

Adopt a Water Friend

Subjects:

Science, Social Studies, Language Arts, Health

Process Skills:

Identifying plants and animals, classifying, collecting and analyzing data, recording observations, taking temperature, measuring pH, writing reports, problem solving

Grades:

4-8

Cognitive Task Level:

Difficult

Time for Activity:

Three 15-minute periods prior to the field trip; at least two hours for the field trip itself and one 30-minute period after the field trip.

Key Vocabulary:

Aquatic life, pollution, wildlife, waterway, biotic assessment, pH, conservation

Intended Learning Outcomes:

- Completing this activity will allow students to:
- Learn science and observation skills
- Recognize the value of conservation and habitat improvement
- Develop a sense of ownership for a natural area
- Demonstrate personal responsibility for improving water quality and reducing pollution
- Improve communication skills

Materials:

- Map of local area
- Thermometer
- Tape measure (10 feet)
- pH testing paper
- Field guides for plants and animals
- Large plastic bags for collecting litter
- Camera
- Handouts: Adopt a Water Friend data sheets

Background

Just as many cities have “adopt-a-highway” programs, students can adopt a water friend. By conducting a series of observations and recording their data, students can complete a modified version of a biotic assessment. Biotic assessments are studies conducted by biologists to determine the relative ecological health of an area by observing the number and diversity of plants and animals, checking the pH of water and soil and looking for the effect of human disturbance on an area. When completed, your class will

have made a “biotic assessment” of their water friend and its immediate surroundings. The diversity and number of plants and animals and the amount of human impact serve as indicators of the biotic “health” of an area.

Your class can develop an action plan to conserve the area and, if necessary, help it recover from pollution or disturbance. Send a copy of the biotic assessment and action plan to a local environmental organization and the newspaper to help bring public attention to the area.

Procedure

1. A week or two before selecting your water friend, ask your students to find nearby areas where water occurs. Do they know of a creek, lake, park pond, stream or inlet to adopt? Have a map of your local area ready so that you can find the places your students suggest. Keep track of their suggestions. At the end of the week, list the places. Select a good site to adopt. A site within walking distance of the school is best; students can easily return to it later in the year.

Purchase pH paper from a swimming pool supply store, science supply catalog or hardware store. Be sure to buy pH paper that ranges from 1 to 15. Follow the directions for use on the container.

2. The day before your field trip, divide your students into their groups and tell them what their jobs will be at the site. Go over proper field trip etiquette and rules. Be sure they know what is expected of them. Remind them to wear sturdy shoes and bring jackets, if necessary. If you plan to stay for lunch, remind them to bring their lunches.

3. On the day of the field trip, give your students their data sheets and assignments. Have each group fill out their data sheets. Then, as a whole class, clean up the litter or remove other evidence of human use that you can find.

4. When you return to the classroom, each group must complete a summary of what they found. Have your students work in their teams and write up a summary of what they discovered about the area (See example). One student may be selected to write the summary, or you may have each student write up their own summary. Take photographs of each team's area.

5. Place the students in groups so that each person in the group worked on a different part of the biotic assessment. Have the students read their summaries aloud to each other so that everyone learns about every activity. The combined information from all the summaries is similar to a completed biotic assessment of the area. As a class, decide whether the area you selected is a healthy one or not.

6. Develop an "action plan" which includes ideas for cleaning up and preserving your water friend. Some suggestions are as follows:

- Clean up the shoreline and help keep it clean on a regular basis.
- Find out what native plants would grow along your water friend and plant them in areas that suffer from erosion.
- Find out what kind of fish should be living in your stream, river, lake or ocean.
- Set up a pollution patrol to guard your water friend.

7. Send a copy of the biotic assessment and action plan to a local environmental organization and the newspaper to help bring public attention to the area.

8. Return to your water friend at the end of the school year. Take notes and photographs of any changes made to the area, or repeat the biotic assessment to determine what changes have occurred since the last visit.

