

## *The Eye: Structure and Function: Teacher's Guide*

**Grade Level:** 6-8

**Curriculum Focus:** Life Science

**Lesson Duration:** Two or three class periods

### **Program Description**

It is a window to our emotions, and some say, to the soul. Explore the complexities of the human eye. Learn how its delicate mechanisms—eyelids, lashes, cornea, pupil, iris, and even tears—help us perceive the world.

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### **Onscreen Questions**

Before watching the video

- What do you know about the structure and function of the eye? As you watch the program, think about how the eye perceives the shape, color, distance, and size of an object.
- Watch for examples of how the eye interacts with other body systems.

After watching the video

- Describe how the eye transmits an image to the brain. How does the eye depend on other body systems?
  - Compare the process of vision to a camera. How are they similar and different?
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### **Lesson Plan**

#### *Student Objectives*

- Research the diversity of eyes online and in library materials.
- Report on and illustrate the eyes of animals.
- Choose, write a description of, and illustrate an eye for the class to identify.

#### *Materials*

- Computer with Internet access
- Writing paper, drawing paper, and poster paper
- Pens, markers

- Scissors
- Glue

## Procedures

1. Review with students what they learned about the human eye, including its structure (e.g. such parts as the cornea, pupil, and retina), how the eye protects and cares for itself, and how it receives visual images.
2. Tell students that, having learned about the workings of the human eye, they will explore the diversity of eyes in the animal kingdom. Students will contribute to a group report and present individually a quiz on this subject.
3. Direct students' attention to two Web sites:
  - <http://www.newton.dep.anl.gov/natbltn/natbltn.htm>
  - <http://www.ebiomedia.com/gall/eyes/eye1.html>

Tell students they will give group reports to the class based on the Eyes of Animals essay at the first Web site. They will use the second Web site to explore the diversity of eyes and get ideas for further individual research in the library.

4. Divide the class into five groups. Have them go to the following Web site: <http://www.newton.dep.anl.gov/natbltn/natbltn>. It features Nature Bulletins from the Forest Preserve District of Cook County (Illinois). Scroll down to number 403, Eyes of Animals. Print out copies of the essay and distribute them to each group. Assign each group a paragraph. Instruct the groups to read their paragraphs carefully. Then have them cut out their paragraph and glue it onto the center of a piece of poster paper. Tell them to decorate the area around their paragraph with illustrations of the animals and behaviors cited in the paragraph.
5. When the groups have finished illustrating their paragraphs, have them read the paragraphs to the class (in the order in which they appeared in the essay) and hold up their illustrated posters. (Students may find it easier to read from a printed copy of the Web site's essay rather than from the paragraph on the poster.)
6. If possible, post the illustrated paragraphs in order on a bulletin board titled "The Eyes of Animals."
7. Now tell students that they are going to do individual research and write a paragraph on the eye of an animal of their choosing. Give them time to browse the Web site <http://www.ebiomedia.com/gall/eyes/eye1>. Encourage them to check out the "Eye, Eye, Eye, Eye" gallery and the link to "Whose Eye Is It Anyway". They may want to browse through the questions and answers at the bottom of the page and explore such links as the Eye to Eye Annotated Web Link Set (AWLS).
8. Once students have picked an eye they want to "look into," tell them to research the eye and the animal it belongs to through AWLS (see Step #7) and in library materials. Tell students they must write a paragraph about the eye. They will then read their paragraphs to the class to see if the other students can guess which animal's eye is being described. Advise students to include in their paragraphs such information as how the animal lives, how the eye serves the animal's particular lifestyle, and any special properties or characteristics of this eye.

9. Have students illustrate their paragraphs with a drawing, or, if available, a photograph of their animal's eye from a magazine or newspaper from home.
10. Have students read their paragraphs and show their illustrations to the class and see if the rest of the class can guess which animal's eye is described. If there is room in the classroom, post the students' illustrated paragraphs on a special Eye Chart or Eye Gallery bulletin board.

## Assessment

Use the following three-point rubric to evaluate students' work during this lesson.

- **3 points:** Students demonstrated proficiency in using the Internet as a research tool; worked cooperatively in their groups to present a report on their paragraph of the essay on animal eyes; researched and wrote thorough quiz paragraphs on an eye of their choice.
- **2 points:** Students demonstrated an understanding of how to use the Internet as a research tool; worked cooperatively in their groups to present a report on their paragraph of the essay on animal eyes; researched and wrote on-grade quiz paragraphs on an eye of their choice.
- **1 point:** Students demonstrated little skill or interest in using the Internet as a research tool; had trouble working cooperatively in their groups to present a report on their paragraph of the essay on animal eyes; had difficulty researching and writing a quiz paragraph on an eye of their choice.

## Vocabulary

### pupil

*Definition:* The circular opening in the center of the pigmented iris of the eye, through which light passes to the retina

*Context:* Our pupils tend to contract in bright light and dilate in the dark.

### reflection

*Definition:* The phenomenon of light or sound waves being thrown back from a surface; the act of reflecting, or turning or sending back

*Context:* As Shakespeare wrote, "The eye sees not itself, But by reflection...."

### retina

*Definition:* The light-sensitive membrane that lines the back wall of the eyeball and is composed of several layers, including one containing the rods and cones

*Context:* The retina receives an image formed by the lens and converts it into chemical and nervous signals that reach the brain by way of the optic nerve.

**rods and cones**

*Definition:* The elongated cells or elements of the sensory layer of the retina, some of which are cylindrical, others somewhat conical

*Context:* The structure of rods and cones in the eyes of owls gives these nocturnal birds of prey excellent night vision.

**Academic Standards****National Academy of Sciences**

The National Academy of Sciences provides guidelines for teaching science in grades K–12 to promote scientific literacy. To view the standards, visit this Web site:

<http://books.nap.edu/html/nses/html/overview.html#content>.

This lesson plan addresses the following science standards:

- Life Science: Structure and function in living systems

**Mid-continent Research for Education and Learning (McREL)**

McREL's Content Knowledge: A Compendium of Standards and Benchmarks for K-12 Education addresses 14 content areas. To view the standards and benchmarks, visit link:

<http://www.mcrel.org/compendium/browse.asp>

This lesson plan addresses the following national standards:

- Science – Life Sciences: Understands the structure and function of cells and organisms, Understands biological evolution and the diversity of life
  - Language Arts – Writing: Uses the general skills and strategies of the writing process, Gathers and uses information for research purposes
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**Support Materials**

Develop custom worksheets, educational puzzles, online quizzes, and more with the free teaching tools offered on the Discoveryschool.com Web site. Create and print support materials, or save them to a Custom Classroom account for future use. To learn more, visit

- <http://school.discovery.com/teachingtools/teachingtools.html>