



TEACHER INFO

LIGHT AND REFLECTION GRADES 3-5

COMMON MISCONCEPTIONS

- **Light does not travel from a source to an object.**
Students may not realize that when an object is lit by the sun or a lamp, it is because light is traveling from the source to the object. The amount of light reaching the object depends on its distance from the source—objects farther away appear dimmer.
- **Light does not need to enter the eye in order for an object to be seen.**
Some students believe we can see objects just because they are present, without realizing that light must reflect off the object and enter our eyes. This explains why we cannot see anything in a completely dark room—without light, no visual information reaches the eye.
- **Light needed to see an object is coming from the eye rather than to the eye. Our eyes produce light so we can see things.**
Students may think vision works like a flashlight shining from the eyes. In reality, our eyes do not make light—they receive it. We can only see objects when light from a source (like the sun or a lamp) reflects off those objects and travels to our eyes.
- **Only shiny objects reflect light.**
While shiny objects reflect light more clearly and brightly, all visible objects reflect some light. If they didn't reflect any light at all, we wouldn't be able to see them.
- **Black does not reflect any light.**
Black objects reflect less light than lighter-colored objects, but they still reflect some. That's why we can see black objects—they reflect just enough light for our eyes to detect them.
- **Light goes around things and does not travel in a straight line.**
Students may not realize that light travels in straight lines. Shadows occur because an object blocks the straight path of light. Light does not bend around corners unless it is reflected or refracted.

LIGHT AND REFLECTION AT THE ELEMENTARY LEVEL

Light, at the elementary level, is not meant to be introduced in great depth. Instead, the concept of light is introduced



in conjunction with reflection in the context of vision—something relevant to students at this age. Students do start to learn about waves (wavelength, amplitude) at this level, but in the mechanical sense (4-PS4-1). Students are gaining the foundational knowledge they will need later to understand electromagnetic waves.

At the elementary level, we do discuss that light travels from a source to an object, and that it is reflected off objects in order for them to be seen by our eyes. However, method of travel is not specified. Students should be comfortable with the idea that light is produced by a source. Sources of light might include the sun, or lamps. The light from these sources travels in a straight line. It doesn't bend, but can be reflected off the surface of objects. It is this reflected light that allows us to see objects—our eyes don't produce light and neither do the objects (with the exception of luminous objects). Anything that is visible regardless of color or reflectivity is reflecting light, or it would not be able to be seen. However, some surfaces and colors do reflect better than others. For example, white reflects better than black, and shiny reflects better than matte.

VISION

Again, at the elementary level, vision is used in conjunction with light and reflection to create a relevant context for a basic understanding of both light and vision. The biology of vision is not addressed in depth. It is enough for students to understand that light is critically necessary to be able to see an object (no light, no sight) and that the structure of their eyes produces inverted reflections, but their eyes work with their brain to translate into the upright images they see.

CDS, DVDS, AND BLU-RAYS

Music and movie entertainment come to us courtesy of light and reflection. CDs, DVDs and Blu-Ray discs are covered with tiny patterns of grooves that store information. When you play one of these discs, lasers in your CD, DVD or Blue Ray player read those grooves by reflecting the laser beam. This information is decoded as the music you hear or the movie you watch.

