

Equitable Access to Content

Amplify CKLA increases literacy and background knowledge across subject areas with informational and literary texts organized coherently to build students' reading, writing, listening and speaking skills. Each text, whether a Student Reader or a Read-Aloud, includes explicit instructions in the Teacher Guide for facilitating interactive and guided experiences with text.

Grade 3 Unit 5: Light and Sound

Unit 5 *Light and Sound* features both informational and narrative texts that focus on the science behind light and sound. The Student Reader, *Adventures in Light and Sound*, is informational and includes chapters on light sources, shadows, mirrors, reflection, refraction, color, etc. as well as characteristics of sound, including the human voice. Inventors Alexander Graham Bell and Thomas Edison are profiled in two biographies that will become sources for a multi-day research project. The Read-Aloud is a fictional story about two old friends, one an artist and the other a musician, who in their advancing age are experiencing difficulties with seeing and hearing, respectively. Each character shares their experiences and information about light and sound with two grandchildren. The Reader and Read-Aloud texts support and complement each other on the topics of light and sound.

Chapter
2 **How Are
Shadows Made?**

Do you remember any interesting facts about how light travels? In the last chapter, you learned that it travels in waves that can be measured as wavelengths. You also learned that it travels at a very high rate of speed. Here's another interesting fact—light waves travel from a source in straight lines that spread out in all directions, like rays.

Take a look at the image on the opposite page. In this image, there are several light sources. Each source or dot of light has several rays of light shooting out. Put your finger on the source you can see. Now, using your finger, trace the lines of light coming out from that source. Each ray of light is a straight line.



Light travels in straight lines like rays from its source.

Student
Reader

Teacher Guide: Reading

In this lesson, students will read to themselves and answer guiding questions. They will also do a hands-on group experiment with flashlights to reinforce what they learned about how the distance of the object from a light affect the size of a shadow and share their observations with the whole group.

Lesson 3: How Are Shadows Made?

Writing



Primary Focus: Students will take notes and record observations about cause and effect from an experiment about light and different surfaces and write a reflection.

EXPERIMENT REFLECTION (10 MIN.)

- When the experiment is completed, students will work on the Reflection on Activity Page 3.2 independently.

Lesson 3: How Are Shadows Made?

Reading



Primary Focus: Students will demonstrate understanding of cause and effect after reading informational text about how light makes shadows.

INTRODUCING THE CHAPTER (10 MIN.)

- Review with students what they learned in the previous chapter by referring to Activity Page 1.2 Lab Notes.
- Using the graphic organizer, remind students that light is a form of energy.
- Sources of light include the sun, the stars, light bulbs, candles, and flashlights. (Students may also have included fireflies, fires, and other sources that they learned about during Listening and Learning Read-Alouds.)
- One way that light travels is in waves.
- Light travels 186,000 miles per second in a vacuum.
- Remind students that in an earlier Listening and Learning lesson in this unit, they heard Jack and Samuel talk about shadows.
- Ask students to spend a few moments recalling what Jack and Samuel said about shadows.
 - » A shadow is the area of darkness that is produced by an object or person that is blocking the light. Light cannot bend around the object or person because it travels in straight lines.

Activity Page 3.2, Part B



Writing Exchanging Information and Ideas

Entering/Emerging

Provide a picture of a car. Point to various parts and ask students if the light will go through, bounce off, or stop.

Transitioning/Expanding

Provide a picture of a car and ask students to label the parts (window, metal, plastic, etc.). Have students list next to the car part whether the light will bounce, go through, or stop.

Bridging

Encourage students to use domain vocabulary and write in complete sentences.

Activity Page 1.2



Teacher Guide: Read-Aloud

In this lesson, students continue to hear the story of the two old friends and learn more about how light moves and passes through certain materials but cannot pass through others, creating shadows.

Jack sat shaking his head and then took a sip of the refreshingly cool lemonade. "That is a lot to think about!" he admitted.

"It sure is," agreed Samuel, smiling. "Scientists are still studying and learning many new things about light, including that in special situations, light can act like a stream instead of a wave." Jack shook his head. "Figuring out how light works must be complicated, but it is indeed fascinating."

- Show Image Card C.U5.L2.1. Tell students you can see the rays of light in this image because they are shining on bits of dust and moisture in the air. Ask if students have seen rays of the sun like these. When is the best time to see them?
 - » at sunrise or sunset, or when it is partly cloudy



Show Image U5.L2.4:
Alfie chasing a bee; light waves passing through pitcher of lemonade

Samuel nodded. "Light from the sun reaches Earth because it can pass so quickly through outer space.

There is almost nothing to block its path. Once light reaches Earth's atmosphere, it slows down a little bit."

Why is there almost nothing to block the path of the light? (Space is a vacuum.)

"The atmosphere is like a blanket of air full of gases and moisture that covers the Earth. This blanket of air slows the light down."

Point to the lemonade and the oak tree as you read the sentences aloud. Point to the shadow in the image.

"Then," Samuel continued, "the speed of light slows down even more because objects start getting in the way of the light rays." Samuel pointed to the lemonade. "For example, rays of light waves move more slowly when traveling through liquids, such as this lemonade." Then Samuel pointed to the oak tree. "Light waves cannot pass through

Image Card
C.U5.L2.1

Rays of Sunlight

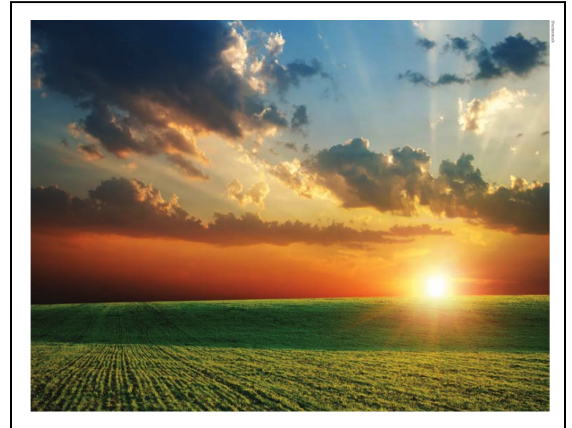


Image Card