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UC PEER REVIEWED

Publication 8339 / March 2009

YOUTH DEVELOPMENT THROUGH VETERINARY SCIENCE 3

The Eyes Have It!

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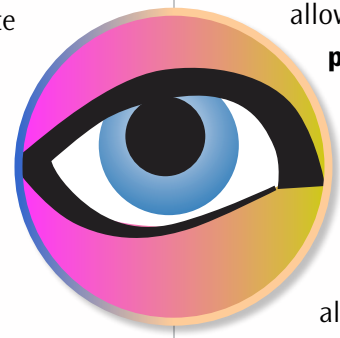
Subject Overview and Background Information

The five senses—**sight**, **hearing**, **taste**, **smell**, and **touch**—help animals collect information from their environments that aids in their survival. For example, sight helps animals locate food and avoid danger; hearing helps animals communicate with other animals; smell and taste are used to locate and choose foods; and touch helps animals detect different textures and temperatures in their environment. These senses are part of the **sensory system,** which receives and processes information from the environment.



An important part of a routine medical checkup of any animal includes an examination of the organs associated with the sensory system. Veterinarians look for discharges (color; consistency; texture) from the eyes and nose; check eyes for color, clarity, and the responsiveness of the pupils; examine ears for odor, discharge, inflammation, and scabs; inspect animal coats and skin for cuts, abrasions, scratches, and sensitivity to touch; and check an animal's mouth and tongue for odor, cuts, and sores. If the organs of the sensory system are not working properly, the animal will not be able to assess its environment accurately.

The **eye**, an animal's organ of vision, functions by allowing light to enter through an opening called the **pupil**. Not only does the pupil allow light to enter the eye, it also regulates the amount of light that passes through the opening. Under bright light conditions, the pupil **constricts** (becomes smaller) and allows less light to enter; under dim light conditions it **dilates** (becomes larger) and allows more light to enter.

The appearance and symmetry of the pupils can be important in determining an animal's general health. Veterinary practitioners routinely check an animal's pupils for symptoms of underlying eye disease or other health problems such as head or eye injury, nervous system disorders, glaucoma, and diabetes.

◆ Activity Concepts and Vocabulary

- **Constriction (kuh n-strik-shuh n)**: Making something narrower.
- **Dilation (dieley-shuhn)**: Making something bigger or wider or stretching it.
- **Eye**: An organ in the body that allows an animal to see.
- **Pupil**: The dark part in the center of the eye where light enters.
- **Sensory system**: A part of an animal's nervous system that includes the senses of sight, smell, hearing, taste, and touch.

◆ Life Skills

- **Head**: Keeping records, critical thinking
- **Heart**: Cooperation, communication, sharing
- **Hands**: Teamwork
- **Health**: Disease prevention

◆ Subject Links

Science and Language Arts

◆ State Content Standards

Science

- Grade 4
  - *Investigation and Experimentation: 6c*
- Grade 5
  - *Investigation and Experimentation: 6h*
- Grade 6
  - *Investigation and Experimentation: 7d, 7e*

Language Arts

- Grade 3
  - *Listening and Speaking Strategies: 1.8*
- Grade 4
  - *Listening and Speaking Strategies: 1.7, 1.8*
- Grade 5
  - *Listening and Speaking Strategies: 1.5*
- Grade 6
  - *Listening and Speaking Strategies: 1.5*

◆ Purpose of Activity

The purpose of this activity is to have youth make observations on changes to their eyes and eyesight when exposed to different types of stimuli.

ACTIVITY
The Eyes Have It!

Overview of the Activity

The youth will participate in activities in which they will be exposed to different environments and will make observations on what happens to their sense of vision. Youth will also be able to examine each other's eyes with a penlight and make observations on changes in the appearance of their eyes.

◆ Time Required

40 to 60 minutes

◆ Suggested Groupings

Pairs

◆ Materials Needed for Each pair

*(*Materials provided in the curriculum)*

- Flip chart paper
- Colored markers
- Penlight
- *Picture of a human eye
- *Pictures of animal eyes

◆ Getting Ready

- Organize the materials.
- Make enough copies of the human eye and animal eye pictures for each pair.
- Divide the youth into pairs.

