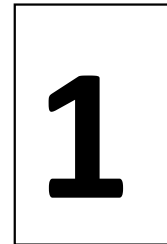


## FIRST GRADE LIGHT – REFLECTION AND REFRACTION

### OBJECTIVES:

- Comparing reflect and refract.
- Discovering how light moves



### VOCABULARY:

- lens
- reflect
- refract

### MATERIALS:

- 15 Bags (calcite, ulexite, quartz, and an index card with lines)
- Bag with 2 mirrors
- prism
- lens
- [Light Magic by J. Blueford](#)

### BACKGROUND:

Physics helps us explain the world around us. There are many things occurring in the world that we can't explain. This unit has students investigating the properties of light. They will not understand the physics of light, but will begin the process of becoming familiar with some of the bizarre things light can and cannot do.

The world is full of images for children. A reflection in a mirror or window can scare them; a penny in a pool may look closer than it really is. Light has always played with our sense of sight. Children can learn how these images are different from the real thing. Children need to discover that they can change the way light moves. As children play with optic toys, they begin to see that light can play tricks with their eyes.

Young children need to experience different examples of reflect and refract to recognize them easily. Reflect is easier to understand than refract. Reflection is just a "bouncing" back of an image, while refraction is a change of direction of an image. A prism, for example refracts or bends light to create a rainbow. However, with just a little guidance, students can look at light and identify whether it refracts or reflects

Light can be controlled by lenses, prisms, and mirrors. **Light moves.** Lenses are important in our everyday life. Many people wake up putting on eyeglasses or contacts. People who take pictures use lenses in the cameras. Lenses are in magnifiers, lighthouses, microscopes, telescopes, binoculars and projectors.

Nature has found a natural way to create a lens system in most organisms (eyes) so they can see. The word lens comes from the Latin word "lentil," (a bean used in soup that is biconvex.)

A prism causes light to change direction or **refract** as it moves through the prism. Light when it travels through different substances can also refract. It appears to our eyes as if the object is bending, but it is only "light" playing tricks with our eyes. A mirror allows light to "bounce" or **reflect** from the surface of the mirror. We see ourselves in the mirror because light reflects or bounces from the mirror and the image is captured by lenses in our eyes. Light can also **diffract** when it goes through a small slit. The light particles spread from the center into distinct packages. Depending on your class we usually do not expect the students to learn this term, but saying the term is allowed.

Many people do not realize that light is actually a real phenomenon. It moves, it changes directions, and it is part of a branch of physics called the electromagnetic wave spectrum.

### **PROCEDURE:**

In this lab, students will "play" with light. Students will view several examples of reflection and refraction and will try to discover how light moves.

1. Read Light Magic
2. Go over objects that reflect and refract. Common objects include mirrors (reflect); glass of water with spoon in it (refract); foil (reflect); oil in a glass bottle (refract); prism (refract); glass (refract); lens (refract); or any shiny surface (reflect).
3. Give each student a mirror in pairs. Have them play with reflect. Have them work with a partner and have them put the two mirrors opposite and see if children can see infinity reflect. Make sure they put something in the center.
4. Then give two students a bag of quartz, ulexite, and calcite. Have them discuss how the mineral refracts the line.

**Next Generation Science Standards** 1 Physical Sciences  
Waves Light and Sound  
1 PS 4-2 Evidence based account that objects are illuminated.

PS4.B, 1-PS4-3: PS4.B