Name _____ Hour _____

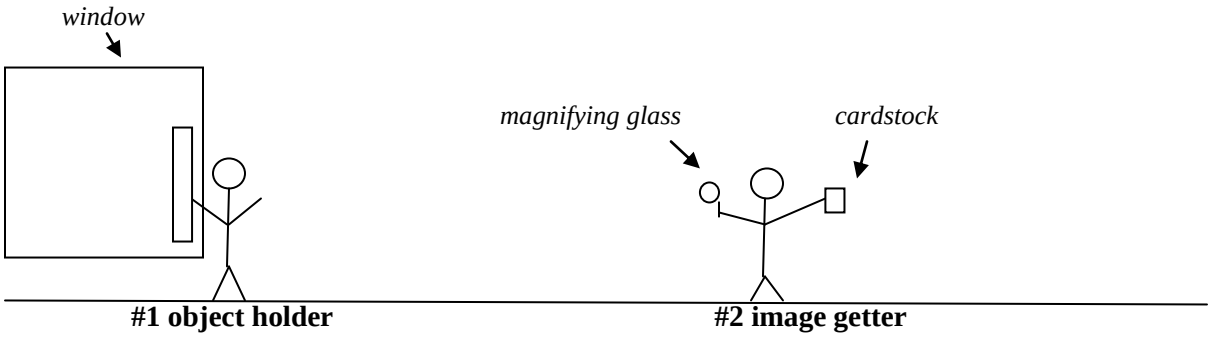

Lenses Lab


Purpose:

In the lab you will be looking at the relationships between hi and ho as well as between p and q. *A converging lens works best for this lab because the image can be **projected** and measured (real image).*

Review before you begin:

In the lab, we will be using a meterstick in the window as our object and the cardstock will capture our projected image.



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

1) Define **and** LABEL ON THE DRAWING all of the variables.

_____- distance from meterstick in window to the lens

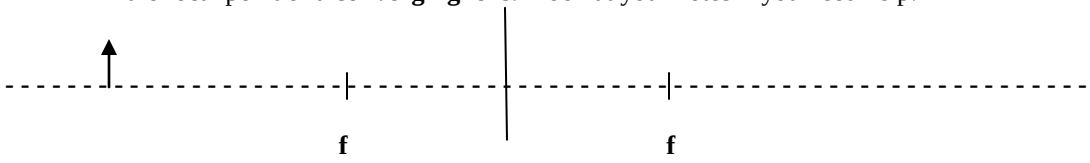
_____- distance from lens to where the image is projected on the card

_____ – height of the meterstick in the window

_____- height of the image on the card

2) What is the difference between a real and 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 _____

Part 1:

KEEP UNITS IN CM!

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

p *(constant)*	q (measure this but keep it constant!)	h_o (This will change)	h_i *(think- is this pos. or neg?)*	m *(pos or neg?) Calculate using hi / ho*
410	11	20	-0.7	
410	11	40	-1.4	
410	11	60	-2	
410	11	80	-2.6	

Part 2:

Keep the ho constant (height of meterstick above hand) but change the distance to the window (p)

p	q (measure this but keep it constant!)	h_o *(constant)*	h_i *(pos or neg?)*	m *(pos or neg?) Calculate using hi / ho*
100	13	50	-1.5	
200	13	50	-1.6	
400	13	50	-1.7	
500	13	50	-1.6	

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 p and q from a row in Part 2 that seems to be accurate.

4) Why is q positive? _____

5) Draw a scaled ray diagram when p=100 cm in Part 2. Use the **focal length calculated in #3**.
Measure q and h_i from your drawing! Scale 1 cm = 20 cm.

Don't forget to scale back!

q =

hi =