

Wetland Organism Investigation

4th Grade driving question: How can I, along with my family and community, positively affect our watershed?

Investigative Questions for this activity:

1. Can specific organisms have their life needs met in the wetland we are exploring?
2. How might organisms in this wetland be affected by erosion and runoff?

End-of-activity reflection question (SOL big idea reflection): What did I learn about the life needs of Virginia wetland organisms and how erosion and other pollutants can affect their health?

Goal: Students make observations and conduct tests to determine if an organism's life needs can be met at the site. Students then infer (from information sheets and their observations) how the organism may be affected by soil erosion and pollution.

Link to organism cards and data sheets [☰ Wetland Organism Info Sheets - Modified](#)

Objectives

Knowledge: Organisms in a habitat interact with one another, depend on each other for energy, and depend on their specific abiotic tolerances to thrive and build their populations.

Skills: Students develop and enhance science skills of observation, inference, and communication.

Values: Students appreciate how organisms interact in an ecosystem and the importance of adaptations for survival. Students realize the effect erosion and human impacts can have on our watershed system.

Stewardship: Humans impact ecosystems. The actions we take may have a negative effect but can be mitigated or repaired.

Special Safety:

- Watch out for physical hazards: uneven ground, low hanging branches, holes, vines, or roots that may be a trip hazard.
- Be wary of harmful plants such as cactus, poison ivy, or plants with thorns.
- Rocks may be slippery. Advise students to walk carefully.

Grade:4

Virginia SOL addressed

Science: 2018 4.1b, d.; 4.3a, 4.8

4.8 Big Idea (central idea): Virginia has many natural resources including watersheds, minerals, rocks, ores, soil, land & forests.

4.3 Big Idea: Each organism has a specific niche that provides basic needs to support life processes.

This activity helps students learn about some of the diverse organisms (resources) that live in an aquatic ecosystem of the Chesapeake Bay watershed. They also learn about important needs for these organisms' survival: dependence on other organisms for food and dependence on the abiotic resources within the ecosystem. Third, they learn that organism health and survival can be affected by erosion and other pollutants.

VA Science SOL 4.8 Curriculum Framework: = Science & Engineering Practice (SEP)

4.8 The student will investigate and understand that Virginia has important natural resources. Key resources include:

b. plants and animals;

d. forests, soil, and land.

This activity helps develop skill in SEP 4.1 a) asking questions and defining problems: develop hypotheses as cause-and-effect relations

& 4.1d constructing and critiquing conclusions and explanations: use evidence (i.e., measurements, observations, patterns) to construct or support explanations and to make inferences. **The essential knowledge and practices are highlighted yellow.**

Enduring Understandings	Essential Knowledge and Practices
<p>Natural resources are necessary or useful to humans. Many natural resources are distributed unevenly around the planet.</p> <ul style="list-style-type: none"> • Virginia has many natural resources. Some examples of Virginia’s natural resources include minerals, plants, animals, water, soil, and land (4.8 a, b, c, d). • Virginia has a great variety of plant and animal resources. Plants hold soil in place to reduce erosion, which aids in improving water quality. Plants provide food, materials for shelter, habitats, and add oxygen to the air. Animals provide materials such as food, fiber, and leather (4.8 b). • Healthy populations of plants and animals are critical for life (4.8 b). • Virginia’s soil and land support a great variety of life and provide space for us to live, work, and play (4.8 d). 	<p>In order to meet this standard, it is expected that students will</p> <ul style="list-style-type: none"> • use evidence to explain the statement, “We all live downstream.” (4.8 a) • explain the importance of Virginia’s animals and plants to humans (4.8 b) • describe a variety of important land uses in Virginia, including natural and cultivated forests (4.8 d) • investigate the school yard or local ecosystem to identify questions, problems, or issues that affect a natural resource in that area and determine a possible solution to an identified problem (4.8 a, b, c, d).

