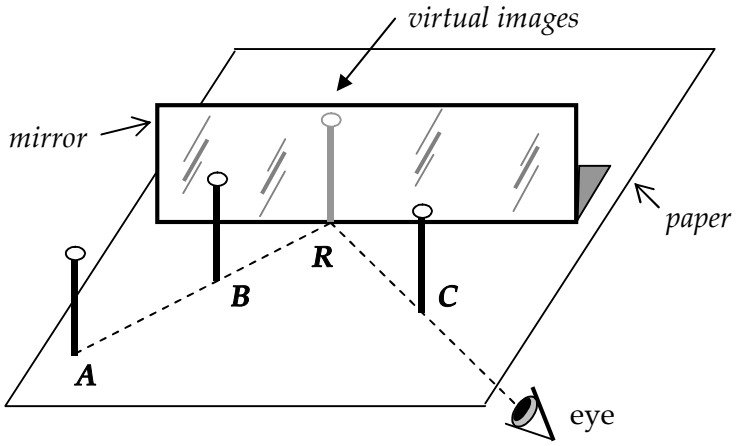
Reflection of Light

Introduction:

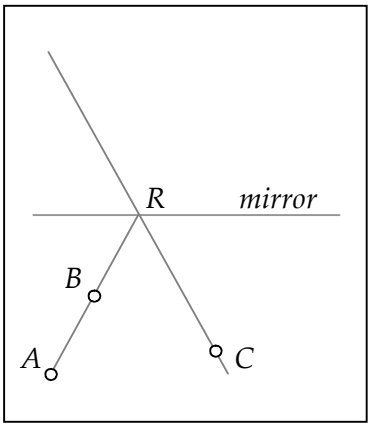
The purpose of this lab is to verify the Law of Reflection: *Angle of Incidence = Angle of Reflection*.

Your group will need a corkboard, an 8½ × 11 in. piece of paper, a plane mirror, an upright mirror holder, a few large pins, a pencil, a protractor, masking tape, and a ruler.

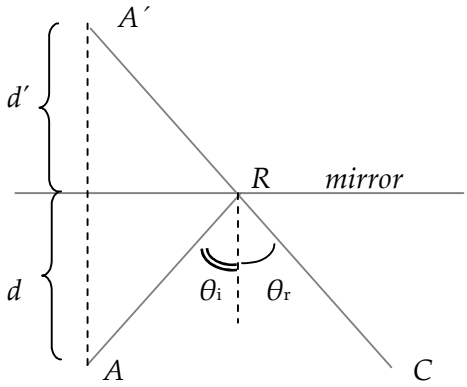
Procedure:



1) Tape the paper to the corkboard. Stand the mirror upright at the center. Draw a line along the bottom edge of the mirror so that the position of the mirror is marked on the paper.
2) Push pin A and pin B into your paper as shown in the above diagram. Be sure that the pins are perpendicular to the paper.
3) Move your head so that your line of sight is in the same direction as the eye shown above. Your eyes should be about 1 cm above the paper.
4) Look for the reflections (*virtual images*) of pins A and B in the mirror. Move your head until the two reflections line up. This is point R in the diagram.
5) Push pin C into your paper so that *it also lines up with the reflections of pins A and B*.
6) Remove the mirror and pins A, B, and C. Use your ruler to draw ray AR (*incident ray*) and RC (*reflected ray*) as shown below. Extend ray RC behind the mirror.



7) Use your protractor and your ruler to draw a line perpendicular to the mirror at point R (see diagram below). Measure (to the nearest 0.5°) the angle of incidence θ_i and the angle of reflection θ_r and record their values in the table on your data sheet.
8) Draw a line beginning at point A perpendicular to the mirror. Make sure that this line extends to the opposite side and crosses ray RC (at point A′). Measure (to the nearest 0.1 cm) the distance d from point A to the mirror and the distance d' from the mirror to point A′. Record these in the table on your data sheet.



9) Return pin A to its original position. Push pin B into four other positions and repeat Steps 3 through 8.

Each student is required to submit a completed data sheet by the end of the lab period.

Name _____ **Date** _____

Partners _____

Reflection of Light Data Sheet

θ_i [degrees]	θ_r [degrees]	% error

d [cm]	d' [cm]	% error

Use the following formula for both tables: % error = $\frac{100 \cdot |\text{Column1} - \text{Column2}|}{\text{Column1}}$

QUESTIONS

1) What are the differences between a *real* and a *virtual* image?

2) Is it possible for a plane mirror to form a *real* image? (Yes/No) Explain your answer.