



## **Science Exemplary Text Student Handout**

A hungry falcon soars high above Earth. Its sharp eyes scan the ground. Suddenly, it spies something moving in the grass. The falcon dives toward it.

Far below, a gray field mouse scurries through the grass. Its dark, beady eyes search constantly for danger. With eyes on either side of its head, the mouse can see almost everything around it.

Will the mouse see the falcon in time to escape? Or, will the speedy falcon catch the prey it spied from far above? Whatever happens, one thing is clear: Without eyes, neither animal has a good chance.

Why? Eyes help many animals make sense of the world around them - and survive. Eyes can guide the falcon to dinner or help the mouse see a perfect place to hide.

Animal eyes come in many different shapes, sizes, colors, and even numbers. Yet they do the same job. They all catch light. With help from the brain, eyes turn light into sight.

Eyes work in the same way for people. Look at this page. You may think you see words and pictures. Believe it or not, you don't. All you see is light bouncing off the page. How is this possible? The secret is in the rules of light.

### **Light Rules**

Light is a form of energy, like heat or sound. It can come from a natural source, like the sun, or artificial sources, like a lamp or a flashlight.

Light is the fastest known thing. It travels in waves and in nearly straight lines. In air, it can speed 299,700 kilometers (186,200 miles) per second. It can race from the sun to Earth in just over eight minutes! Light doesn't always travel so fast. For example, water or glass can slow light down, but just a bit.

Light may seem to break all driving speed laws. Yet there are certain rules it always follows. Light reflects, or bounces off objects. It also refracts, or bends. And it can be absorbed, or soaked up, by objects. These rules of light affect what, and how, we see.

This is an example of exemplary text found in *Common Core Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects: Appendix B Text Exemplars and Sample Performance Tasks*. Retrieved from [http://www.corestandards.org/assets/Appendix\\_B.pdf](http://www.corestandards.org/assets/Appendix_B.pdf)



## **Light! Eyes!**

Imagine this scene: You're at your desk happily reading Explorer magazine. Light from your desk lamp scatters in all directions.

Light hits the page. Some bounces off the page, or reflects. It changes direction. It's a little like how sound bounces off a wall. Now some of this reflected light is traveling right toward your face. Don't duck! For you to see Explorer, some of this light has to enter your eyes. Objects become visible when light bounces off them.

Your eyes are light catchers. Yet it takes more than catching light to see an image. Your eyes also have to bend light. Here's how.

First, light hits your cornea. That's the clear covering on the front of your eyeball. The cornea refracts, or bends, light.

## **And Action!**

Is your cornea super strong? No! Think about how light travels more slowly through water. The same thing happens in your cornea. As light passes through the cornea, it slows down. That makes the light change direction, or bend.

Next, light enters your pupil, the dark center part of your eye. It passes through your lens. The lens bends light, too. What's the big deal about bending light? That's how your eyes focus, or aim the light to make a clear image.

The image appears on your retina at the back of your eyeball. It's like a movie. Playing Today at a Theater in Your Eye: Explorer magazine! There's only one problem. The image is upside down. Luckily, your brain flips the image right side up. That's pretty smart!

Hall, Leslie. (2009). "Seeing Eye to Eye." *National Geographic Explorer*. September 2009.

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## Science Exemplary Text Teacher Resource

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### Light Rules

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*Teacher introduces the text with minimal commentary and students read it independently. Teacher then reads passage aloud. Give a brief definition to words students would likely not be able to define from context (underlined in text). Teacher guides the students through a series of text-dependent questions. Complete the performance task as a cumulative evaluation of the close-reading.*

### Text-Dependent Questions

1. What are we really seeing when we look at something?
2. What are some of the things the author describes eyes doing? Why does she include these examples?
3. Light travels fast but things can slow it down. What does this?
4. Explain the process the light goes through when hitting your eye.
5. What is the problem when light hits your retina?
6. In the fifth paragraph the author states, "With help from your brain, eyes turn light into sight." List evidence from the text that support this statement.
7. The author says, "The secret is in the rules of light." How does this statement relate to the information in the section "Light Rules"?
8. In the section "Light Rules," the author states that light can come from a natural or an artificial source. What is the meaning of the word *natural*? What is the meaning of the word *artificial* in the text?

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9. What are the rules of light? Why does the author include them in the text? Explain why light is needed to see an image.
10. Why does your eye need to bend light?
11. Describe how the image that appears in your eye is like a movie.
12. After reading Leslie Hall's "Seeing Eye to Eye," explain the process of how the eye uses light to capture an image in your brain. Describe how light enters the eye and how the eye uses light to create an image. Include evidence and examples from the text to explain the process.

## Performance Tasks for Informational Texts

Students quote accurately and explicitly from Leslie Hall's "Seeing Eye to Eye" to explain statements they make and ideas they infer regarding sight and light. [RI.5.1]

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