

ARRRRRRGH! Me Eye Hurts

ACTIVITY OVERVIEW

STEM Focus Area: Biology

Learning Goal: Learn about the different layers of the human eye and their significance.

Youth Learning Targets:

- "I know what the layers of my eye are."
- "I know what each part of my eye does."

LEARNING ENVIRONMENT

Activity Duration: 1 hour

Class Size: Small group or virtual

Age of Youth: Grades 2 – 5

Guiding Question - What is the question to explore OR the problem or challenge to solve?

How does our vision change to adapt to changes in the environment?

Throughout this activity, youth will:

- *Examine what their eyes do and how they work in different situations.*
- *Brainstorm why a pirate would wear an eye patch and how that would affect their vision.*
- *Create an eye patch to experience how their vision changes and reflect as a group.*

Facilitator Prep:

- *Facilitators will need to print the [Inside Your Eye](#) and [How Your Eye Works](#) handouts for each student.*
- *Facilitators will need to prepare the mystery box: place an object inside a closed box that allows for students to reach in and feel it without seeing it. Use something with the consistency of an eye to give the illusion it may be an eyeball in the box.*
- *Facilitators will need to gather the needed materials for the activity and set up work stations.*

Literacy Connection:

- *[Eye: How it Works](#) by David Macaulay combines text and illustrations to tell the story of how our amazing eyes work. How can you tell if your shirt is inside out? How can you see if the soccer ball is coming at you? Find out with this exciting story for newly independent readers.*

Facilitator Checklist in the Learning Environment:

- Predict and hypothesize
- Develop and use models
- Measure materials
- Observe
- Investigate
- Record observations

- Analyze and infer
- Share and communicate data
- Interpret data
- Test and revise
- Draw conclusions and relationships
- Have voice and agency, make decisions and guide their own learning

PREPARATION

Materials:

- For each student an *Inside Your Eye and How Your Eye Works* handout
 - o [Activity Sheet 1 - How the Eyes Work](#)
 - o [Eye Diagram](#)
- For each student, materials to make an eye patch
 - o String or yarn
 - o Cardboard paper, foam, or cardstock
 - o Hole punch
- For the whole group, a mystery box
 - o Create a mystery box in which students won't be able to see what is placed inside. Place something that may have the same consistency as an eye to give the illusion that it may be eyes in the box.

Room

- Arrange the room with the mystery box centrally located. Arrange students in a way that encourages a large group discussion pre and post activity.

Content

Which part of your body lets you read the back of a cereal box, check out a rainbow, and see a softball heading your way? Which part lets you cry when you're sad and makes tears to protect itself? Which part has muscles that adjust to let you focus on things that are close up or far away? If you guessed the eye, you're right!

Your eyes are at work from the moment you wake up to the moment you close them to go to sleep. They take in tons of information about the world around you — shapes, colors, movements, and more. Then they send the information to your brain for processing so the brain knows what's going on outside of your body.

Common misconceptions:

If you cross your eyes, they'll stay that way. Your eye muscles allow you to move your eyes in all directions. Looking left, right, up, or down will not force them to stay in that position.

People who are color blind see in black and white. Most people who are color blind see partial color. The most severe form of color blindness, where you see everything in shades of grey, is very uncommon. Most people who are color blind have a hard time telling the difference between green and red.

Inquiry

It is your primary goal as facilitator to encourage youth to explore and discuss as a group how human eyes work and how their environment affects their vision. You can prompt this discussion with questions like the following:

- *What do your eyes do for your body?*
- *Are there times when you have a harder time seeing? What did you do to see better?*
- *What are things that are used to help people see better?*

Facilitator Checklist for Preparation:

- Organization: I practiced the activity/technology, prepared materials/extras/place to record youth ideas, completed an activity.
- Materials: Materials are appropriate for teaching the learning goals; youth will be able to use them and will think they are appealing.
- Space Utilization: The space is set up appropriately for the activity and there will be no safety issues or distractions.
- Relevance: I have researched why the content matters to youth's everyday lives.