Extensions/Modifications

- Invite a member of a local environmental organization to speak to the students about this body of water.
- Simplify the lesson by just asking students to observe their natural area and describe it.
- For more ideas on ways to expand on this lesson contact the following organizations:
- For a stream, river or lake, you can write to The Izaak Walton League of America, 707 Conservation Lane, Gaithersburg, MD 20878. Ask for the kit to keep track of your stream's water quality.
- For ocean conservation, contact The Center for Marine Conservation, 1725 De Sales St. NW, Washington DC 20036; 202-429-5609.
- Encourage your school or organization to adopt your water friend for at least five years. Keep a diary to evaluate the progress you make on a yearly basis. Try to keep the same students involved as well as bringing on new students to help.

Resources for Water Quality

Field Guides

- *Pond Life, A Golden Guide*. Golden Press. The Golden Guides are excellent for identifying the most commonly seen animals. Other good guides are *Insect, Reptiles and Amphibians, Mammals, Mushrooms, Flowers and Birds*.
- *A Field Guide to Animal Tracks*, by Olaus J. Murie. Houghton Mifflin Company. This excellent book, part of the Peterson Field Guide series, will tell you all you need to know to identify animal tracks.

Books for Students

- *Brown Pelican at the Pond*, by E. O'Reilly. Manzanita Press
- *Oil Spills: Danger in the Sea*, by Joseph E. Brown. Dodd, Mead and Co.

Books for Adults

- *Silent Spring*, by Rachel Carson. Houghton Mifflin Company. This was one of the first popular books to describe the problems associated with pollution and pesticides.
- *Plastics in the Ocean: More than a Litter Problem*. Center for Marine Conservation.
- *The Return of the Brown Pelican*, by J. Brown. Louisiana State University.

Adopt A Water Friend: Group 1 - Temperature

Using a thermometer, measure temperature in the following places:

IN THE WATER

Place the thermometer in water in a sunny spot and in a shady spot.

In the Sun _____

In the Shade _____

IN THE AIR

Hold the thermometer at chest height, away from your body. If it is windy, shield the thermometer from the wind.

In the Sun _____

In the Shade _____

IN THE SOIL

Place the thermometer base gently into the surface of the soil.

In the Sun _____

In the Shade _____

Adopt A Water Friend: Group 2 - Soil Moisture and pH

Collect soil samples in the following places.

Write a description of the soil. Is it like sand, or does it stick together like clay? Is it light brown, reddish or dark brown? Does it have a smell? Use other words to describe the soil.

At the water's edge:

5 feet away from the water in the sun:

5 feet away from the water in the shade:

Use pH paper to determine the pH of the water and of the soil:

pH of water: _____

pH of damp soil: _____

Adopt A Water Friend: Group 3 - Plants

Describe the plants at water's edge. Are there plants in the water? What do they look like? Are they mostly flowering plants, grasses, trees or shrubs? If you know what types of plants they are, write down their names. Use a field guide to identify as many plants as you can.

Describe the plants that are closest to the water but not in the water. Are they trees, grasses, shrubs or small flowers? How tall are they? Use the tape measure to measure their height, or estimate their height by comparing the height of the plants to a person. Describe one here or draw a picture of it.

Use the tape measure to get 10 feet away from the water. Describe the plants here. Are they the same as the ones at the water's edge? Describe them or draw a picture of them.

Adopt A Water Friend: Group 4 - Animals

Are there animals in the water? What are they? Fish, insects, frogs or toads are common water animals. Describe a water animal here. Draw a picture of it below.

Keep a list of all the animals that your class sees on the field trip. You should be able to find at least five animals, and probably more. Look for birds, insects, squirrels, frogs; lizards, turtles or other animals. If you have a field guide, try to identify the animals. Write down animal tracks, too.

Adopt A Water Friend: Group 5 - Human Impact

Take "before" photographs of the site.

Write down your group's first impression of the area. Is it dirty? Is there a lot of litter and garbage around? Or is the site clean?

Record all evidence of humans here. Include graffiti, tire tracks and all pieces of litter that you find.

After your class has cleaned up the area, take an "after" photograph of the site. Write your impressions in a log that the teacher can keep from year to year.