

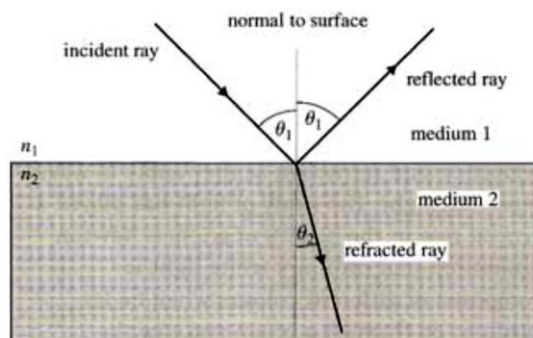
PHYSICS LABORATORY: Investigating Refractive Indices

Background and Task

We have talked about in class how a light wave is always bent toward the normal if going from less dense to more dense media. Some of the wave is reflected and some is refracted. This is because the speed of light actually decreases within a transparent substance (the more optically dense, the more it slows down).

Every optically transparent material has an index of refraction given by:

$$n = \frac{c}{c_m} \quad \text{where } c = \text{speed of light in vacuum, } c_m = \text{speed of light in the media}$$



Source: Physics for the IB Diploma, 5th Ed, Tsokos

Snell's Law says that:

$$\frac{\sin\theta_1}{v_1} = \frac{\sin\theta_2}{v_2} \quad \text{or} \quad n_1 \sin\theta_1 = n_2 \sin\theta_2$$

Your task in this lab is to **come up with an experimental value for the index of refraction for glass**. The process is completely up to you, and you must use only the equipment provided to you in the laboratory.

Data Processing and Collection (DCP)

- ✓ Think very carefully about how you are going to collect and process the data.
- ✓ Think very carefully about your independent, dependent, and controlled variables.
- ✓ A full error analysis with proper treatment of uncertainties is required.
- ✓ Remember that you are responsible for collecting your own data, even if you are working with another person in the lab.

Conclusion and Evaluation (CE)

- ✓ Interpret your results.
- ✓ Compare your experimental value of n for glass to the accepted value.

Remember:

1. Refer to the 'Physics Lab Report Guide' before submitting your report.
2. Attach the 'Physics Lab Report Rubric' as a cover page to your paper copy.
3. Turn in a paper copy to Mr Smith AND upload your report electronically.

You will be marked on Data Collection and Processing (DCP) and Conclusion and Evaluation (CE) for this lab.