

Physics Lab

Pinhole Camera

Name: _____

Purpose: To discover how light rays travel.

Materials:

Large coffee can with translucent cover
5 cm masking tape
40 watt light bulb (non-frosted) in fixture
Small nail (#2 finishing)
Large nail (#8 common)

Procedure:

1. Select a coffee can and punch two holes in the bottom-one with the small nail and one with the large nail. (This may have already been done)
2. Place the masking tape over the larger hole.
3. Place the lid on the coffee can.
4. Turn on the 40-watt bulb. Turn off the room lights.
5. Point the hole at the light and notice the pattern (image) formed on the cover of the can. (See sketch below)
6. Draw the path of the light to show the orientation of the image.

Observations and Data:

1. Is the image reversed right to left? Design an activity to find out. Record your results.
2. Move the can farther away from the bulb. Notice how the image changes. Record your observations.
3. Measure for three values of d_o , d_i , h_o , and h_i .

Analysis:

1. Make a drawing to show how the image gets smaller as the can is moved away from the light.
2. Predict how the image formed by the nail hole would compare to the image formed by the pinhole. List the similarities and differences.
3. Check your predictions. Record your results.
4. Try to determine a mathematical rule between h_i , h_o , d_i , and d_o . Show your results.

Application:

Your eye is a form of pinhole camera. Would you expect the images to be upside down? Explain.

Conclusion:

1. What did you learn from this experiment?
2. How can this be applied to daily activity?
3. What mistakes or errors could have occurred?