

LIVING IN WATER

OBJECTIVES

The student will do the following:

1. Create a pond model.
2. Research and report about plants and animals found in aquatic habitats.
3. Contribute to a pond mural.

BACKGROUND INFORMATION

A body of water where organisms live is called an aquatic habitat. One type of aquatic habitat is the freshwater habitat. Ponds, lakes, and streams are freshwater habitats. Many kinds of plants are found in or near the water. Cattails may grow at the water's edge. The roots of water lilies anchor at the bottom, while their leaves and flowers float on top of the water. Other plants live under the water.

Aquatic animals need oxygen. A few aquatic animals breathe with lungs. Most aquatic animals have gills instead of lungs, to take the oxygen they need from the water. Many animals in the water move around to find food and to get away from predators. Other animals attach themselves to objects in the water and collect their food as it floats past. Some animals that live in or near fresh water

are fish, such as bass and trout; birds, such as ducks and geese; insects, such as dragonflies and mosquitoes; amphibians, such as frogs and toads; and reptiles, such as turtles and snakes.

When aquatic biologists (scientists who study things that live in or on the water) study a lake or other body of fresh water, they look at characteristics of the habitat to assess its "health." These would include (1) the amount of dissolved oxygen in the water; (2) algal content (enough to provide food but not enough to become a burden itself); (3) the health of the fish; (4) the diversity of bottom-dwelling insect larvae, worms, shellfish, and other invertebrates (simple animals with no backbone); and (5) the amounts and types of pollution settled into the mud on the bottom of the lake. When factors such as these are in order, the lake is likely to be a healthy place for plants and animals.

Terms

aquatic: living or growing in or on the water.

organism: any living being; plants and animals.

habitat: place where an organism grows or lives.

SUBJECTS:

Science, Writing, Art

TIME:

120 minutes

MATERIALS:

aquarium or plastic containers
gravel
sand
small fish
snails
water
buckets or other containers
aquatic plants
butcher paper
blue tempera paint
magic markers
index cards
glue sticks or transparent tape
reference materials (encyclopedias, etc.)
teacher sheets (included)
acetate sheet
overhead projector
sentence strips
scissors
magnetic tape or masking tape
shoe boxes (optional)
typing paper (optional)
box cutter (optional)

ADVANCE PREPARATION

- A. Gather materials for this activity. (NOTE: Fish, sand, gravel, aquatic plants, and snails may be collected locally or purchased at an aquarium supply store or biological science supply company.)
- B. For the "Password" game, write the sentences, cut up the sentence strips, and put magnetic tape on the backs of the pieces.
- C. Make a transparency of the teacher sheet, "Checking Out the Neighborhood."

PROCEDURE

I. Setting the stage

- A. Tell the students to imagine they are aquatic organisms. Let them imagine that the classroom is a large fishbowl or pond. (If you wish, let them "swim" around briefly.)
- B. Tell the class to "become land-dwelling creatures again," and ask them to name things they think aquatic creatures would need to be healthy.

II. Activities

- A. There are at least five characteristics that indicate a healthy lake or other body of fresh water. List these on the board and briefly share with the students the information for each. You might call these "5 for Life," or "A Fish's Wishes."
 - 1. **Algae:** Just the right amount of algae means there is enough plant material for a strong food chain, but not so much that oxygen supplies are used up by the decay organisms that multiply excessively if there is too much algae (too much algae means too much dead algae).
 - 2. **Oxygen:** Water has oxygen dissolved in it. Oxygen levels in the water affect the size and number of fish, as well as other life in the lake. Without oxygen, almost all aquatic life is driven away or dies.
 - 3. **Fish:** The condition of the fish living in the water tells a lot about the condition of the lake or pond. If the fish are healthy and there are a lot of different kinds and sizes, the lake is in good condition.
 - 4. **Bottom Life:** The mud, sand, or gravel from a healthy lake bottom will include a large number and wide variety of worms, snails, crayfish, mussels, clams, and aquatic insect larvae.
 - 5. **Sediment:** Samples of mud taken from the bottom of the lake are checked to see if it contains harmful chemicals from human activities (metals, PCBs, or pesticides). This is important because pollutants settle to the lake bottom where many fish and other small animals live.

Show the students a transparency of the teacher sheet "Checking Out the Neighborhood." Review with them what each illustrated item means.

- B. Have the students make a pond model.
 - 1. For a class pond, use an aquarium. For individual ponds, have students or teams of students use large, clear plastic containers, such as large peanut butter jars. As the students watch and/or participate, review the five habitat factors.

