

Reflection Of Light

Name _____ Date _____ Period ___ Group ___

Introduction: Whenever light hits a surface it can either be absorbed or reflected. If it's reflected, it tends to reflect off at various angles.

Purpose: To discover how light reflects off the surfaces of three different types of mirrors.

Vocabulary Terms to Define

Incident ray: _____

Reflected ray: _____

Angle of incidence: _____

Angle of reflection: _____

Normal: _____

Focal point: _____

Plane Mirror: _____

Convex mirror: _____

Concave mirror: _____

Problem: How will the size of the angle of incidence compare to the size of the reflected angle for a plane mirror.

Hypothesis: In a complete sentence write the hypothesis.

Variables: By the time you finish this experiment , you will need to identify the different types of variables present in this investigation. Consult your notes for definitions of the types of variables.

Independent Variables: _____

Dependent Variables: _____

Controlled Variables: _____

Materials: Pencil, ruler, protractor, light box and accessories

Procedures:

Part 1:

(See sample diagram at right)

1. Steps 2-7 will be done on the back of this page.

2. Place the front edge of the plane mirror so it lines up with the upper edge of the thick line for Trial #1.

3. Allow a single ray of light to fall on the plane mirror and intersect with the normal line and the mirror edge.

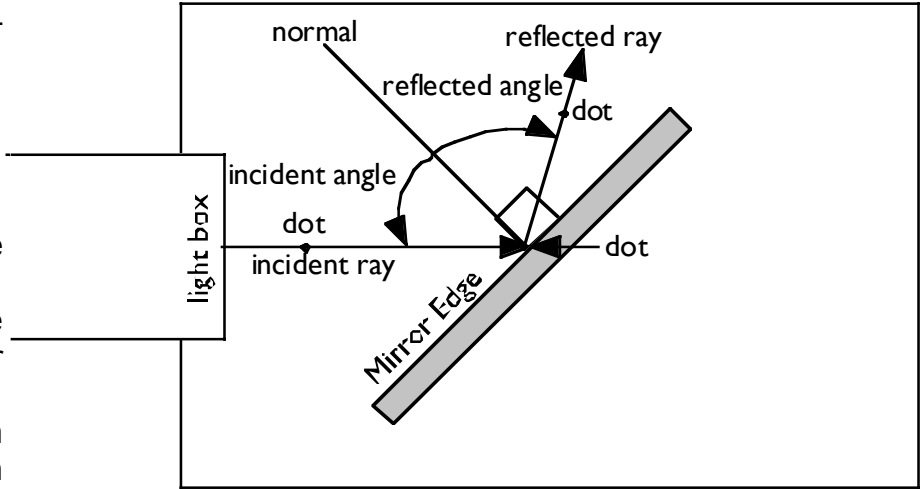
Adjust the position of the light box so you get an **acute** angle between the rays.

4. Hold the mirror absolutely steady. Keep the mirror, paper and light box from moving at all as you do the next step!

5. Place a small pencil dot on the exact center of the incident ray, and a second small pencil dot on the exact center of the reflected ray as shown in the sample diagram. Move the mirror away and simply connect the dots !

6. For Trial #2 , repeat steps 2-5 so you get an **obtuse** angle between the rays .

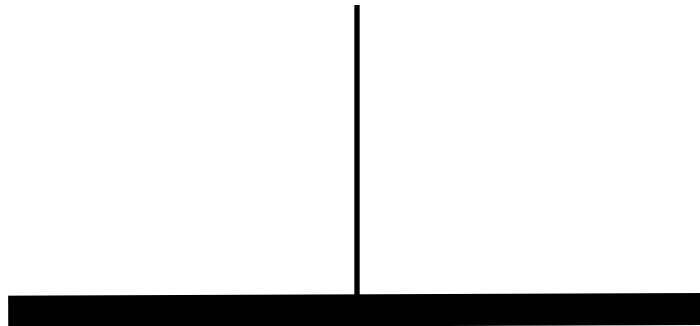
7. Measure the angles of incidence **and** reflection **only**, and record them on the diagram you made as shown in the sample diagram above.



Part 1

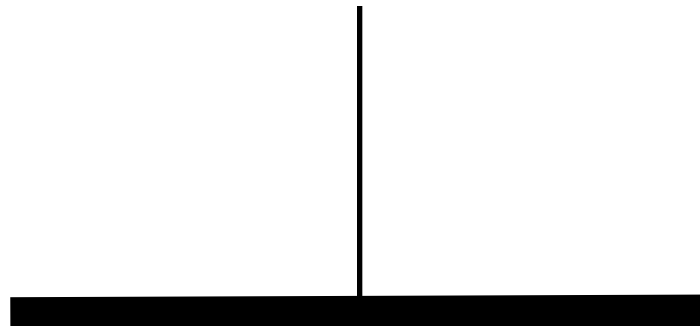
Trial #1 (acute angle between rays)

Place the front edge of the plane mirror so it lines up with the upper edge of the thick line below.



