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.

class demo	**∞**					
Lens Location	***D_o***	***Screen Location*** *with a clear image*	***D_i***	***Magnification:*** *larger or smaller*	***Direction:*** *inverted or upright*	***Image:*** *real or virtual*
Lens at 60cm	**50**					
Lens at 50cm	**40**					
Lens at 40cm	**30**					
Lens at 20cm	**10**					

Ray Diagrams

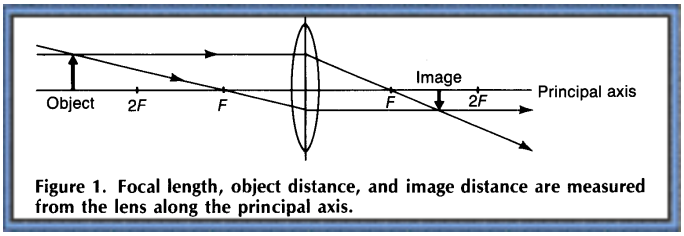


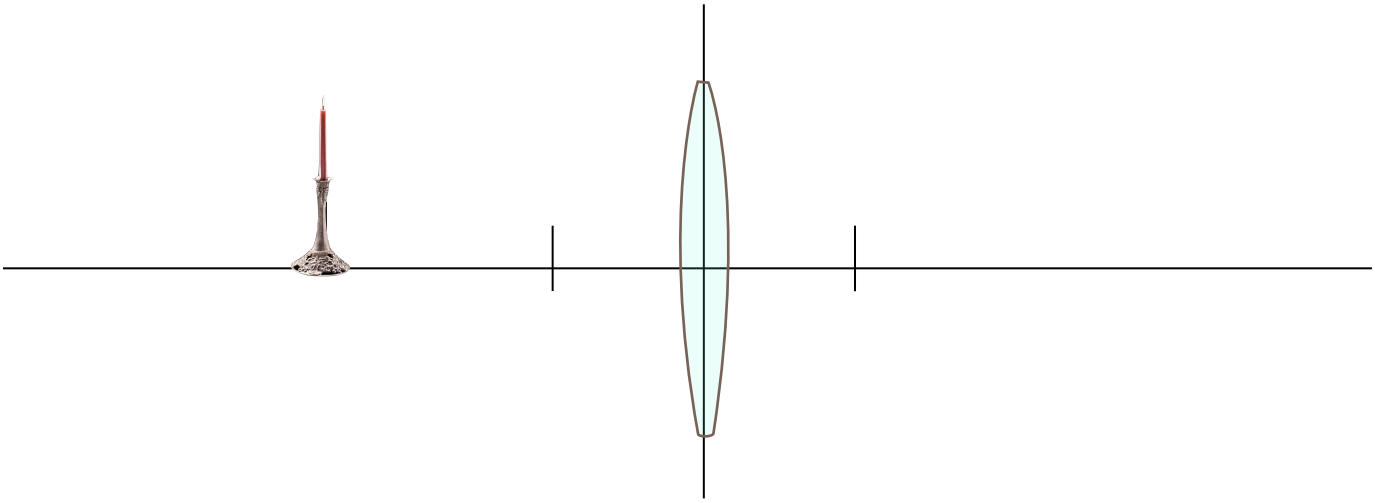
Figure 1. Focal length, object distance, and image distance are measured from the lens along the principal axis.

What was your focal length?