2. Place aquarium gravel, sand, or soil on the bottom of the containers.
3. Plant the water plants from a biological supply house or aquarium supply store (many large discount stores carry aquarium supplies).
4. Add dechlorinated water. (NOTE: You may dechlorinate tap water by letting it stand out overnight or using dechlorination tablets. The water must be dechlorinated or the animals you add may become ill or die.)
5. Complete the pond by adding tadpoles or small snails and small fish to the aquarium.
6. Maintain the classroom model pond as a classroom aquarium for the remainder of the school year. Make sure animals have clean water and enough food and air.

C. Have the students draw a diagram of the model.

III. Follow-Up

A. Have the class make a pond mural.

1. Use blue tempera paint (thin works fine) to paint a blue oval on a long piece of white butcher paper.
2. Assign pairs of students a pond plant or animal.

a. Possible plants and animals:

Plants - iris, reed, water lily, willow tree

Insects - dragonfly, damselfly, water beetle, pond skater, water scorpion

Reptiles - snake, turtle

Amphibians - frog, toad, newt, salamander

Mammals - beaver, otter, mink, raccoon

Fish - carp, sunfish, perch, bullhead, bass

Birds - red-winged blackbird, duck, swan, heron, hawk

Mollusks and crustaceans - snail, mussel, crayfish

- b. Have students research their plant or animal and write one fact about it on an index card. (Ask the librarian to pull some appropriate references. Encyclopedias can also be used.)
- c. Provide magic markers and direct each pair to draw its plant or animal on the mural and paste or tape the index card near it.
- d. Let the class name their "pond." Write the name on the mural and let each student sign it (like an artist).

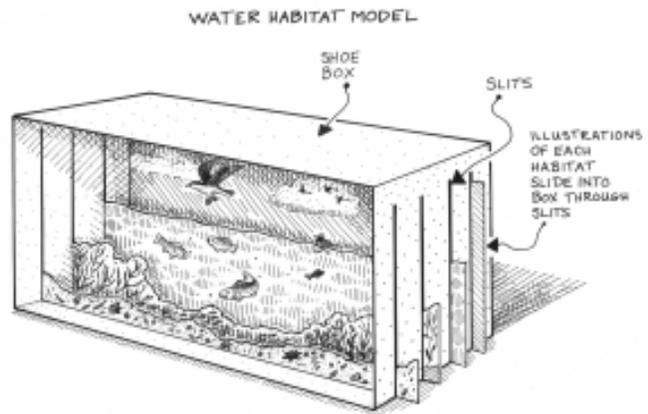
3. Display the mural on a wall outside your classroom for everyone to learn from and admire.

B. Have the students play the "Password" game on the teacher sheet, "Aquatic Password."

IV. Extensions

- A. Have the students pretend they are pond plants or animals. Tell them to write sentences or a story describing their day without revealing what they are. Have them end their writing with the question, "What am I?" Then direct students to draw and label the mystery plant or animal on the back of their papers. Compile the papers into a class book titled, A Day at the Pond. The students will have fun as they "visit a pond" by reading each other's writings.
- B. Have the students create water habitat models out of shoe boxes. (This is a good take-home activity.)

1. Cut slits on the sides of the box.
2. Use one sheet of typing paper for each aquatic habitat: bottom mud, plants anchored to the bottom, the water, and the air above the water.
3. Cut the paper to fit the slits. (The strips are progressively wider. See the figure.)
4. Have the students draw or illustrate each habitat on a separate strip of typing paper.
5. Slide the paper through the slits.



(NOTE: You might let some students make dioramas.)

