

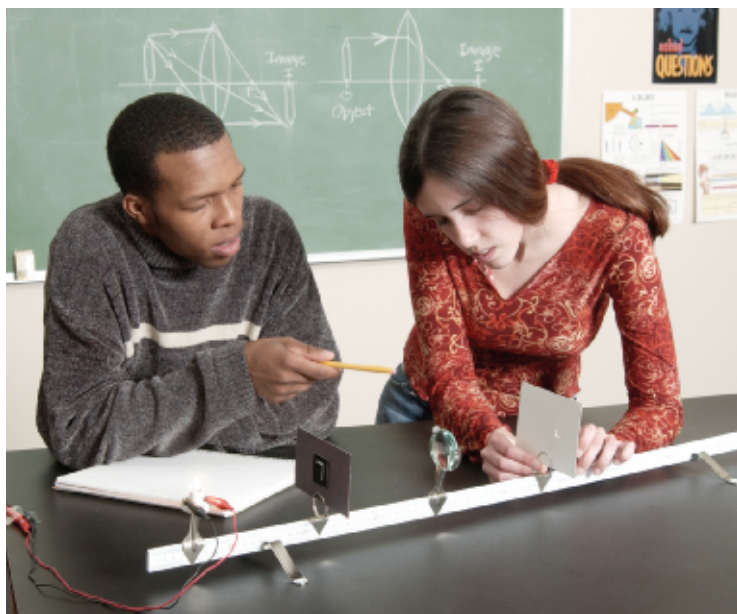
6. Repeat step 5 four times with the lens at a different position each time. These positions should give the following object distances:

- a. exactly twice the focal length
- b. between one and two focal lengths
- c. exactly one focal length
- d. less than one focal length

Record all measurements as in step 5. If you do not see an image, place Xs in your data table for that trial.

7. Set the object distance less than one focal length, remove the image screen, and place your eye close to the lens. Look through the lens at the object, and record your observations.

8. Clean up your work area. Put equipment away safely. Recycle or dispose of used materials as directed by your teacher.



**Figure 1**

**Step 3:** Make sure the image screen is securely held in the screen support rider to prevent its moving during the experiment.

**Step 4:** Use the illuminated object screen as the object for this part of the lab.

## ANALYSIS

1. **Organizing Data** For each trial recorded in the data table, perform the following calculations:

- a. Find the reciprocal of the object distance,  $p$ .
- b. Find the reciprocal of the image distance,  $q$ .
- c. Add the reciprocals found in (a) and (b).
- d. Find the inverse of your answer in (c).

2. **Organizing Data** For each trial, perform the following calculations:

- a. Find the ratio between  $q$  and  $p$ .
- b. Find the ratio between  $h_i$  and  $h_o$ .

## CONCLUSIONS

3. **Recognizing Patterns** Compare the inverse of the sum of the reciprocals for each trial with the focal length of the lens. What is the relationship? Is this true for all trials? Explain.

4. **Recognizing Patterns** For each trial, compare the ratios found in item 2.

- a. Based on your results, what physical quantity is expressed by each of the ratios found in item 2?
- b. What is the relationship between the two ratios for each trial? Is this true for all trials? Explain.