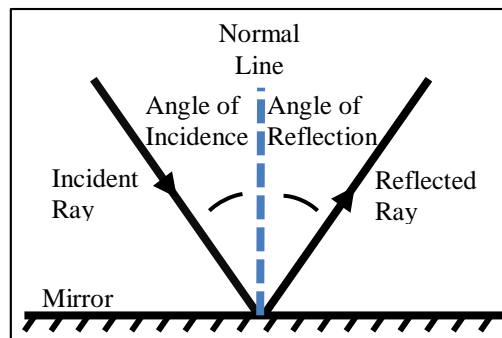


The Law of Reflection

Name: _____

Introduction: When light strikes something, it can either be absorbed (which results in the object getting hotter), it can pass through the object (glass and water for example, which are said to be “transparent”), or it can reflect. Usually, all three occur at the same time, but by different amounts. In this practical task, you will be examining the way light reflects from a flat mirror by directing a single light beam towards it. You will be measuring the angle that the light beam strikes the mirror and the angle at which the light beam reflects.



Aim: To compare the angle of incidence of a light beam with its angle of reflection.
To develop skills in measuring accurately and in the use of a protractor.

Equipment: Hodson Light Box, single-slit plastic, small mirror, pencil, blank paper, protractor, ruler.

Method: To make measurements, you will first need to do some “ray tracing”, which involves accurately recording the path of the light ray on paper.

- Step 1. Draw a line on a blank piece of paper.
- Step 2. Place the back surface of the mirror onto the line (since most of the light reflects from the back surface).
- Step 3. Using the Hodson Light Box, direct a single light ray at an angle towards the mirror. It should look something like Figure 1 below.
- Step 4. Draw two small dots along each light ray. The dots shown in Figure 2 are exaggerated; yours should be smaller.
- Step 5. Remove the light box and the mirror. You should see a line where the back surface of the mirror was and 4 dots, like Figure 3.
- Step 6. Using a ruler, connect the dots with straight lines.
- Step 7. Using a protractor, draw in a normal and measure and record the angle of incidence and the angle of reflection.

Note: since you are measuring the angle between the normal and the light rays, the easiest way to measure the angles is to place the protractor as shown in Figure 4. The line marked 90° on the protractor will be your 0°, and you must count each angle around from the normal line. In Figure 4, the angle of incidence and the angle of reflection are both about 31°.

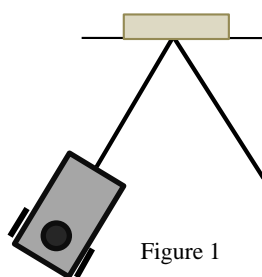


Figure 1

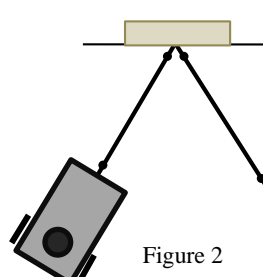


Figure 2

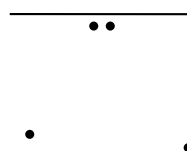
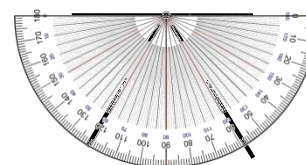


Figure 3



Draw a dot here so that you can then draw a normal.
Figure 4

Draw four separate ray tracings and fill in the table below. Try to vary the angles of incidence as much as possible.

Angle of Incidence	Angle of Reflection

Questions:

1. What do your results show about the Law of Reflection?

2. When you draw the little dots during ray tracing, why is it better to place them as far apart as possible?

3. If you shine a light beam onto a piece of white cardboard instead of a mirror, how and why would your results be different?

You can use the space below to do your ray tracings.