



Otters, Otters Everywhere (Learning Experience # 1)

Lesson Plan



Overview

Students view a video of river otters, then research questions about their physical and behavioral adaptations to life as the top carnivores in many North American waterways. An activity using beads to represent molecules helps students understand the role of biomagnification of persistent toxins as they discover the causes of the disappearance of these clowns of the stream from parts of the Bay watershed.

Lesson Essential Question: How do humans contribute to the loss of a species from an ecosystem?

Objectives

The students will:

- work productively as a part of a project team.
- use a variety of resources to investigate the background information necessary for this project.
- research and summarize information about the life and habits of the river otter.
- discover the reasons for the loss of the river otter from most of Pennsylvania's streams and the consequences.
- keep accurate, complete records in a journal

Materials Needed for *Otters, Otters Everywhere*

- A packet per group containing one copy of each of the following documents:
 - *You Otter be an Otter* (Student Sheet #1)
 - *More isn't Always Better* (Student Sheet #2)
 - *Exit Interview* (Student Sheet #3)
 - Map of the river otter's range





Materials for biomagnification learning activity, *More isn't Always Better* (Student Sheet #2)

For each team of students:

- 10 small cups (5-10 mL)
- 100 small white beads
- 10 small blue beads
- 2 medium cups or beakers (100 mL)
- 2 sticky notes or labels

For the class:

- 2 large cups or beakers (500 mL)
- 2 extra-large containers or beakers (1000 mL)
- 3 sticky notes or labels

General Supplies

- Notebooks or small binders or folders to be used as journals, one per student
- Chart paper and markers
- Computer with internet access for each group

Grade Level 8-12

Subject Areas

Environmental science, biology, government, economics, arts (optional)

Timeline

Teacher preparation: 40 minutes

Learning Experience: 100 minutes

Setting

Classroom, library or computer lab





Skills

Research in print materials and on web sites, organize information, problem solve as part of a team, communicate to team and classmates

Vocabulary

Abiotic, bioaccumulation, biodiversity, biomagnification, biotic, extirpate, food chain, food web, native species, habitat, natural community, niche, predator, riparian, species, trophic level

Advance Preparation Needed

Make copies of the student sheets listed, one for each project team. Provide chart paper and markers or access to technology that will allow students to present their ideas to their classmates. Provide otter videos for each student team. Provide materials for the *More is not Always Better* learning experience.

Procedure

1. Post the essential questions for the river otter scenario and for the learning experience at the top of a sheet of chart paper. You will add the class answers for LE #1 at the end of this activity.
2. Introduce the learning experience by having students view a video of river otters at play, swimming, eating, etc. Ask them to write a reflection in their journals about the otters and how they feel about them. Do they like them? Would they like to see some otters in the wild?
3. Assign students to project teams of three or four members. Each team member should have a task: researcher (may have two of these), recorder, communicator. Grouping students with a variety of abilities will promote peer teaching and differentiation of instruction.
4. Have teams look at the maps of the range of the river otters. Ask each team to suggest which one shows the range of the otter in the early 1700's and which one is the range in the 1970's, and why they think so. Their answers and reasoning should be noted in their journals.





5. Follow up with these questions: *Has anyone ever seen a river otter? If so, where? Why do most people see them in a zoo or wildlife park instead of in the wild?* (They are shy, nocturnal, and rare or extinct in some areas).
6. Ask teams to complete the graphic organizer and questions on Student Sheet #1, *You Otter be an Otter*. Remind teams to list all of their sources of information including any videos they view. Students should use citation protocol as per the approved district curricula.
7. Ask a representative from each group to share at least one river otter characteristic with the rest of the class, pointing out how that characteristic makes otters ideally suited to live and reproduce in streams and ponds of the Chesapeake Bay watershed, or how that characteristic may explain why otters have disappeared from much of their historic range.
8. Since otters occupy the top of their food web, they are subject to biomagnification of toxins that are present in polluted waterways and bodies of water where they live. The learning activity in *More is not Always Better* (Student Sheet #2) will help students discover what biomagnification means and why it causes problems for the top predator in any food web. Ask students to write a reflection in their journals on the dangers that biomagnification of toxins poses to humans who consume top predators. Examples may include game fish (i.e. tuna, salmon and bass) living in heavily polluted waters.
9. As student teams complete *Exit Interview* (Student Sheet #3), they will discover the reasons why river otters disappeared from much of their historic range. Student answers should include factors such as habitat loss from development by humans; water pollution from industrial sites, acid mine drainage, and untreated sewage; overharvesting by trappers; loss of prey species; etc. Student Sheet #3 may be used as a summative assessment for this learning experience.