

LAE

Laboratory #10

Reflection and Refraction

Introduction:

In this lab we measured a mathematical relationship between the distance of an object in front of a mirror and the distance of the image "behind" the mirror. We also measured the mathematical relationship between the actual depth of an object and the apparent depth of an object seen below the surface of the water.

Equipment:

- Mirror
- Doll
- Water tanks (different depth)
- Coins
- Metric ruler

Procedure:

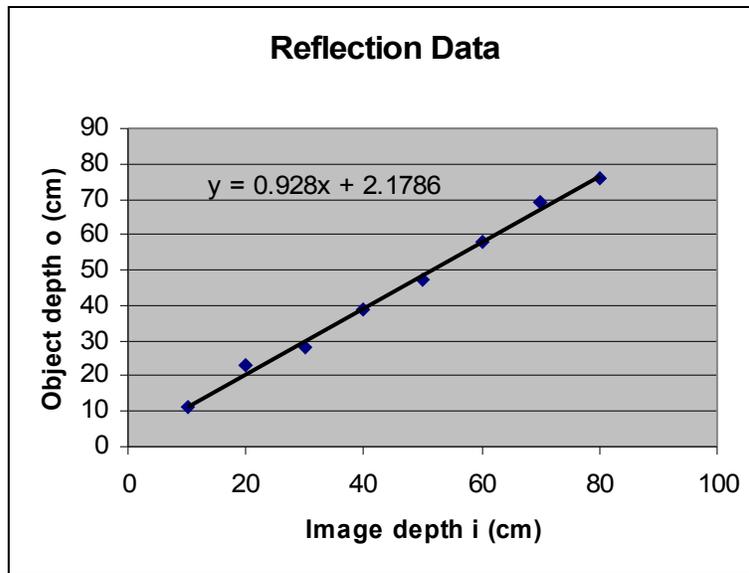
In this lab, we measured the depths of the object in the water and the image depth in the water. We also measured the reflection of an image depth behind the mirror. So first we split into groups, two to three people in the group, so me, Evelynn, and Kioleen formed one group. So our started our measurement by measured the refraction of the object under the water. We did two different kinds of measurements, first we measure the image depth to the surface of the water and after that we measured the object depth to the surface of the water. We did our measurement by using different kinds of water containers. After measuring the refraction, we went on and measured the reflection of an image behind the

mirror. We measured the distance of the image by using the yard stick and the mirror.

Data Table one: (Reflection Data)

Image depth I (cm)	Object depth o (cm)
10	11.5
20	23
30	28
40	39
50	47
60	58
70	69
80	76

Data Chart One:

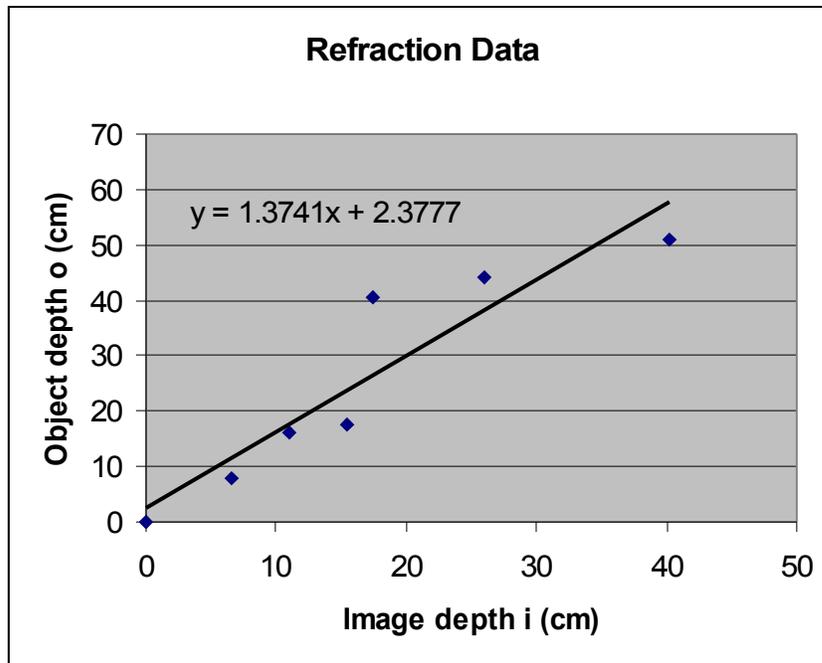


Data Table Two :(Refraction Data)

Image depth I (cm)	Object depth o (cm)
0	0
11	16
40.2	51

26	44
17.5	40.5
15.5	17.5
6.5	8

Data Chart Two:



Data Analysis:

- The reflection slope is 0.928
- The reflection intercept is 2.18
- Refraction slope is 1.37
- Refraction intercept is 2.38

Conclusion:

There is a mathematical relationship for the reflection and the refraction. Both of their relationship is linear. There is no difficulty I encounter. Both of the slopes for reflection and refraction are not close to (percentage difference $\leq 10\%$) the theoretical predicted value. The hypothesis is confirmed because there is a mathematical relationship for reflection and refraction.