Opening Questions

Ask the youth to respond to each question below by sharing their ideas verbally and/or by recording them on the flip chart paper provided.

1. What are our senses, and why do you think they are important?
2. What do you know about your eyes and how they work? What do you think the purpose of our eyes is?
3. What do you know about animals' senses, and why do you think they are important?

Procedure 1 (Experiencing)

1. Have one member of each pair stand outside on a bright day (or inside in a brightly lit room) for 2 minutes. After this time, have them step quickly into a darkened room and observe their surroundings. (**Note:** The room must be very dark for this activity to work effectively.) How did their surroundings appear when they first stepped into the darkened room? How, if at all, did their vision change after 2 minutes? Ask the youth to record their observations on the paper provided.
2. Have the second member of each pair stand in a darkened room for 2 minutes. After this time, have them step quickly into a brightly lit room (or step outside on a bright, sunny day) and observe their surroundings. How did their surroundings appear when they first stepped into the bright room or outside on a sunny day? How, if at all, did their vision change after 2 minutes? Ask the youth to record their observations on the paper provided.
3. Ask the youth in each pair to compare their observations. Ask the youth in the different groups to compare and discuss their results.

Procedure 2 (Experiencing)

1. Have one member of each pair stand facing the second partner while staring straight ahead.
2. Have the second individual take the penlight and point it to the outside of the right eye toward the right ear. Then, slowly move the light to the left so that it eventually passes over the right eye. Ask the youth to observe the eye as the light gets closer and reaction of the pupil as the light passes over it and record their observations on the paper provided. (**Note:** The eye must be kept open. Also, do not leave the beam of light on the eye for more than a few seconds.)
3. Repeat Step 2 with the left eye.
4. Switch partners.

Sharing, Processing, and Generalizing

Follow the lines of thinking developed through general thoughts, observations, and questions raised by the youth as they share and compare their thoughts and observations from Procedures 1 and 2; if necessary, use more targeted questions as prompts to get to particular points, such as:

1. Describe what happened to the eye as the penlight came toward the eye. Ask the youth to share their ideas verbally and/or record them on the flip chart paper provided.
2. In your opinion, explain the purposes of the eye's response as the light passed over it. Ask the youth to share their ideas verbally and/or record them on the flip chart paper provided.
3. How might the results from Procedure 2 be helpful in explaining the results from Procedure 1? Ask the youth to share their ideas verbally and/or record them on the flip chart paper provided.

Concept and Term Discovery/ Introduction

Volunteers need to ensure that the term **pupil** and the concepts of eye **dilation** and **constriction** have been introduced or discovered by the youth. This is a good time to provide the youth with a copy of the human eye picture.

- **Note**: The goal is to have the youth discover the concepts and terms on their own. It helps if they can define terms and concepts using their own words.
- **Volunteer Tip:** Introduce reasons for checking an animal's pupils as part of a regular veterinary exam (see "Subject Overview and Background Information," above).

Concept Application

1. Have the youth look at the "Human Eye" handout and compare it with their partner's eyes. Can they identify the parts shown?
2. Have youth look at the pictures of animal eyes and make observations and comparisons. Ask them to record their thoughts and ideas on the paper provided, and then share their observations and comparisons.
3. If the youth own their own animals, have them observe their eyes and make observations and comparisons with the eyes of other animals. Ask them to record their thoughts and ideas and then share their observations and comparisons.

