Name: _____ Group: _____ Date: _____

LAB 33
EXPERIMENT

FORMING IMAGES WITH A PLANE MIRROR

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Goal

Determine how characteristics of images obtained using a plane mirror 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 this _____

Materials

- pencil
- eraser
- ruler
- sheet of white paper
- mirror stand
- plane mirror
- light source (preferably ray box with one-slit comb)
- protractor

Procedure

1. Draw a line on the paper to divide it in half.
2. Secure the mirror to the mirror stand.
3. Place the mirror on the line drawn on the paper.
4. Position the light source so light hits the mirror at an angle other than 90°.
5. Trace the rays of light onto the paper.
6. Mark the position of the light source on the paper.
7. Mark the approximate position of the image on the paper.
8. Move the light source to create a different angle of light.
9. Repeat steps 5 to 7.
10. Repeat steps 8 and 9.
11. Remove the mirror and trace its parameters onto the paper.
12. Measure and record the angles of reflection and incidence for each test.

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13. Measure and record the distance between the light source and the mirror for each test.
14. Measure and record the distance between the image and the mirror for each test.
15. Observe and record the characteristics of the images obtained.
16. Put away materials.

Results

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

Title:

		Test 1	Test 2	Test 3
Angle of incidence (°)				
Angle of reflection (°)				
Distance between object and mirror (cm)				
Distance between image and mirror (cm)				
Image characteristics	Position of image			
	Type of image (real or virtual)			
	Size of image in relation to object			
	Direction of image (straight, reversed or inverted)			

Analysis of the results

1. What is the relationship between the angle of incidence and the angle of reflection?

_____

2. What is the relationship between the position of the object in relation to the mirror and the position of the image in relation to the mirror?

_____

_____

_____

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3. What is the difference between an incident ray and a reflected ray?

4. Describe the characteristics of the images obtained with a plane mirror.

5. What type of rays reach an observer and provide a self-image in a mirror?

6. Extend the lines of the reflected rays drawn on the paper. Where do they point?

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) With a plane mirror, the angle of _____ is always equal to the angle of _____

b) The image obtained with a plane mirror is _____ the same size as the object and of equal _____ from the mirror as the object.

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

Application

Does the position of an observer modify the position of an image? Write a protocol for performing an experiment to answer this question.