Lab – Locating Images in a Plane Mirror Names: _____

When you look at yourself in a plane mirror, you are the object and what you see is the image. An image can be described by four characteristics: **SALT**

Size smaller than the object viewed; larger than the object viewed; same size as the object Viewed.

Attitude Upright (right-side up); Inverted (Upside down)

Location Behind the mirror; closer to the optical device than the object

Type A **real image** can be placed onto a screen; A **virtual (imaginary) image** can be seen only by looking at (or through) the optical device.

In this investigation, you will study how an image is formed in a plane mirror and what the characteristics of the image are.

Materials

- Plane mirror
- Ruler
- Fine-tip pencil
- Blank paper
- Ray box with single-slit window
- Small plane mirror

Procedure

1. Look into a plane mirror.
    a. **What is the size of your image compared with you, the object? _____**

    b. **What is the attitude of your image? _____**

2. On a piece of paper, draw a straight line as long as the mirror. Label this line *mirror*. Place the reflecting surface of the mirror along this line. Draw a solid dot roughly 3 cm in front of the mirror. Label this dot *object*. Get down level with the mirror so you can see the image of the dot. Look at the image from several viewpoints.
    c. **How do you explain why the image appears where it does?**

3. You can use the ray box and light rays to account for the image you see. Aim an incident ray from the ray box through the dot. Draw both the incident and reflected rays.

4. Move the ray box, and aim a second ray through the object. Again, draw the incident and reflected rays.

5. You can now use the rays to explain where the image is located. Use a ruler to draw broken lines extending the reflected rays back behind the mirror. Mark a dot at the point where these extended rays meet. Label this dot *image.*

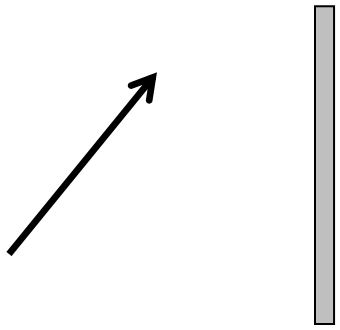
6. On your diagram, measure the shortest distance from the mirror to the object. (This is the *object distance*).

    d. **Record the object distance. _____**

7. Measure the shortest distance from the mirror to the image. (This is the *image distance*).

    e. **Record the image distance. _____**

8. On another piece of paper, draw a line and label it *mirror*. Draw an "angled arrow" in front of the mirror, as shown below. Label this arrow *object*. Look at the mirror to see the image of the arrow.



9. Use the ray box to help explain what you see. Start by finding and drawing incident and reflected rays from the top of the arrow. Then do the same for the bottom of the arrow. When you are finished, your diagram should have ***four incident rays and four reflected rays***. Remove the mirror. Use the technique you learned in step 5 to find points marking the top and bottom of the image.

10. Join the top and bottom of the image, and then label the image.

11. On your diagram from step 8, measure and label the object distance and the image distance.
    f. **Record your measurements**.

12. On the same diagram, measure and label the height of the object and the height of the image.
    g. Record your measurements.

Analyze & Evaluate

1. Refer to your measurements. How does the image distance compare with the object distance?

2. How does the size of the image compare with the size of the object?

3. Describe the attitude of the image compared to the original object.

4. Describe how you use light rays to show where an image in a plane mirror is located.

5. What are the characteristics of the image in a plane mirror? (*hint: SALT*)

S _____ A _____ L _____ T _____

** Staple your mirror work to the back of this sheet.