References

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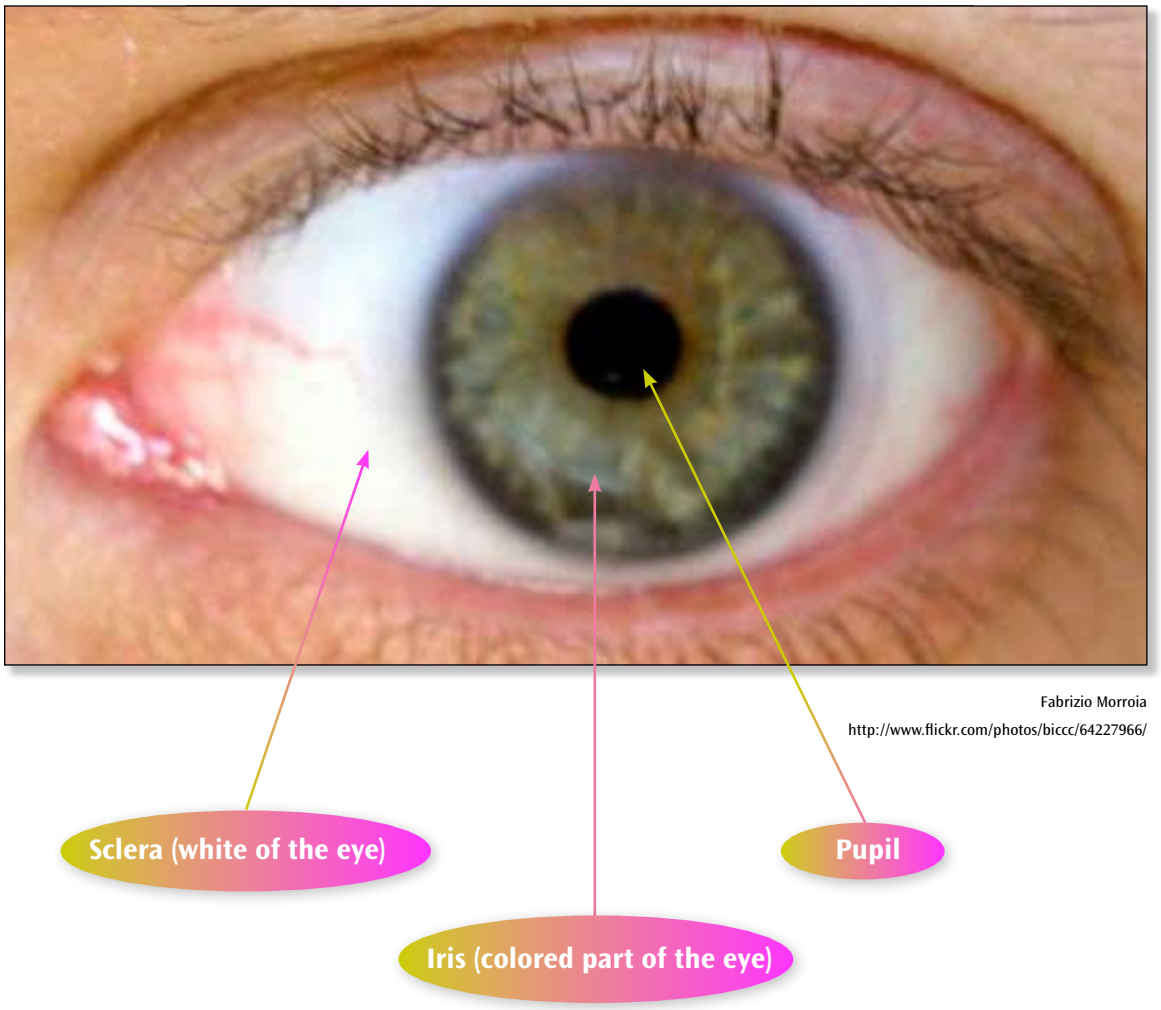
The Physics Classroom. Lesson 6: The Eye. Glenbrook South (High School) Physics Home Page Web site, http://www.glenbrook.k12.il.us/GBSSCI/PHYS/CLASS/refrn/u14l6a.html.

WebMD. Eye health: The amazing human eye: Your guide to how the eye sees. WebMD Web site, http://www.webmd.com/content/article/63/72016.htm.