RESOURCES

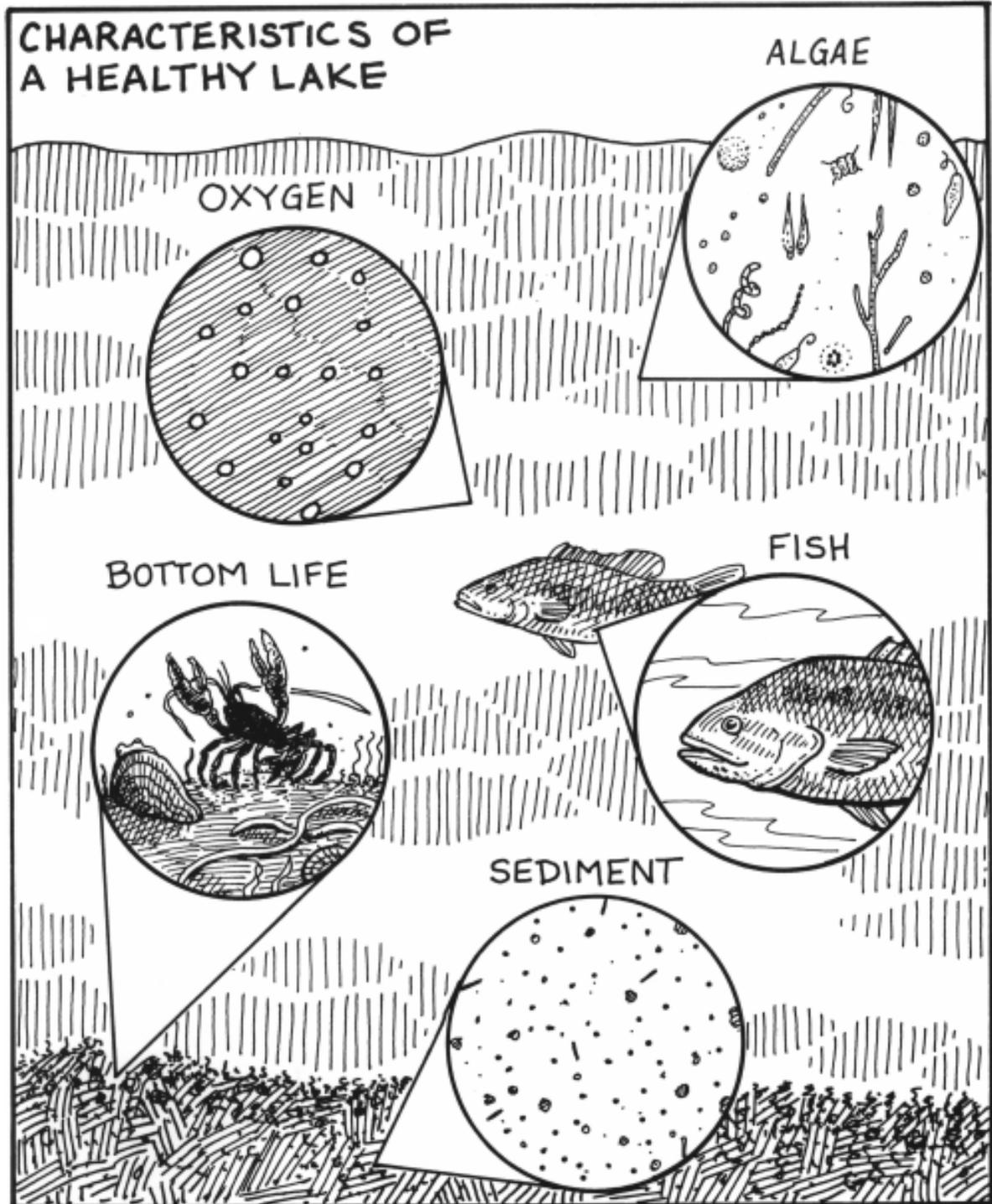
Hackett, J. K. and R. H. Moyer, Science In Your World, Macmillan/McGraw-Hill School Division, New York, 1991.

Gay, K., Water Pollution, Franklin Watts, New York, 1990.

Frank Shaffer, "Pond Life," School Days, New York, 1992, pp. 34-57.

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CHECKING OUT THE NEIGHBORHOOD



AQUATIC PASSWORD

Rules

Divide the class into six or eight teams. Let two teams come to the chalkboard at the same time. Have both teams face the classroom. At a given time, the two teams are to turn to the board. Each will arrange the mixed-up sentence in front of it in the right order. Both teams will have the same sentence. The winner is the team that finishes first. Let the teams compete, then let the winning teams compete.

Preparation

Write the sentences on colorful sentence strips. (Make two versions of each one.) Cut them up (separating the words) and put magnetic tape on the back to enable them to stick to the board (masking tape can be used).

Use the following sentences:

1. Water lily is an aquatic plant.
2. Water beetles, dragonflies, and water scorpions are insects.
3. A turtle is a reptile.
4. Frogs, toads, and salamanders are amphibians.
5. Raccoons, minks, and beavers are mammals.
6. Bass, perch, and sunfish are fish found in ponds.
7. A hawk is a bird.
8. A cattail is a water plant.
9. An otter is a mammal.
10. A heron is a bird.
11. Algae are plants.
12. Some small animals live in the bottom mud.