

ReFRACtion Lab (MAKEUP Version if Absent)

This lab is based on Experiment #4 in PASCO's Introductory Optics System Manual.

Purpose

To observe what happens to rays of light refract at a lens

Procedure

1. Go to phet.colorado.edu. Type in “*bending light*” into the search bar. Make sure that you are using the HTML5 simulation.
2. Click play. Then click “More Tools”
3. Make sure the checkboxes in the lower left corner labeled “Normal” and “Angles” are checked.
4. Turn on the laser and then drag it to change the angle of incidence.
5. Set up the simulation so that the laser is traveling from air to glass. Measure the angles of refraction and reflection for each angle of incidence (Figure 1).
6. Flip the simulation so that the laser is traveling from glass to air. Measure the angles of refraction and reflection for each angle of incidence (Figure 2).

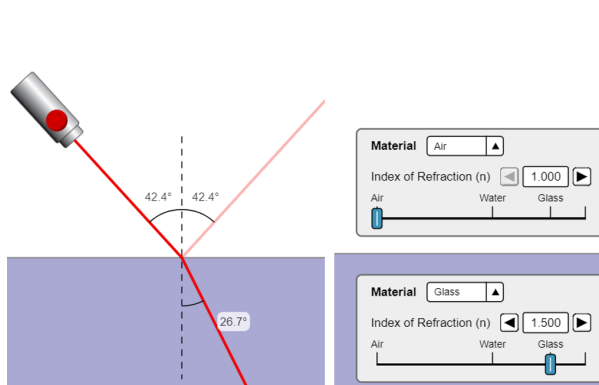


Figure 1: Air → Glass

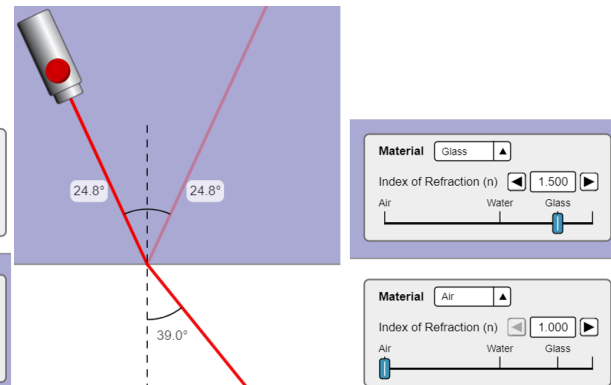


Figure 2: Glass → Air

Name:

Date:

Period:

Data

Not all of the rays will be visible. If a ray is not visible, write “n.v.” for “not visible.”

Angles for Air → Glass		
Incidence	Refraction	Reflection
10°		
20°		
30°		
40°		
50°		
60°		
70°		
80°		

Angles for Glass → Air		
Incidence	Refraction	Reflection
10°		
20°		
30°		
40°		
50°		
60°		
70°		
80°		

Analysis

1. The results of the two trials (**Air** → **Glass** and **Glass** → **Air**) are not the same. What pattern do you notice with the angles of refraction? (*i.e.* Are they larger or smaller than the angle of incidence?)
2. What difficulties did you have at large angles? Why do you think these difficulties arose?
3. What did you notice about the angle of reFLEction?