

# Can You Change the Direction of Light?

Estimated Time:

**Prep:** 10 min.

**Activity:** 20 min.

## Introduction

### Overview

**Experiment:** Students use mirrors to direct a **beam** of light.

**Key Concepts:** Students will investigate properties of light, understanding that light moves in straight lines that can be redirected.

### Lead-In

Introduce the concept of light by explaining that light is what makes it possible for us to see. Light **reflects** off objects around us and enters our eyes, which send signals to our brain. (We can't see in the dark because there is no light being reflected off the objects around us.) Explain that light moves in straight lines, and when it hits an object, its path is redirected.

Demonstrate with a small rubber ball and a tray or box lid. Roll the ball in a straight line from one end to the other. Explain that this represents light moving in a straight line. Now roll the ball at an **angle** so that it hits the side of the tray and bounces in another direction. Explain that when a beam of light hits an object, it is reflected and redirected just like the ball. Roll the ball at a sharper angle so that it bounces back and forth between the walls before hitting the opposite side. Explain that light can be redirected many times as it bounces off various objects at different angles.

## Teacher Preparation

### Lead-In Materials:

- Rubber ball\*
- Tray or box lid

### Try This! Materials:

- Translucent film in two different colors

### Prepare:

- Make copies of the Experiment Sheet.

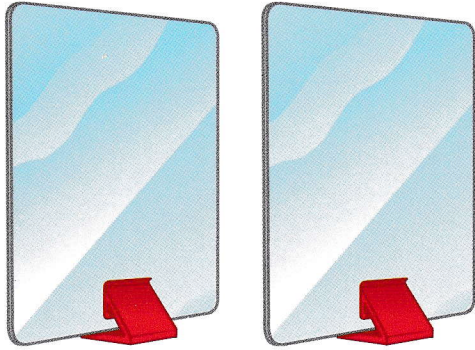
**Note:** For best results, have students do the experiment in a dark room.

*\*included in kit*

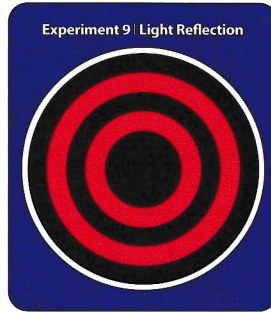
## Vocabulary

- ◆ **angle** the space or shape formed where two lines or surfaces meet
- ◆ **beam** a line of light coming from a source (such as the sun or a headlight)
- ◆ **light** a bright form of energy that travels through space
- ◆ **reflect** to throw back light, sound, or heat that hits a surface

## You Will Need



2 mirrors with plastic stands



target card




flashlight

Experiment 9 | Light Reflection

Name \_\_\_\_\_

Can You Change the Direction of Light?

Draw where you set up the mirrors and flashlight.  
Draw what the light looked like.



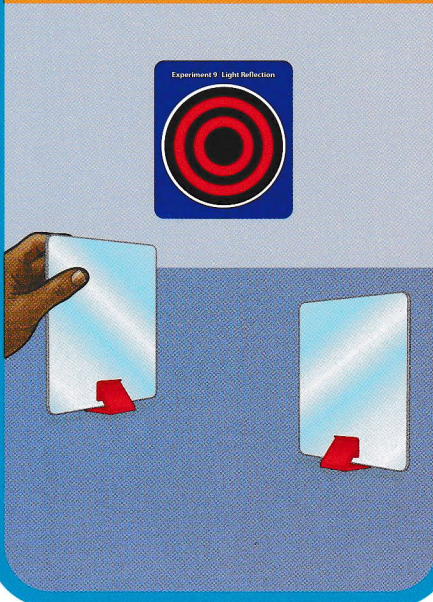
I conclude that I can change the direction of light by \_\_\_\_\_

Experiment Sheet

## Procedure

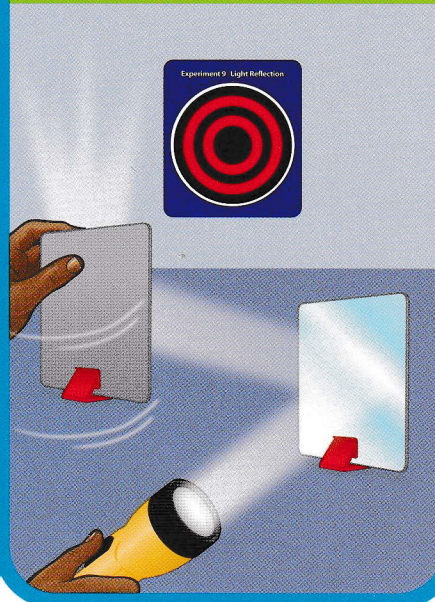
1

Tape the target card to a wall.  
Have the mirrors face each other at a slight angle.



