

Refraction Activity

Purpose: To calculate the speed of light in a certain type of glass and tap water by first determining the index of refraction of each substance.

Materials: ray box with single slit (or a red/green laser), Protractor, ruler

Procedure:

1. Place the Plexiglas on the ray.
2. With the ray box, shine a ray of light at about 5° .
3. Mark the angle of refraction (and angle of incidence if required).
4. Do steps 2 & 3 in 5° increments (should have 6 to 8 angles).
5. Repeat the experiment for tap water.
6. Measure the critical angle for each as light goes into the air.
7. Open the "Snell's Law Lab" Excel file and enter your data.
8. Use Excel to create a line of best fit.

Analysis Questions

1. Use a line of best fit to determine the slope of the graph. Use that slope to determine the index of refraction for glass and the tap water.
2. Use your calculation of n_i to determine the speed of light in the glass and water.
3. Calculate the critical angle for your piece of glass and water. Does it agree with your measurement?