

## Classroom Trial

In this activity, you will measure the focal length ( $f$ ) of a convex lens and place an object at various distances from the lens to observe the location, size, and orientation of the images. For the class demo trial, if the object distance can be considered to be at infinity, the distance to the image is equal to the focal length of the lens. Recall that real images can be projected onto a screen; virtual images cannot be projected.

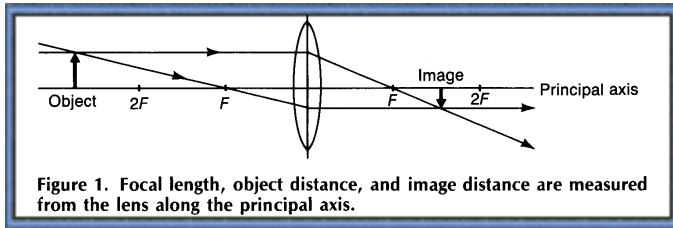
## Measured Focal Length \_\_\_\_\_

### Additional Trials

For the 4 student trials, place the light source above the 10 cm mark on the track. The lens position will change for each of the trials, use the first column for this placement. The object distance is measured from the lens to the candle. Focus an image of the candle onto the card wherever possible, and note the position of the card. The image distance is the separation between the lens and the card.

<b>Lens Location</b>	<b><math>D_o</math></b>	<b>Screen Location with a clear image</b>	<b><math>D_i</math></b>	<b>Magnification: larger or smaller</b>	<b>Direction: inverted or upright</b>	<b>Image: real or virtual</b>
class demo	$\infty$					
Lens at 60cm	50					
Lens at 50cm	40					
Lens at 40cm	30					
Lens at 20cm	10	<b>X</b>				

