

## Lenses Virtual Lab using PhET Geometric Optics

Name \_\_\_\_\_

### Materials:

Computer, Internet connection, and ruler

Hour \_\_\_\_\_

### Objectives:

- To demonstrate the formation of images from convex and concave lenses.
- To identify the type of image formed by convex and concave lenses.
- To confirm the lens equations.

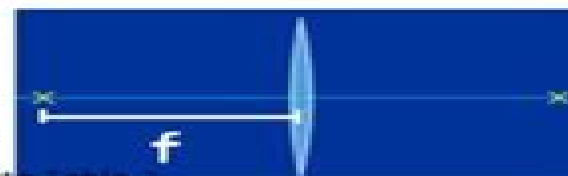
### Procedure: Convex Lens

1. Go to **PhET Simulations to Play with Sims to Physics to Light and Radiation to Geometric Optics to Run Now!**
2. Take some time to play with the simulation to get familiar with how it works.
3. Maximize your screen. **Warning:** For the measurements taken in this lab, the ruler in the PhET program will not work. Therefore, we will use a standard ruler measuring from the computer monitor. The scale used to make these measurements will change from computer to computer so once you start, you must finish.
4. In this lab, you will be moving the object to analyze how images are formed. When you are ready to get started be sure that your settings are as follows:



Change  
object to  
yellow  
arrow

5. Using the ruler, measure the distance from  $x$  to the center line of lens. Record in Data Table 1 as  $f$ . Double this value and record as  $2f$ .
6. Measure the height of object ( $h_o$ ) and record.
7. Place the yellow arrow beyond  $2f$ .
8. In Data Table 2, record  $d_o$ ,  $d_i$ ,  $h_i$  and your observations of the image.
9. Move the yellow arrow to  $2f$ . Record in Data Table 2. Your measurements for  $d_o$ ,  $d_i$ ,  $h_i$  and your observations of the image.
10. Move the yellow arrow to between  $2f$  and  $f$ . Record in Data Table 2. Your measurements for  $d_o$ ,  $d_i$ ,  $h_i$  and your observations of the image.
11. Place the yellow arrow at  $f$ . Record your observations. (Having trouble locating image, check your ray diagram sheet) Record your observations in Table 2.
12. Move the yellow arrow to a position that is halfway between  $f$  and the lens. If you can't locate the image, check the box next to Virtual Image. Record your observations in Table 2.



### Data:

Table 1	
Focal length, $f$	
$2f$	
Height of object, $h_o$	

# Lenses Virtual Lab Using Phet Geometric Optics Teacher

**J Ma**



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