

# Reflected Light

**Direction:** Copy down the purpose and background information onto notebook paper before answering all questions in this inquiry. Make sure to put part of the question into your answers.

**Purpose:** How does light ray reflect off a plane mirror?

## Background Information:

*Angle of Reflection* – The angle at which a ray of light reflects off the surface of an object.

*Angle of Incidence* – The angle at which a ray of light strikes the surface of an object.

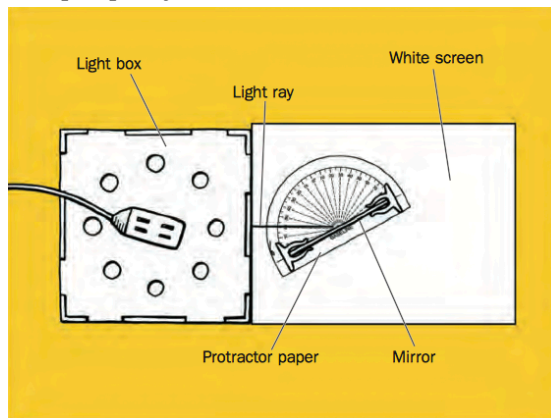
## Introduction:

You have now seen what happens to light as it passes through transparent objects (windows). What happens when light strikes an object that it cannot pass through? In this lesson, you will conduct an inquiry on what happens to light when it strikes a “plane mirror”. You will then apply what you discovered to help you predict and control the direction of a ray of light.

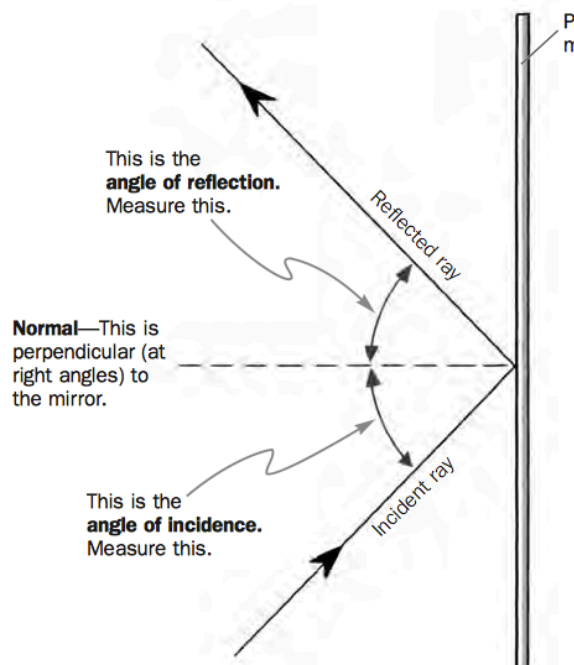
## Procedures:

1. Confirm with your group that your ray box is put together properly.
2. Experiment with placing the large mirror into the path of the ray of light to see what happens to the direction of the light?
3. Record your observations on your sheet of paper.
4. Copy the data table below:

Incidence Angle	Reflected Angle
60°	
40°	
25°	
10°	



5. The base of the large mirror should be placed along the baseline of the protractor (stated as “mirror goes here”).
6. Position the mirror so its center approximately matches the center of the protractor’s baseline. Throughout this inquiry, the mirror should always stay in this position on the protractor paper.
7. Move the mirror and protractor so that the rays of light from the narrow slit pass down the 60° line of the protractor paper. The ray should strike the mirror where the 0° line (the line perpendicular to the mirror – known as “normal”) meets at the center of the baseline (shown in the picture).
8. Circle the “**normal**” line on paper protractor and show your teacher before proceeding.
9. Draw a line (using any colored pencil) from the edge of the 60° mark on the protractor - through the normal line - to the mirror.
10. Label this line as the **incident ray** (incoming wave).



11. Next, line up the ray of light from the ray box with the colored pencil line you drew to the mirror.
12. Notice where the light is being reflected to from off the mirror.
13. Draw a line that follows the center of the ray of light (reflected from the mirror) through whichever number on the protractor from which the light ray travels. This ray is called the **reflected ray** (you will have to draw another straight line).
14. Copy down the number that your reflected ray went through onto your data table.
15. Use a different colored pencil to draw a ray from the 40° line to the normal line on your protractor.
16. Repeat steps 11 – 14 with the 40° angle of incidence and a new student doing the measuring.
17. Use a third colored pencil to draw a ray from the 25° line to the normal line on your protractor.
18. Repeat steps 11 – 14 with the 25° angle of incidence and a new student doing the measuring.
19. Use a fourth-colored pencil to draw a ray from the 10° line to the normal line on your protractor.
20. Repeat steps 11 – 14 a final time with the 10° angle of incidence.
21. Draw a picture on your paper labeling the following: “angle of incidence”, “angle of reflection”, “normal”, “mirror”, and “light source”.

**Analyzing the data:**

1. How did the angle of incidence compare to the angle of reflection in this inquiry?
2. Give an example (using data from this inquiry) to back up your answer to question 1.

**Reading:**

28. Go to the following website read and answer the question on the computer. When you get a 7 out of 7 show your teacher.

<http://www.myschoolhouse.com/courses/0/1/36.asp>