Human Eye



Fabrizio Morroia
http://www.flickr.com/photos/bicccc/64227966/

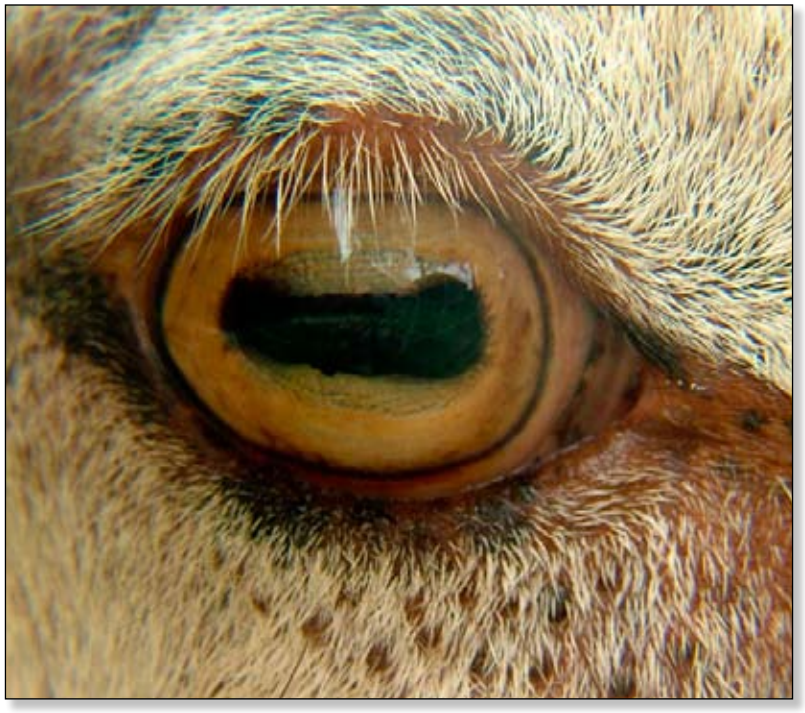
Owl

Mark Robinson
http://www.flickr.com/photos/66176388@N00/201132590/

Cat

"Emuishere Peliculas"
http://www.flickr.com/photos/bizzzarro/253213192/

Sheep



Jannes Pockele
http://www.flickr.com/photos/jpockele/160702444/

Human

audi_inspiration

http://www.flickr.com/photos/audiinsperation/2857475928/

Frog

Robert Kraft

http://www.publicdomainpictures.net/view-image.php?image=1041&large=1

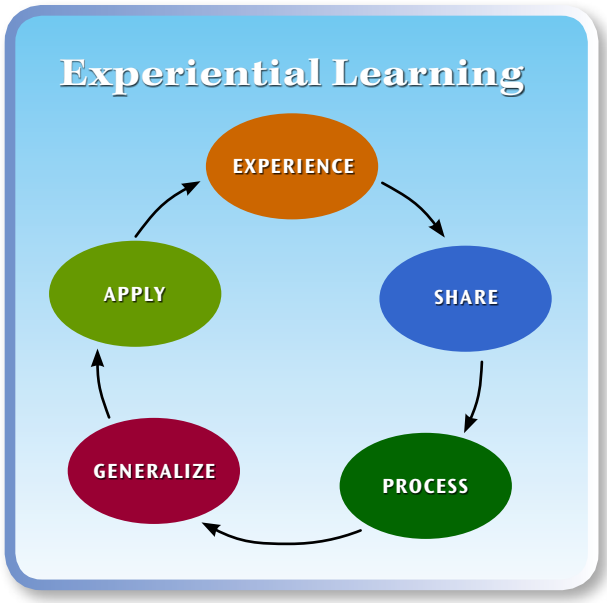
Lizard

Anna Cervova

http://www.publicdomainpictures.net/view-image.php?image=807

APPENDIX

The activity in this curriculum is designed around inquiry and experiential learning. Inquiry is a learner-centered approach in which individuals are problem solvers investigating questions through active engagement, observing and manipulating objects and phenomena, and acquiring or discovering knowledge. Experiential learning (EL) is a foundational educational strategy used in 4-H. In it, the learner has an experience phase of engagement in an activity, a reflection phase in which observations and reactions are shared and discussed, and an application phase in which new knowledge and skills are applied to a real-life setting. In 4-H, an EL model that uses a 5-step learning cycle is most commonly used. These five steps—Exploration, Sharing, Processing, Generalizing, and Application—are part of a recurring process that helps build learner understanding over time.



For more information on inquiry, EL and the 5-step learning cycle, please visit the University of California's Science, Technology, Environmental Literacy Workgroup's Experiential Learning Web site, http://www.experientiallearning.ucdavis.edu/default.shtml.

For Further Information

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Publication 8339
ISBN-13: 978-1-60107-584-0

pr-3/09-SB/RW