Measuring Water Quality with Macros (Learning Experience #2)
Student Procedures

Lesson Essential Question

- What can we learn about the quality of water in an aquatic habitat from the organisms that live there?

Procedure

1. Your project team will be working together to conduct a survey of the macroinvertebrates that live in the aquatic habitat of your study area. Each team member should have a responsibility such as collector, recorder, or communicator.

2. Discuss the lesson essential question with your team and write a preliminary answer in your journal. At the end of this learning experience you will return to this question to change or add to your original answer.

3. Scientists say that healthy streams and wetlands support diverse populations of plants and animals, both microscopic and those that are large enough to be seen with the naked eye. They sample the numbers and kinds of animals living inan aquatic habitat as one indicator of the quality of the water. The greater the diversity of animals in the site, the healthier the habitat is considered to be. Make a prediction about the number and variety of organisms that you will find, based on your prior observations of your study area. Record your prediction and the reasoning behind it in your journal.

4. Before going to your sampling site, work with your team to suggest rules for visiting field habitats and handling the animals that you find there. Share your ideas with your class and record them in your journal.

5. Each team will go to the sampling site with these materials: one each of a bucket or tub, small clear cup, macroinvertebrate identification key, sampling net, forceps (optional), journal or notebook, *Is Anybody There* (Student Sheet #1), and white egg carton for sorting samples.

6. Before anyone wades into the water to collect animals, begin your exploration by describing the condition of the water: Is it clear or cloudy? Does it have a color? Is it cool or warm? Does it have an odor? Do you see any plants or animals in the water? Your group's recorder should make note of your team's answers on *Is Anybody There* (Student Sheet #1).

7. Fill your team's bucket or tub with stream or pond water and place it in the shade or some other cool place. Remembering the class sampling rules, the group's collectors will gently pick up animals that they discover on the bottom of the stream, under rocks and swimming free in the water. All samples should be placed in the bucket or tub. As two or three team members explore the site, another will fill the sections of egg cartons with water and carefully place a specimen into each one. The recorder will sketch the specimens and identify them in *Is Anybody There* (Student Sheet #1).

8. Your team will complete the table in the student sheet, including a count of how many of each kind of animal that you found. When you return to your classroom, you will add your information to a data table for the entire class. This will give you a bioassessment for the site(s) that each team visited.

9. Discuss with your team the relative health of your aquatic ecosystem, based on the bioassessment that you just completed. What other variables should be tested to come to a conclusion about the quality of the water in this environment?

10. Answer the following questions on *Planning for Improvement* (Student Sheet #2):
    - What should be done to improve the water quality in your team's project site?
    - Why is clean water important in your community or region?
    - Does the quality of water in your region affect the quality of aquatic ecosystems that are downstream? Explain.