagrams worksheet.
3-8 Lab 3-B: Concave and Convex Lenses
3-9 Questions and Problems pg440 #11, 21, 36, 37, 38
3-10 Read and outline19.1 in your text book, page 443 - 451.
3-11 Interference of light
3-12 Read and outline19.2 in your text book, page452 - 457.
3-13 Diffraction of light
3-14 Questions and Problems pg766 #3, 6, 12, 14
3-15 Test