

Lesson Title: Posted: No Fishing!

Ohio Standards Connection:

Standard(s): Life Science

Benchmark(s): (grades 3-5) B. Analyze plant and animal structures and functions needed for survival and describe the flow of energy through a system that all organisms use to survive.

Indicator(s):

Grade(5) 3. Trace the organization of simple food chains and food webs (e.g., producers, herbivores, carnivores, omnivores and decomposers).

Benchmark(s): (grades 6-8) C. Explain how energy entering the ecosystem as sunlight supports the life of organisms through photosynthesis and transfer of energy through the interactions of organisms and the environment.

Indicator(s):

Grade(7) 2. Investigate how organisms or populations may interact with one another through symbiotic relationships and how some species have become so adapted to each other that neither could survive without the other (e.g., predator-prey, parasitism, mutualism, commensalism).

3. Explain how the number of organisms an ecosystem can support depends on adequate biotic (living) resources (e.g., plants, animals) and abiotic (non-living) resources (e.g., light, water, soil).

6. Summarize the ways that natural occurrences and human activity affect the transfer of energy in Earth's ecosystems (e.g., fire, hurricanes, roads, oil spills).

Lesson Summary: The students will play a game to learn that it is not always safe to eat fish they catch, write a story about taking a trip to the beach and finding swimming prohibited and recognize that environmental laws protect their health.

Estimated Duration: Class period

Background:

The first Federal law dealing exclusively with water quality was passed in 1948. It set aside government money for research. Offenders of the law only received a weak punishment. In 1969 the National Environmental Policy Act started all the environmental protection legislation. In 1972 the Clean Water Act was passed and in 1977 and 1987 more water quality regulations were added. The protection of human health is the most important goal of these laws.

Despite the passage of such laws, we still must deal with water quality issues. Some polluting happens now, but often we are faced with pollution that entered the environment years ago. This is the case with chemicals like DDT and PCBs; they do not break down in the environment and so tend to settle and collect in sediment on the bottom of bodies of water. They sometimes find their ways into food chains, ending up in fish that may end up on fishermen's lines. Waters are

posted in such cases to prevent people from eating fish that might contain dangerous levels of chemicals.

Sometimes warning signs are posted around water bodies to prevent swimming because the water has been found to have unsafe levels of coliform bacteria from fecal contamination (human and animal waste). Coliforms are used as indicators for the presence of pathogens (disease-causing organisms). Fecal contamination represents on-going problems with waste management, not a long-ago problem, as the chemical pollution sometimes does.

Instructional Procedures:

ADVANCE PREPARATION Make a fish for each of two-thirds of your students. Fold a sheet of construction paper in half and cut out a simple fish shape, leaving it hinged on the fold. For half of them, open the fish, and write one of the messages below (“I ate . . .”) inside.

I. Setting the stage

Share the background information with the students (as appropriate). Remind them that when clean water becomes polluted, it can cause diseases and upset the balance of nature. This requires people to set standards for water quality.

II. Activities

A. Take the students outside to play the “Going Fishing Game.”

1. Divide the class into three equal groups. One group will be the fishermen/women. Take the other two groups aside. They will not know if they are healthy fish or unhealthy fish. Each one will get a folded paper cut in the shape of a fish taped to his/her back. Half will be healthy fish with nothing written on the inside. The other half will have one of these notes written inside (where the fishermen can’t see them): “I ate PCBs,” “I ate pesticides,” “I ate dioxin,” “I ate mercury.”
2. Designate the area that will be the lake or river. Fish must stay in this area. Designate (using chalk or jump ropes) the “boat” area that will be big enough to contain the whole class. Fishermen/women must start in the boat. On a given signal, fishermen/women start “fishing.” They must run after the fish and catch two fish and take them back to the boat. When all the fish are caught and in the boat, the fishermen look inside the paper fish on each fish’s back to see if they caught healthy or contaminated fish. If he/she catches 2 contaminated fish, he/she will not be dining on fresh fish (unless the family goes out to eat!).
3. Ask the students how many will be going out to eat. Should there be a sign at this lake that says, “No fishing”? (yes)

B. Have the students write a story about “My Imaginary Trip to (lake, ocean, river — whatever is near you).” Teach paragraphing by using the following topics:

1. Planning my trip
2. Packing for the trip
3. Arriving at the beach and seeing a “No Swimming — Polluted Water” sign posted
4. Feeling disappointed
5. (Optional) What I did instead of going swimming.

III. Follow Up

A. Ask the students what it means when a “No fishing” or “No swimming” sign is posted. Does this always mean the water is polluted? (No; it could mean something else, e.g., this lake is on private property and the owner doesn’t want you to do these things.) Tell them that if the water is polluted, or if there is some other possible danger there, the signs will explain it.

B. Remind the students that the first goal of the laws to protect the environment is to protect people’s health. Discuss with the students how they should react when they see a sign prohibiting fishing or swimming. Would they do it anyway? Why or why not?

C. (Optional) Have the students write a paragraph on what they learned in this lesson.

IV. Extensions

A. Have the students make signs like “No Fishing Allowed,” “Polluted Water,” “No Swimming,” “Contaminated Water,” and so on, and illustrate them.

B. Have them research places where water bodies have been closed to fishing and/or swimming and locate them on a U.S. map. (Or find out if any nearby waters have been closed to fishing and/or swimming.)

C. Have each student write a creative story or draw a cartoon in which he/she is a fish. Have them decide what species of fish they are, where they live, and what they eat, making up names for themselves and the lakes in which they live. (NOTE: Remind students these are proper nouns.) In the story or cartoon, have the fish fight water pollution.

RESOURCES

Lucas, Eileen, *Water: A Resource in Crisis*, Childrens Press, Chicago, 1991, p. 52.

“Water Quality Fact Sheets,” Tennessee Valley Authority, TVA/ONRED/LER, 1988.

Materials and Resources:

- construction paper
- scissors
- markers
- masking tape
- art paper
- crayons
- U.S. map

Vocabulary:

DDT (dichlorodiphenyltrichloroethane): an insecticide that does not break down in the environment. Once widely used but now prohibited from most uses in the U.S.

dioxin: a toxic by-product of the manufacture of certain pesticides and other products.

mercury: a poisonous metallic element, Hg, atomic number 80, atomic weight 200.59, existing at room temperature as a silvery, dense liquid.

PCBs (polychlorobiphenyls): industrial chemicals that do not break down in the environment; once widely used in electrical transformers but now prohibited in the U.S.A.

pesticide: any chemical or biological agent that kills plant or animal pests; herbicides, insecticides, fungicides, rodenticides, etc., are all pesticides.