

Refraction prelab preparation

Worksheets, videos and all other lab-related content is located at:

<http://www.physics.brocku.ca/Courses/1P92/lab-manual>

- As an introduction to refraction, watch the video at:

<https://www.youtube.com/watch?v=95V-QJYZ2Dw>.

- To get a feel for how changing the indexes of refraction change the path of refracted light, play with the “Intro” section of the following simulation:

<https://phet.colorado.edu/en/simulation/bending-light>

Move the sliders to change the indexes of refraction of the two media, and observe what happens to the refracted ray. (Also notice what happens to the reflected ray.)

- Now move to the “Prisms” section of this simulation. Select the triangular prism and drag it into the path of the light. Grab the “knob” at one corner of the prism and rotate the prism, noticing the change in direction of the emerging ray. There will be a critical angle for which the incident light reflects at the “second” interface instead of passing through. Play with this to get a feel for when this happens.
- To get a feel for other concepts underlying this experiment, play with the following simulation:

<https://phet.colorado.edu/en/simulation/geometric-optics>

Move the lens around and observe what happens. You can also make use of the sliders to change the curvature of the lens and its index of refraction; observe what happens when you do this. You can also click on the “Virtual Image” check-box to show a virtual image when one is present.

- In Part 4 of the Experiment you are asked to determine the index of refraction of a lens. How will you do this? Which measurements will you make? How many measurements will you make? Which calculations will be needed? How will you determine the index of refraction using your measurements? How will you minimize error? Write a paragraph to summarize your method and to explain the answers to the questions asked here.
- In Part 5 of the Experiment you are asked to determine the focal length of a lens. How will you do this? Which measurements will you make? How many measurements will you make? Which calculations will be needed? How will you determine the focal length using your measurements? How will you minimize error? Write a paragraph to summarize your method and to explain the answers to the questions asked here.
- Read through the rest of the lab instructions for this experiment in this document.
- Login to Turnitin and submit your file in your prelab assignment before the “Due” time and date shown. Do not wait until the last minute to submit your report. Turnitin will not accept submissions after the set due date/time. Note that overdue prelab reports are assigned a grade of zero.

- Print a copy of this experiment to bring to your scheduled lab session. The data, observations and notes entered on these pages will be needed when you write your lab report. Compile these printouts to create a lab book for the course.

CONGRATULATIONS! YOU ARE NOW READY TO PROCEED WITH THE EXPERIMENT!