

# Water Worlds

## GENERAL INFORMATION

### THEME

Not all aquatic ecosystems are created equal.

### SUB THEMES

1. Moving water is a challenge for aquatic organisms.
2. Freshwater ecosystems are home to a diverse and complicated food web.

### VOCABULARY

Littoral zone, open-water zone, deep-water zone, biodiversity, ecosystem, macroinvertebrates, microinvertebrates

### ACTIVITY MATERIALS

Viewing trays, sampling nets, magnifying glasses, macro ID cards, micro ID slides, flow meter, thermometers, pH strips, DO test kits, microscopes, blank slides, droppers, sampling stick, sample jars, data sheets, pencils, clip boards

### METHODS

### INTRODUCTION

Introduce yourself and state the title of the activity. Preview the main points of the activity and give students an idea of what they will be doing. Ask: **What types of fresh water ecosystems do you see here on the property** (the pond and creek)? Ask: **What is the main abiotic factor that is different between these two ecosystems?** Explain that water is moving in the creek but it is still in the pond. Explain that moving water usually has a lower but more constant temperature throughout and also contains more oxygen than a pond. Explain that these abiotic factors may affect the types of plants and animals that live there because of the water movement and temperature. Ask: **What types of adaptations do you think would be important to have in the moving water found in a creek? What about the still water found in a pond?** Discuss that moving water adaptations include the following: flattened body shapes to allow organisms to move into small spots between rocks, eggs glued to stones, tiny hooks on legs to hold on to rocks, strong swimmers, and hard bodies to protect against crashing into rocks. Still water adaptations include the following: soft bodies, large size, slow swimmers, more plants because they do not drift, and good diving ability. Ask: **Because the pond and creek are so different, do you think you will find exactly the same producers, consumers, and decomposers in each ecosystem** (there may be some overlap, but there will likely be

## Teacher's Corner

### Grade Level(s)

High School

### State Performance Indicators

#### CLE 3210

- Inq.3: Determine appropriate tools to gather precise and accurate data.
- 2.1: Predict how population changes of organisms at different trophic levels affect an ecosystem.
- 2.2: Interpret the relationship between environmental factors and fluctuations in population size.
- 2.4: Predict how various types of human activities affect the environment.
- 5.1: Compare and contrast the structural, functional, and behavioral adaptations of animals or plants found in different environments.
- 5.2: Recognize the relationship between form and function in living things.

# Water Worlds

## INTRODUCTION (cont.)

different plants and animals fulfilling the roles of producer, consumer, and decomposer.

## ACTIVITY

Explain that the students are going to work in groups to explore each ecosystem to better understand it. One group will assess the pond and the other group will assess the creek. At the end of the activity, everyone will come together to compare results. Briefly explain that students will also be looking for macroinvertebrates and microinvertebrates. Ask: **What are these creatures** (macro means large, micro means microscopic, invertebrates are animals without spines). **Make sure to avoid frog eggs in the spring.** Provide each group of students with data sheets, pencils, and clipboards. Briefly explain how to complete the data sheet. Each ecosystem (pond and creek) will have three stations. Rotate the teams among the following three stations every 7-10 min:

- **Station 1:** Measure physical and chemical properties of pH (measure of the alkalinity or acidity of the water), dissolved oxygen (the amount of oxygen in the water available to aquatic plants and animals, varies with temperature), temperature, and flow, (the amount of water moving), and observations.
- **Station 2:** Measure biological properties of macroinvertebrates.
- **Station 3:** Measure biological properties of microinvertebrates using microscopes.

Bring the group back together for the discussion.

## DISCUSSION

Engage students in a discussion about their results. Have them compare the abiotic and biotic factors between the two ecosystems. What producers, consumers, and decomposers did you find in the pond? What about the creek? What are some of the adaptations we learned about today? Why are these adaptations important? How do you think pollution would impact the living things we found in the pond?

## WRAP-UP

Let the group know that the activity is coming to an end. Conversationally review the theme and sub themes. Collect the data sheets. Encourage students to think about how they can keep aquatic ecosystems clean.

## BRINGING IT TO THE CLASSROOM

Allow students to research the effects of pollution on a pond. One example would be agricultural runoff that leads to eutrophication. Have students write a report or present their findings to the class.

## ACKNOWLEDGEMENTS

- Copyright © 2008 Healing Stones Foundation. All rights reserved.
- Activity developed by Melissa Squirlock; August 2009.
- A Practical Guide for the Amateur Naturalist. Gerald Durrell. Published by Alfred A. Knopf, New York, 1988.
- Life Science. Chapter 20: The Earth's Ecosystems. Published by Holt, Rinehart, and Winston, Austin, 2001.