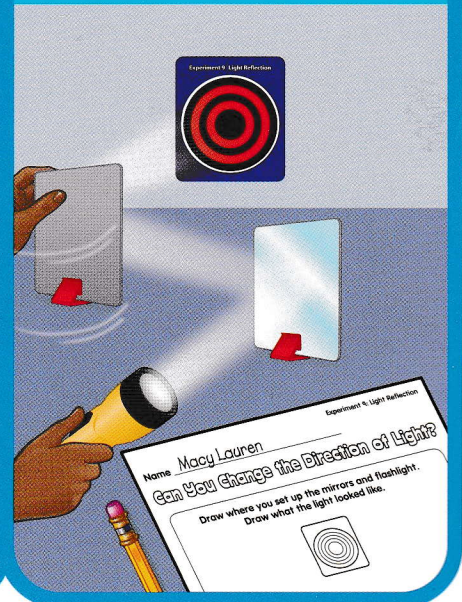
2

Aim the flashlight at the first mirror. Try to make the light move from one mirror to the other and then to the target.



3

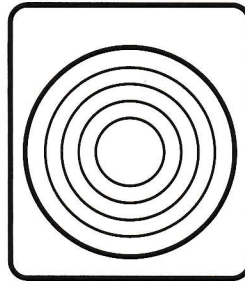
Move the mirrors and flashlight until the light hits the target.  
Record your results.



Name \_\_\_\_\_

# Can You Change the Direction of Light?

Draw where you set up the mirrors and flashlight.  
Draw what the light looked like.

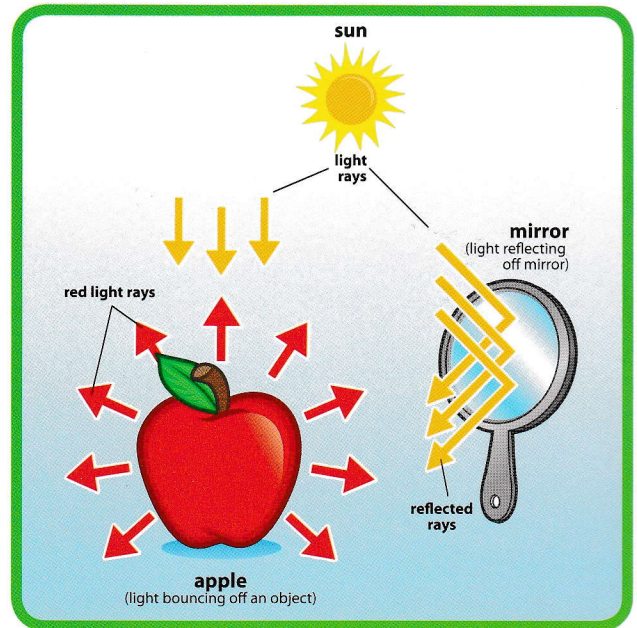


I conclude that I can change the direction of light by \_\_\_\_\_



## Why?

Most objects absorb some of the light waves that strike them and reflect others. (The wavelength of the reflected light waves determines what color your eye will see.) The smooth, silver surface of a mirror reflects almost all light waves without scattering them, creating a clear image. Light waves that strike the mirror at an angle are reflected at the same angle, producing an exact image.



## Discussion Prompts & Questions

- What does the light do? In what direction is it traveling?
- What happens if you move one mirror? What happens if you move both?
- What happens if you aim the flashlight more to one side? What if you aim it more up or down?
- How can you make the light hit both mirrors and the target?



## Sentence Frames

- When I \_\_\_\_\_, I saw \_\_\_\_\_.
- It was hard to \_\_\_\_\_.
- After I \_\_\_\_\_, I found out that \_\_\_\_\_.



## Try This!

Cover one of the mirrors with clear yellow film, and cover the other mirror with clear blue film (or use other colors you may have). Have children light up the target using the flashlight and only one of the mirrors. What color do you see? Try it again using only the second mirror. Then light up the target using both mirrors. Now what color do you see?