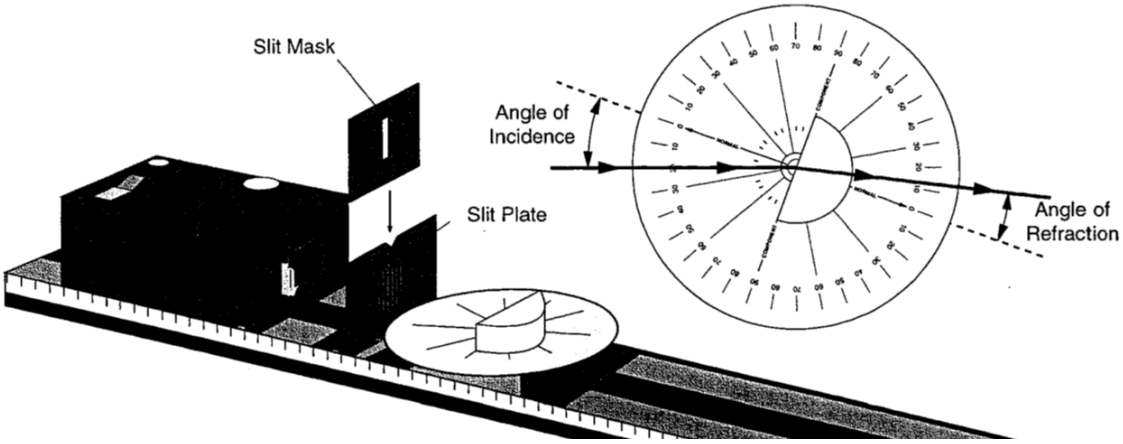
Name: Date: Period:

ReFRACtion Lab

This lab is based on Experiment #4 in PASCO's Introductory Optics System Manual and the first illustration is borrowed from it.

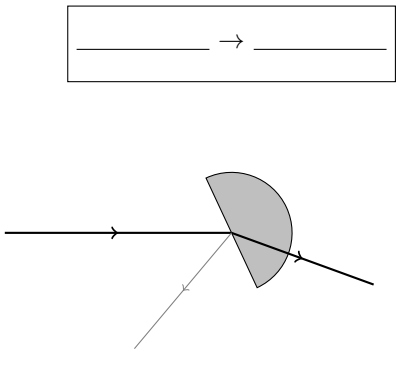
Purpose

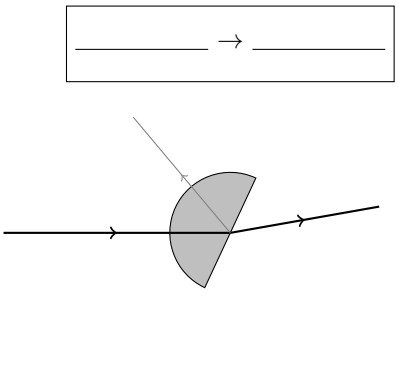
To observe what happens to rays of light refract at a lens



Procedure

1. Set up the experiment as indicated above.
2. Adjust the components so that a single ray of light is aligned with the bold arrow labeled "normal" on the Ray Table Degree Scale.
3. Carefully align the flat part of the Cylindrical Lens along the bold arrow labeled "component"" on the Ray Table Degree Scale. Adjust the placement of the lens so that the angle of refraction is 0°. From this point forward, be careful when adjusting the Ray Table so that the lens does not slip.
4. Rotate the Ray Table so that the Angle of Incidence changes. Record the angle of refraction and the angle of reflection.
5. We will need to take data for both **Air** → **Glass** Refraction and **Glass** → **Air** Refraction. Label each situation and label the incident, reflected, and refracted ray.





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. Take a look at how the light bends. It only bends at the flat surface; it does not bend at the curved surface of the lens. Why do you suppose this is?

2. 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?)

3. What difficulties did you have at large angles? Why do you think these difficulties arose?

4. What did you notice about the angle of reFLECtion?