4.3 The student will investigate and understand that organisms, including humans, interact with one another and with the nonliving components in the ecosystem. Key ideas include
a) interrelationships exist in populations, communities, and ecosystems;
b) food webs show the flow of energy within an ecosystem;

From the Curriculum Framework for Science 4.3

Enduring Understandings	Essential Knowledge and Practices
<p>The life processes of plants and animals are interdependent and contribute to the flow of energy and cycles of matter within an ecosystem.</p> <ul style="list-style-type: none"> • The interactions and organization within an ecosystem is based on the utilization of the energy from the sun. The greatest amount of energy in an ecosystem is in the producers (4.3 a, b). • The sun’s energy cycles through ecosystems from producers through consumers and back into the nutrient pool through decomposers (4.3 b). • Within a community, organisms are dependent on the survival of other organisms. Energy is passed from one organism to another as modeled in a food chain or food web (4.3 a, b). 	<p>In order to meet this standard, it is expected that students will</p> <ul style="list-style-type: none"> • analyze and model how populations, communities, and ecosystems interrelate (4.3 a) • research animals and plants in a local environment and describe interrelationships among these organisms (4.3 b) • construct a food web demonstrating the flow of energy through an ecosystem (4.3 b) • illustrate the food webs in a local area (4.3 b)

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| <ul style="list-style-type: none">● A food web illustrates the interconnected and overlapping food chains in an ecosystem. The arrow in a food chain always points to the organism doing the eating. These arrows show the flow of energy within the food chain (4.3 b). <i>Students are not responsible for food pyramids.</i> | |
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Materials:

- Species information sheets
- Student data sheets
- Clipboards
- Pencils
- Soil Texture Key
- Small beakers (or pint containers) of water
- Pipettes
- Wetland plant key
- Hand washing bucket and towels
- Bucket of soil
- Mats
- D Net
- Insect Jars
- Binoculars for Bird group
- White/light colored buckets for samples (for water samples)
- Hand lenses
- Wetland Organism keys

Special Safety: Caution students to move carefully on rocks, avoid cactus, don't go in the water.

SETUP Print Datasheets; prepare bin with materials listed above; place at Lake Georgette

Instructional Strategy:

1. Instruct students to take a moment to look and listen to this ecosystem. Have a brief discussion about what they noticed. Ask them to consider how the organisms (this word may need to be explained) around them are interconnected. How could the ways humans interact with the land and habitat here have an impact?
2. Depending on the independence and comfort of the group, this activity can be done in small groups working together, or as the entire class progressing through each of the tests to collect data. All tests and information on the species information sheets follow the same order.
3. Divide the class into 5-6 groups (there are 6 organisms to investigate). Each group gets one organism. Instruct them to look over the species information sheet and datasheet, at the additional materials, then ask for volunteers to explain what they are going to be doing. At this time, you can decide if you want groups to work independently or if the tests will be done simultaneously as one big class.
4. Students work through the tests and investigations, recording the data in their journals.
5. As a class, students will share their findings: What is their organism? Could this organism live at this site? How can erosion, pollution, and human activity affect the organism?
6. Summarize your organism's life needs and write a sentence (starts with a capital letter, ends with punctuation) describing how your organism fits into this habitat.
7. On the second page, build a food web with your organism, the organisms the other groups learned about, and anything else you observed. Be sure to include elements from some of the tests and observations you conducted. It's OK to ask other groups for clarification about their organisms and findings.

Abbreviated Instruction

Organisms have certain life needs that need to be met for survival. Read the information provided, make observations, and conduct tests to determine if your organism's life needs can be met at this habitat.

1. Before conducting any observations/experiments, read the Information Sheet, and look over the Data Sheet.
2. Conduct observations and tests. If after reading carefully and talking with your team, you are unsure of how to collect or record any data, **ask for help**.
3. Once you have completed tests and investigations, discuss the following questions with your group: Could this organism live at this site? How can erosion and pollution affect the organism?
4. Summarize your organism's life needs.
5. Build a food web with your organism and the rest of the class.