Scale: 2cm = _____

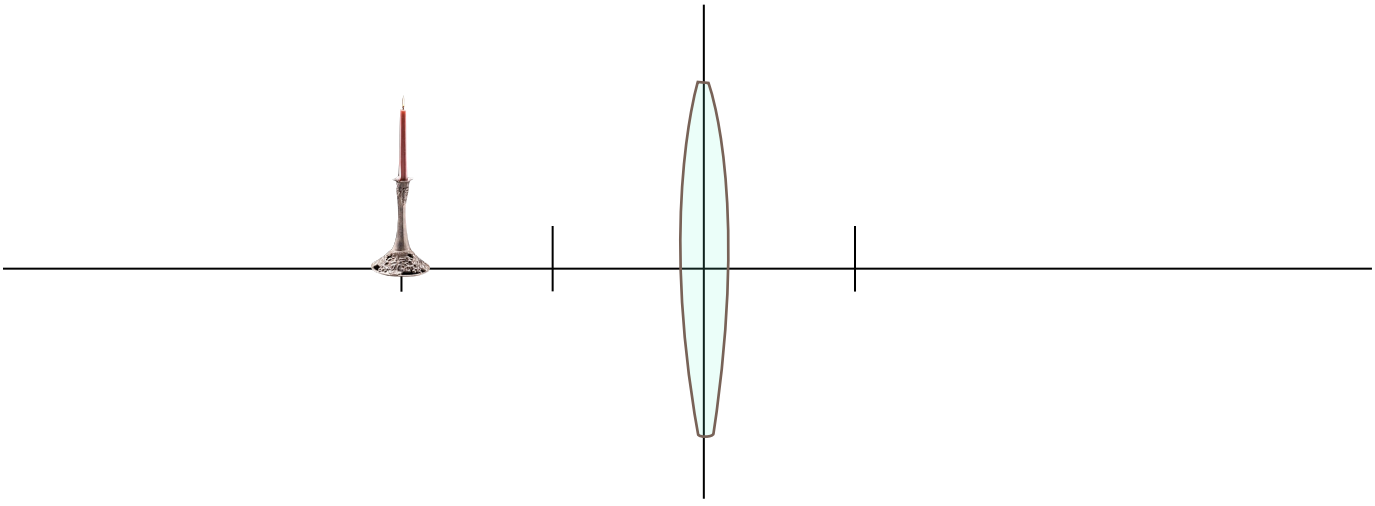
Trial 1:

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.



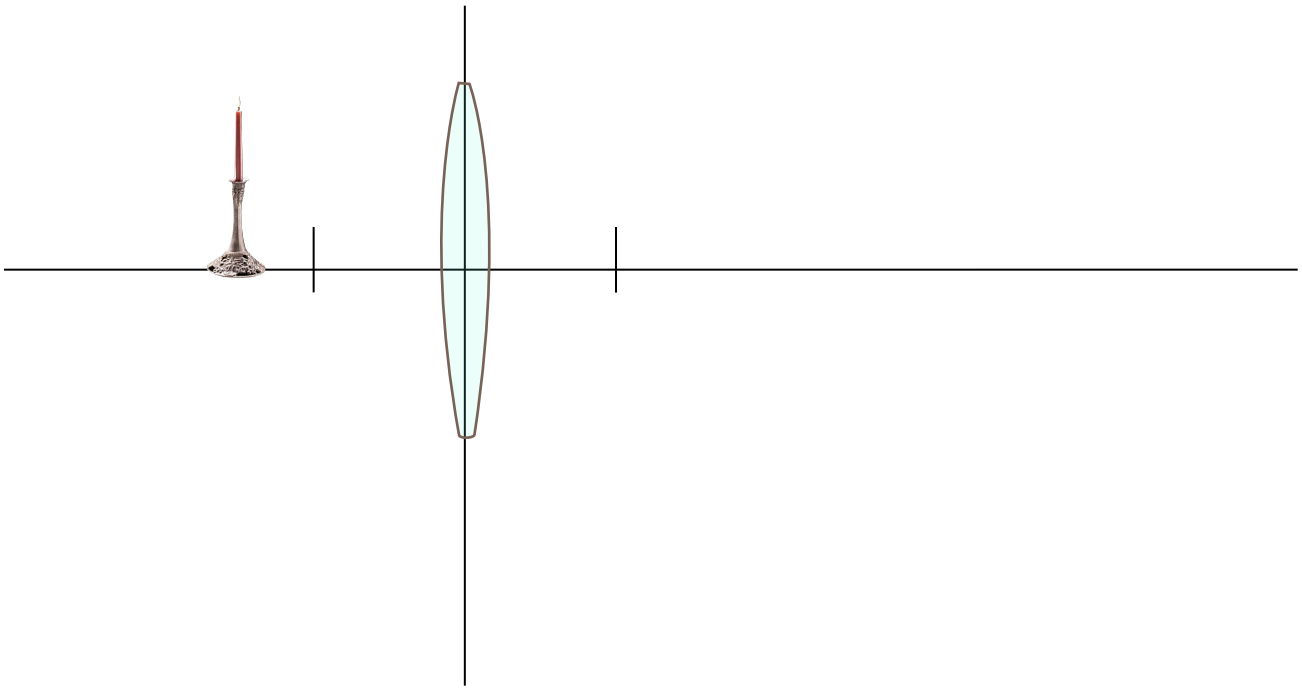
Trial 2:

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.