**General Physics eJournal 8**

**Reflection and Refraction of Light**

**Instructions:**

Follow the Writeup and fill out the eJournal as you complete the lab activities. Submit your eJournal report by uploading the completed WORD or PDF document to our class Learninghub site. If the Learninghub site is down, email the completed report file directly to a lab TA.

**Preliminaries:**

* Title:
* Name(s):
* Date:
* Time In & Out:

**Plan:**

**Hypothesis**

Form a hypothesis regarding the refraction of light at an interface.

**Experiment Outline**

Briefly describe your plan for testing your hypothesis.

**Equipment List**

* List
* Equipment
* Here

**Action:**

Describe the techniques used to collect data by responding to the bullet point questions:

* How did you measure the incident angles?
* How did you measure the refracted angles?
* How did you measure the critical angle?

*Insert labeled image of your apparatus*

**Results:**

Record the incident and refracted angles in Table I.

**Table I: Incident and Refracted angles for Light at the Air/Water Interface**

|  |  |
| --- | --- |
| **Incident Angles, φ1 (degrees)** | **Refracted Angles, φ2 (degrees)** |
| 0° | 0° |
| 10° |  |
| 20° |  |
| 30° |  |
| 40° |  |
| 50° |  |
| 60° |  |

Record the measured critical angle, φc.

φc = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ degrees

**Analysis:**

Generate a plot of sin(φ1) (y-axis) vs. sin(φ2) (x-axis) and apply a linear fit. Record the slope and compare it to the known index of refraction of water, nwater = 1.33.

*Insert graph of sin(*φ*1) vs sin(*φ*2)*

**Table II: Comparison between slope and index of refraction of water**

|  |  |  |
| --- | --- | --- |
| **Known Index, nwater** | **Slope, m** | **% Error** |
| 1.33 |  |  |

Compute the index of refraction of water, nc, from the measured critical angle and compare it to the known index of refraction of water, nwater = 1.33.

**Table III: Comparison between calculated index and known index of refraction of water**

|  |  |  |
| --- | --- | --- |
| **Known Index, nwater** | **Calculated Index, nc** | **% Error** |
| 1.33 |  |  |

**Conclusion:**

Interpret your results in light of your hypothetical predictions. How well did your hypothesis match the results? Which method (Snell’s Law or Critical Angle) would you consider to be more accurate in determining the index of refraction of a material? How might you improve this experiment or explore it further?