Name: _____ Group: _____ Date: _____

LAB 35 EXPERIMENT

FORMING IMAGES WITH A CONVERGING LENS

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Goal

Determine how characteristics of images obtained using a converging lens vary according to object position.

1. What is the independent variable in this lab?

_____

2. What is the dependent variable in this lab?

_____

Hypothesis

I think that _____

because _____

_____.

Materials

- converging lens
- optical bench
- screen (white cardboard)
- ray box
- small light bulb on base *or* candle
- 1-m ruler

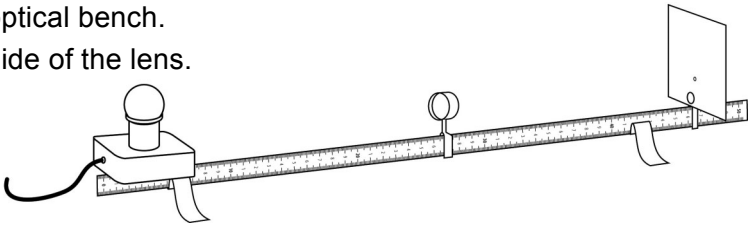
Procedure

1. Secure the lens at the centre of the optical bench.

2. Position the screen on the opposite side of the lens.

3. Identify the principal focal point (F) of the lens with the ray box.

4. Measure and record the height of the light bulb and base.



5. Position the light bulb and base at a distance greater than 2F.

6. Measure and record the distance between the object (light bulb) and the lens.

7. Move the screen until a clear image is obtained.

8. Observe and record the characteristics of the image.

9. Repeat steps 5 to 8 by positioning the object at the following distances:

a) 2F *b)* between 2F and F *c)* F *d)* between F and the lens

10. Put away materials.

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Results

Record your results in the table below. Give the table a title.

Object size (cm):

Title:

Position of object	**Distance between object and lens (cm)**	**Image characteristics**			
		Type (real or virtual)	Distance between image and lens (cm)	Size (cm)	Direction (straight, reversed or inverted)
Greater than 2F					
2F					
Between 2F and F					
F					
Between F and lens					

Analysis of the results

1. How can an image that is real and an image that is virtual be distinguished?

_____

_____

_____

_____

_____

2. When an object is placed closer to the focal point of a lens, what happens to the size of the image?

_____

_____

3. In what circumstances is no image obtained?

_____

_____

4. In what circumstances is a real image obtained?

_____

_____

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5. In what circumstances is a virtual image obtained?

_____

_____

6. Is an image always oriented the same way? Explain your answer.

_____

_____

7. What are the possible sources of error in this lab?

_____

_____

8. How could you improve the protocol for this lab?

_____

_____

Conclusion

1. Complete the following sentences:

a) When an object is positoned beyond the focal point of a converging lens, the image obtained is _____

b) When an object is positioned _____ of a converging lens, no image is obtained.

c) When an object is positioned between the focal point and a converging lens, the image obtained is _____ _____ in size, on _____ side as/of the lens and in the same _____

2. Was your hypothesis confirmed or not? Explain your answer.

_____

_____

Application

Why do the eyes of a person wearing glasses for far-sightedness seem larger?

_____

_____