Name ____ Hour ______________


Understanding Lenses Lab

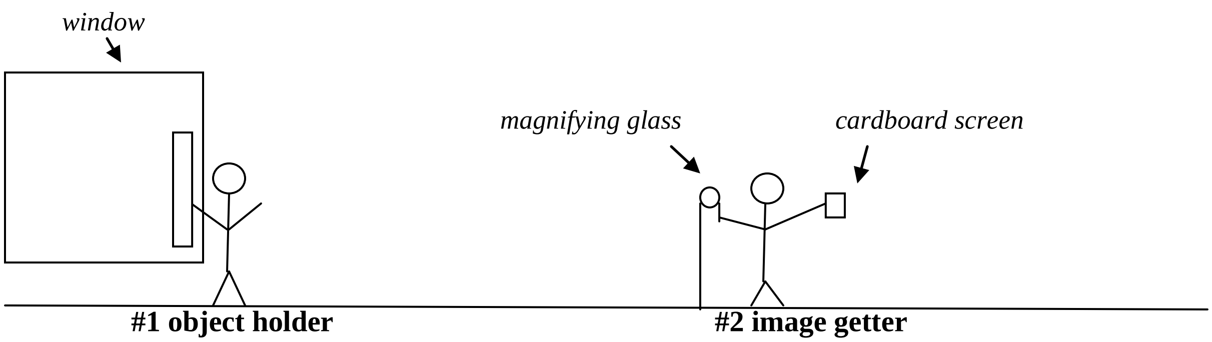

_______ points, due_____________

<u>Purpose</u>:

In the lab you will be looking at the relationships between the size of an image and the size of the object as well as the distance the image is from a lens and the distance the object is from the lens. *A <u>converging lens</u> works best for this lab because the image can be captured and measured (real image).*

<u>Review before you begin</u>:

In the lab, we will be using the window as our object and screens will capture our image.



____

****Have everyone in your group answer these and check them off to get a <u>magnifying glass</u>.****

1) Define **<u>and</u>** label all of the variables in the above drawing. ↑

p- ____

q- ____

h_o -____

h_i -____

2) **i)** What is a real image?

ii) What is a virtual image?

3) Do a quick sketch of what the ray diagrams will look like in this lab. Your object will be past the focal point of a converging lens. Look at your notes if you need help.

- -

4) What type of image will you get in this lab? _______________ **How do you know?**

Name _____ Hour _____

KEEP UNITS CONSISTENT! (ALL CM OR M)

Data:

Part 1: Keep **the distance to the window constant** and change the height of the object.

Keep p and q the same but change ho (height of meterstick)

p *(constant)*	q (measure this!) Constant!	h_o (This will change)	h_i *(think- is this pos. or neg?)*	m *(pos or neg?) Calculate using hi / ho*

Part 2: In this part, keep **the height of the object constant** and change the distance to the window.

Tip: ***Start about 1 m away.*** *For each row of data, take one big step away from the window.*

p (measure this!)	q (measure this!) Constant!	h_o *(constant)*	h_i *(pos or neg?)*	m *(pos or neg?) Calculate using hi / ho*

Analysis:

1) Should your magnification be positive or negative? Why? Fix it in your chart if needed.

2) What was your average magnification for part 1? _____ part 2? _____

3) Calculate the focal length for your lens. Use one row of data that seems to be a good one.

4) Why is q positive? _____

5) **On separate paper**- draw a scaled ray diagram for one row of data in Part 2, not Part 1. Hint: Choose the one when you were closest to the wall (smallest p value) as it will be easier to scale and use the **focal length calculated in #3**. Staple your scaled ray diagram to the back of this lab. **Make sure to measure q and h_i.**