## Ray Diagrams

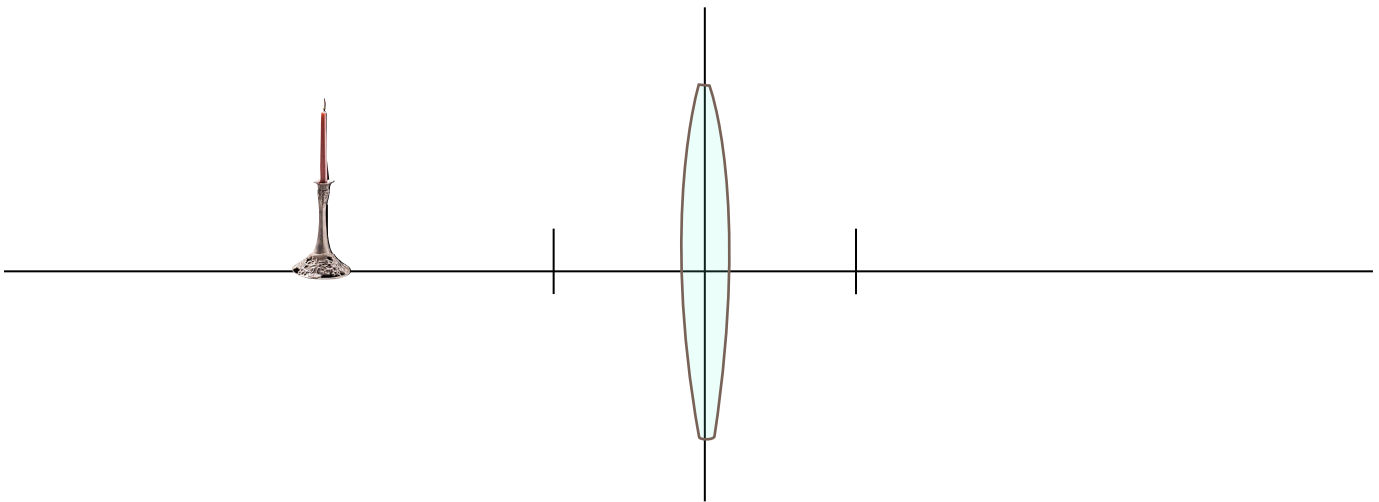


**What was your focal length?**

**Scale: 2cm = \_\_\_\_\_**

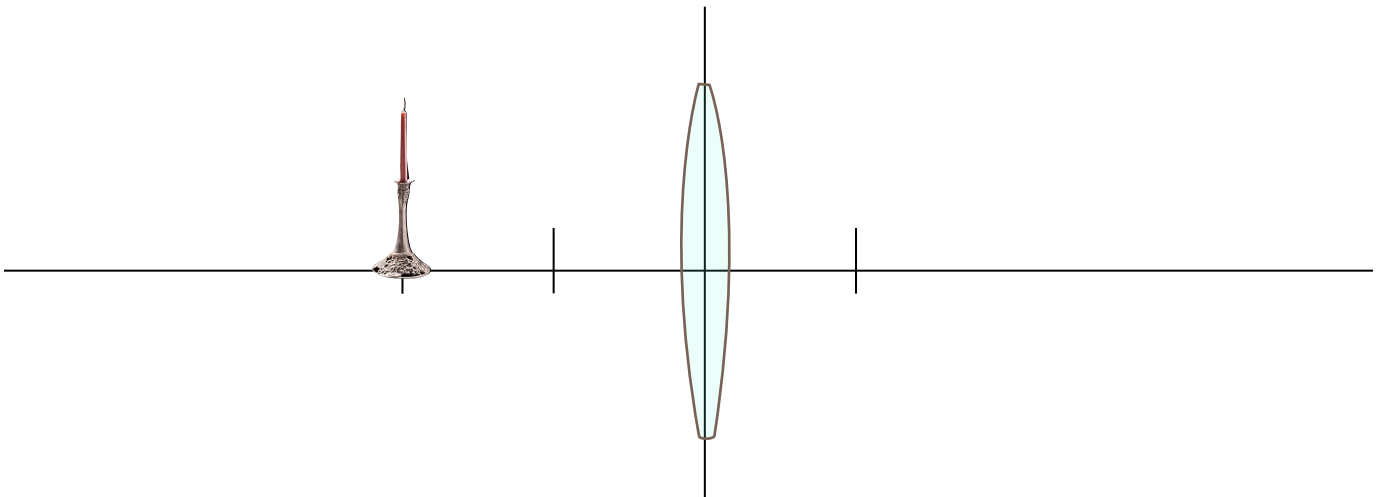
### Trial 1:

Summarize the characteristics of images formed by convex lenses when the object is located beyond 2 focal lengths. Draw the ray diagram for your first trial.



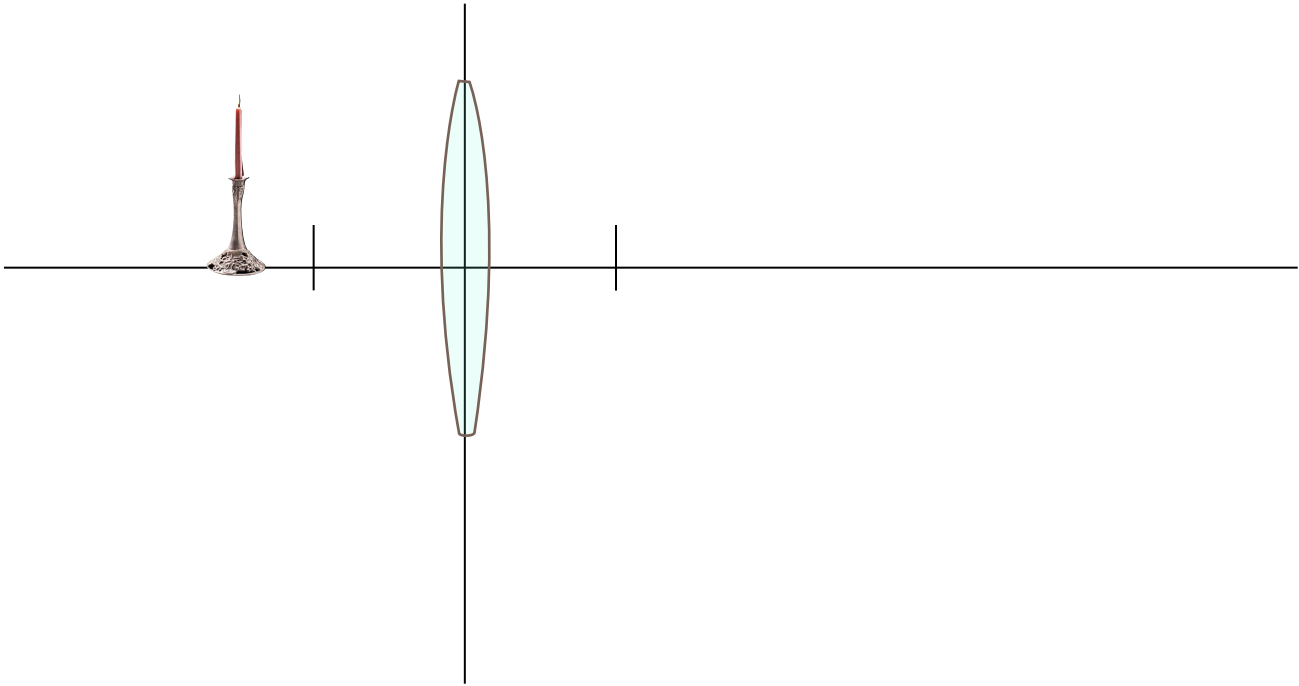
### Trial 2:

Summarize the characteristics of images formed by convex lenses when the object is located at 2 focal lengths. Draw the ray diagram for your second trial.



**Trial 3:**

Summarize the characteristics of images formed by convex lenses when the object is located closer than 2 focal lengths. Draw the ray diagram for your third trial.



**Trial 4:**

Summarize the characteristics of images formed by convex lenses when the object is located inside one focal length. Draw the ray diagram for your fourth trial.

