

## **Review Guide for Unit Test for Physics/Optic block.**

**The student should be able to answer questions on the following topics.**

**The question may take the form of ‘short answer’ , draw a sketch (to scale) and or solve problems.**

1. The Ray Model of light is based on what principal?
2. Flat mirrors introduce us to terms such as image, objects and angles of incidence and reflection. Given some sample ‘student rays’ could you complete the diagram and add the rest of the rays and label them correctly?
3. The student should understand the concept of ‘the normal’ including how to identify WHERE to draw it and how to make measurements based on it.
4. Symbols such as  $D_i$ ,  $D_o$  and ‘f’ ..., their meaning and how to use the Lens equation to solve for each given specific set of unknowns.
5. How does the focal point for a curved mirror related to the Center of Curvature for that same mirror?
6. How does the focal point for a lens related to the curvature of the lens itself?
7. How image distance, object distance, center of curvature and focal point are related to each other.
8. Using the Lens equation to solve for one element, given the other three.
9. Uncertainty in measurement and calculations. Understand the difference between Uncertainty and Percent Uncertainty.. and when to use them!
10. Given a sample student data set or sample geometric shape, be able to measure dimensions on your own and be able to include the uncertainty through the math and into the final calculation.
11. How are cones and optic nerve are evolved to perceive color (why do we see Yellow when only Green and Blue are present?). (take a look at the website I linked into [Clarkrules.com/Optics](http://Clarkrules.com/Optics) Week 3: Structure and Function of the eye.
12. What exactly the index of Refraction is a measure of.
13. How to use Snell’s Law to calculate the Index of Refraction for a substance.
14. How to determine the Index of Refraction given a student data set (i.e., sight-lines the student drew during their lab)..
15. Be able to use Snell’s Law to PREDICT the degree of bending a light ray will go through for a given angle of incidence through a given material with a given Index of refraction.
16. Uncertainty in Measurement and calculations and how to document using significant figures. Knowing how to carry through the uncertainty in measurement and calculations through proper application of the ‘rules of significance’ in your calculations.
17. Transmission of light through the Atmosphere as a function of wavelength.
18. How Earth’s atmosphere interacts with solar radiation both incoming and outgoing back into Space. (take a look the links for Atmospheric Transmission and graphics located on Week 4 of [Clarkrules.com](http://Clarkrules.com) for more)
19. What kind of research is being done with SLAC’s X-Ray LASER, what kind of research is being done at the Large Hadron Collider.