Properties of Light

Vocabulary
energy the ability to do work
light a form of energy that travels in waves and can move through empty space
reflect to bounce back from a surface

Concepts and Skills
• Students know that light travels in straight lines.
• Students know that light is reflected from mirrors and other surfaces.
• Students know that an object is seen when light traveling from the object enters the eye.
• Students collect data in an investigation and analyze those data to develop a logical conclusion.
• Students predict the outcome of a simple investigation and compare the result with the prediction.

Planning
Materials
• aluminum foil
• batteries, D-cell
• *blackboard erasers
• construction paper, black
• flashlights
• metal spoons
• mirrors, plastic
• *objects, brightly colored (marbles or crayons)
• plastic sandwich bags
• *shoe boxes
• waxed paper
• *white paper

Student Resources
• 1.1 Vocabulary
• 1.2 Comparing Reflectors
• 1.3 Section 1 Assessment

In Advance
• For Share with Your Students (p. 4), put the batteries in the flashlight.
• For Investigate 1 (p. 4), collect one shoe box for each pair of students. Small boxes like bank check boxes or big crayon boxes with lids can also be used.
Science Background

Light is a form of energy that you can see when it interacts with matter. Light travels in waves, which carry energy. Light waves travel in straight lines in all directions from a light source. You probably have seen waves in water. If you drop a pebble in the water, waves spread out in all directions. Waves of light spread out from a light source in a similar way. However, unlike waves of water, light waves do not need water or even air in order to travel. They can travel through empty space. For example, light from the Sun travels millions of kilometers through space to reach Earth.

When light waves hit an object, the waves can behave in four different ways. They can be reflected, transmitted, refracted, or absorbed. How the light waves behave depends on the properties of the object. Reflection occurs when light waves bounce off a surface. When we see an object, we are actually seeing light that the object reflects. For example, you can see this page because it reflects some light into your eyes. Most surfaces reflect at least some of the light that hits them. Surfaces that are very smooth reflect light rays at the same angle they strike the surfaces. This makes the surfaces look shiny. Surfaces that are rough reflect the light rays at many different angles. This makes the surfaces look dull.