- Content Learning: I have become familiar with the content.
- Inquiry: I have become familiar with how authentic, age-appropriate inquiry practices look in this activity.

INTRODUCTION TO ACTIVITY (15 MINUTES)

Begin by introducing the topic and assessing what knowledge the class has on how their eyes work and what the parts of the eye are. Ask the class a few questions about what they know about the human eye, the parts that make up our eyes, and how vision works.

Facilitator Checklist for Introduction to Activity:

- Space Utilization: I will use the space informally avoiding the lecture hall format.
- Purposeful Activities: This intro section gets youth on track for the learning goal.
- Content Learning: If age appropriate, I will accurately present content.
- Inquiry: In this or another section of the activity, youth carry out one or more inquiry practices.
- Relationships: I will make each youth feel welcome.
- Relevance: In this or another section, I will guide the youth in a sustained discussion of how the activity relates to their everyday lives.
- Youth Voice: In this or another section, I will allow youth the opportunity to make decisions about their learning experiences.

ACTIVITY ENGAGEMENT (30 MINUTES)

Use the Inside Your Eye and How Your Eyes Work handouts to teach about the different layers of the human eye and what each part does. Bring out your mystery box and how each student try and identify what object is in the box without being able to use their vision.

Regroup and transition to a brainstorming session about why students think pirates wore eye patches. After brainstorming some ideas inform students of the reasons why pirates wore eye patches:

- *Going from bright daylight into the dark, sailors could not see until their eyes adapted to the low light below the decks. When below the deck they would uncover the patched eye to see better in the dark because the covered eye was already adapted to the dark.*
- *The lack of medical care when pirates roamed the seas! Any kind of injury to the eye could go bad, causing them to lose their eye.*
- *Some pirates wore them to give the illusion that they were tough and not to be messed with.*

Transition to the activity, where students make their own eye patches. Measure students' heads with string and give them each a string. Have students cut out whatever shape they would like their eye patch to be from foam/construction/cardboard paper. Punch holes into the eye patches, pull the string through the two holes, and knot it so the student can wear their eye patch.

Have students wear the eye patches for a few minutes and experiment with how their vision changes or what their eyes feel like.

Facilitator Checklist for Activity Engagement:

- Space Utilization: I will use the space informally avoiding the lecture hall format.
- Participation: All youth will have access to the activity.
- Purposeful Activities: This core section helps youth to move toward the learning goal.
- Engagement: This activity has youth physically engaged with their hands and their minds.
- Inquiry: In this or another section of the activity, youth carry out one or more inquiry practices.
- Reflection: If appropriate, I will ask youth questions during the core activity that will help them make sense of what they are learning.

- Relationships: I will take steps to share my enthusiasm and create a nurturing, safe learning environment.
- Relevance: In this or another section, I will guide the youth in a sustained discussion of how the activity relates to their everyday lives.
- Youth Voice: In this or another section, I will allow youth the opportunity to make decisions about their learning experiences.

REFLECTION & RELEVANCE: (15 MINUTES)

Have students reflect in small groups and then share with the whole group. Review and discuss what students learned about the parts of the eye, their function and importance, how our vision works, and why pirates wore eye patches.

Facilitator Checklist for Activity Reflection & Relevance:

- Space Utilization: Again, I will use the space informally.
- Participation: I will prompt youth who do not have access to the activity to participate.
- Purposeful Activities: The closing section helps youth to reach the learning goal.
- Content Learning: I will help youth make connections between different ideas. I will create opportunities for youth to ask questions/provide ideas that show a deeper level of understanding.
- Inquiry: In this or another section of the activity, youth carry out one or more inquiry practices.
- Reflection. I will provide youth with a sustained opportunity to make sense of their learning.
- Relevance: In this or another section, I will guide the youth in a sustained discussion of how the activity relates to their everyday lives.
- Youth Voice: In this or another section, I will allow youth the opportunity to make decisions about their learning experiences.