Trial #2 (obtuse angle between rays)

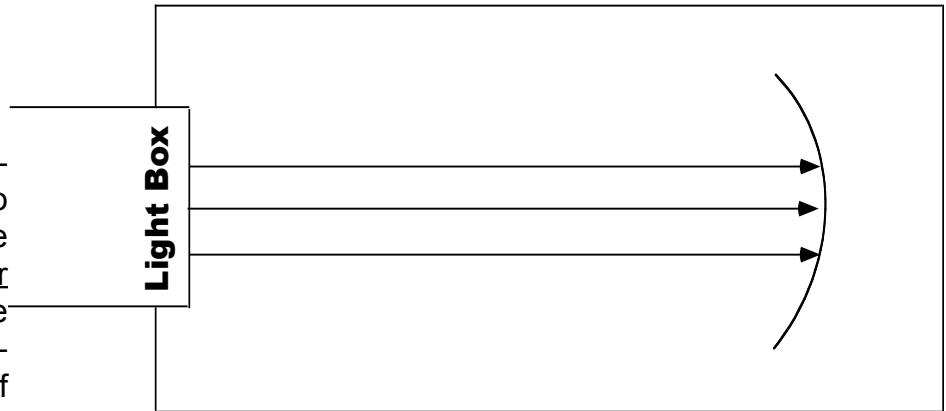
Place the front edge of the plane mirror so it lines up with the upper edge of the thick line below.



Teacher Led Demonstration:

Part 2: (see diagram at right)

1. Allow 3 rays to be reflected directly from a concave mirror, so that the rays converge on the line of the center ray. Make a smaller size drawing in the space at the right that shows the path of the reflected rays. Mark the point of convergence "**F**".



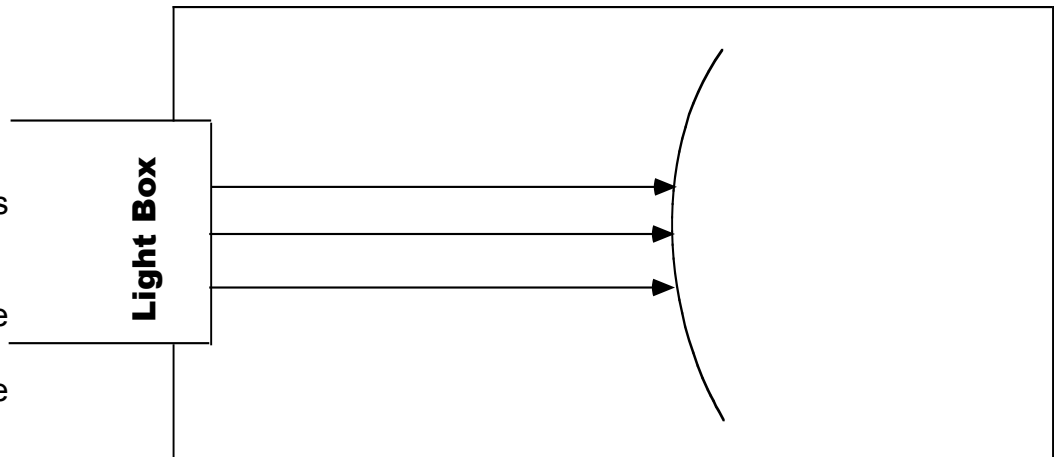
This type of focus point that is located in front of the mirror surface is called a *real focus*, since the rays that converge are the actual light rays.

Question 1. Using your textbook as a possible reference, give three different types of uses for the concave mirror.

Part 3:

(see diagram at right)

1. Allow 3 rays to be reflected directly from a convex mirror so that the center reflected ray l i n e s back up on the center incident ray. Make a smaller size drawing in the space at the right that shows the path of all three of the reflected rays.



2. After removing the mirror, extend the upper and lower reflected rays back to the right until they converge. Mark the point of convergence "**F**".

This type of focus point that is located behind the mirror surface is called a *virtual focus*, since the rays that converge are just extended lines and not the actual light rays.

Question 2. Give two different types of uses for convex mirrors. Again, you might want to use your textbook for some ideas.

Overall Conclusion: State if your original hypothesis was correct or incorrect using specific references from the lab to support your answer.

Sources of Error Identify *two* things that people may have done incorrectly that would have caused them to get totally different answers from the rest of the class. These errors must be unique, in other words they have not been applicable in previous labs. They must be *new* sources of error. Be *specific* about what might have been done.
