Name

Section





A1.5

conduct inquiries, controlling variables, safely & accurately to collect observations & data

A1.6

gather data from laboratory sources, and organize and record the data

A1.10

draw conclusions based on inquiry results and justify their conclusions

A1.12

use appropriate numeric, symbolic, and graphic modes of representation

E2.1

use appropriate terminology related to light and optics

E2.4

investigate the refraction of light as it passes through different media, compiling and analysing data to determine if there is a trend

E2.4

identify the factors that affect the refraction of light

Refraction Lab

Geometric Optics

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Recording Glass-Air Refraction



Exploring the Data

analysis

Record incident and refracted angles on the following tables.

Air-Glass		Glass-Air	
Incident Angle	Refracted Angle	Incident Angle	Refracted Angle
0		0	
10		10	
20		20	
30		30	
40		40	
50		50	
60		60	
70		70	
80		80	

What do you notice about the refracted angles?

Plot the angle of refraction as a function of the angle of incidence. What do you notice about the graphs?





Quantifying Snell's Law



The **Law of Refraction** (also called Snell's Law) says that the ratio of the sine of the angle of incidence to the sine of the angle of refraction is a constant.

When measurements contain angles it is very common for relationships to involve the trigonometric functions: sine, cosine, and tangent. This graph paper is marked using the sine of each angle, so it is easy to compare the ratio of their sines.



Calculating the Index of Refraction

Compare the two graphs you just drew on sine-sine graph paper. What do you notice about them?

Compute the slope of each graph using the following formula: $slope = \frac{\sin \theta_r}{\sin \theta_i}$

What do you notice about the two numbers?