What Is Light?

1. Make copies of Student Resource 1.1, Vocabulary, and distribute to students. Discuss the definitions with students as they come up throughout the section.

2. Ask: **What is light?** *(a form of energy)* Explain that light is just one form of energy. Ask: **What do you think of when you hear the word “energy”?** *(Students might suggest electricity or possibly heat energy.)*

3. Ask: **Where does light come from?** *(Students might suggest from the Sun or from a light bulb.)* Illustrate that light energy can also come from artificial sources by turning on and off a flashlight.

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### Vocabulary

**energy** the ability to do work
- Light is a form of energy. Energy can be converted from one form to another. For example, light energy can be converted to electrical energy in a solar calculator. Or, electrical energy can be converted to light energy in a flashlight.

**light** a form of energy that travels in waves and can move through empty space
- Light travels in straight lines. It can reflect off of surfaces. We can see light when it enters our eyes. The light that we see is called visible light. Some kinds of light, like ultraviolet light and radio waves, cannot be seen without special equipment.

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**Reflect** to bounce back from a surface
- We can see things because light reflects off of them and travels to our eyes. Some objects reflect light better than others.

### Seeing Objects

**10 minutes**  
**Pairs**

#### Objectives
- Students recognize that light is reflected from objects.
- Students recognize that we see an object when light traveling from the object enters our eyes.

#### Materials

* For each pair
  * shoe box with small brightly colored object *(marble or crayon)*

*Not provided in kit*

#### In Advance
Place one small, brightly colored object in each shoe box.
1. Students try to observe objects in the dark. Distribute a shoe box to each pair of students. Have students tilt the box so that the object is in a far corner and then barely open the box lid (about 1 cm). Ask: Can you see the object? (no)

2. Students note when they see shape. Have students continue to open the box slowly until they can see just the object’s shape. Ask: When can you see the shape of the object? (when light hits it) Explain that light reflects off objects and enters our eyes. That’s how we see objects.

3. Students note when they see color. Have students continue to open the box slowly until they can see the object’s color. Ask: When can you see the color of the object? (when more light hits it) Explain that we need more light to see color than to make out shape, so we see an object’s shape before we see its color.

4. Discuss how light travels in straight lines. Ask: Can you see an object that is in front of you? (yes) Can you see an object that is behind you? (no) Can you see an object that is at your side? (sometimes) Explain that light travels in straight lines. We see light when it reflects off of an object and travels in a straight line from the object to our eyes.

Assessment

Explain that the Sun produces light. The Moon does not produce its own light, but it looks lit up in the night sky. Ask: Why can we see the Moon? (Light from the Sun hits the Moon, reflects off, and travels to our eye.)
How Does Light Travel?

10 minutes

Teacher Demonstration

Objectives
• Students recognize that light travels in straight lines.
• Students observe that light is reflected from mirrors.

Materials
For the teacher
2 *blackboard erasers
full of chalk
1 flashlight with batteries
1 mirror, plastic

*Not provided in kit

In Advance
Remove the protective plastic sheet from the mirror.

1. Project the light onto a surface.
Darken the room. Shine a flashlight at a wall or a projector screen across the room. Ask: Where do you see the light? (only on the wall or screen)

2. Demonstrate that light travels in straight lines.
Have a student hit two erasers together while you shine a flashlight through chalk dust at different angles toward the screen. Point out that the light travels in straight lines.

3. Explain and demonstrate reflection.
Explain that when light hits some surfaces it is reflected. Review with students the definition of the word reflect. Show them the mirror and explain that mirrors reflect light. Shine the flashlight on the mirror. Point out that when the light hits the mirror, it is reflected off the mirror in a straight line. Students should note that when the room is dark you can see the straight lines of the light because the chalk dust reflects it.

Teaching Tip
Step 1: If you do not have a dark enough room, do this activity when you visit the school library with your class or go to another room that can be darkened. Preserve batteries by removing them from flashlights when they are not in use for long periods of time.

Assessment
Explain that when you roll a ball towards a wall, the ball bounces back from the wall in a straight line. Ask: What happens when you shine light on a mirror? (The light is reflected, or bounces, off the mirror in a straight line.)