

Name: \_\_\_\_\_ Class: \_\_\_\_\_ Date: \_\_\_\_\_

## Reflection Lab: The Law of reflection

### Learner Outcomes:

- Measure and predict angles of reflection

### Key Terms:

Reflection

Regular reflection

Diffuse reflection

Incident rays

Reflection rays

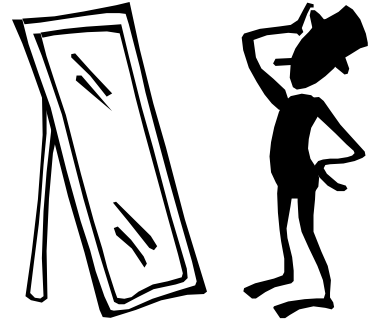
Plane mirrors

Normal

Angle of incidence

Angle of reflection

Law of reflection



**Background Information:** Light travels in straight lines. When it strikes an object, it behaves in different ways depending upon the type of material the object is made of. The rays of light can be transmitted, refracted, reflected or absorbed. In this investigation, we are going to investigate what happens light is reflected.

**Research Question:** What rule can you make to describe how light reflects off a mirror?

### Hypothesis:

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→ your hypothesis should answer the problem above and explain why

### Experimental Design:

Manipulated Variable -

Responding Variable -

Controlled Variables -

### Materials:

Plane mirror

Modeling clay

Ray box with single slit

Protractor

White paper

Ruler

This investigation / activity has been adapted from:

Mah K, Martha J, McClelland L, et al. *Science in Action 9*. Toronto, ON: Addison Wesley.

**Procedure:**

1. Using a ruler, draw a horizontal line on a blank piece of paper. Use a protractor to create a perpendicular line the forms a "T". This is the normal.
2. Using modeling clay, place your mirror upright so that it sits on the horizontal line you have drawn. The normal will be perpendicular to the mirror.
3. Shine the light beam at the mirror so that it is parallel to the normal. Record your observations.
4. Move the light beam so that it hits the mirror at the normal but so that the beam is positioned at an angle.
5. Using your ruler, draw the incident ray and the reflected ray on your paper. Use arrows to show the direction of the light rays.
6. Use your protractor to determine the angle of incidence and the angle of reflection. (Note\* These angles are all measured from the normal).
7. Repeat steps 1- 6 three more times using 4 different angles for the incident ray but always entering the glass at the point of incidence. Use a different colored pencil to draw in the rays for the other angles.

**Observations:**

Title: \_\_\_\_\_

Ray Color	Angle of Incidence	Angle of Reflection
	0 (along the normal)	

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**Analysis:**

1. What happened when the light ray entered the mirror along the normal?
2. What happened when the angle of incidence was increased?
3. How does the angle of incidence compare with the angle of reflection?

**Conclusions:** What generalization can you make about the law of reflection?

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**Extension:**

1. Give an example of a device that might require knowledge of the law of reflection and explain how this knowledge is useful.
2. Investigate, describe and explain one other optical illusion caused by reflection.

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