

Eurasian Watermilfoil

Eurasian watermilfoil activities are directly tied
to the eighth spread - pages 15 and 16 of “Our Wetland Project”.

- What kinds of animals live in water?*
- What animals live on the land around a pond?*
- What animals fly in the air near a pond?*

Students will learn about the diversity of animal life in a pond and the interdependence among pond organisms.

Levels All Grades	Subjects Language Arts, Science, Mathematics
Skills Discussing, Sensory awareness, Active participating, Creating, Observing	
Concepts Scientific investigation using observations, tools Interaction of living things and environments Diversity of life	
Objectives: Students will be able to: Define the characteristics of a pond Illustrate how tolerance to water quality conditions varies among macroinvertebrate organisms Explain how population diversity provides insight into health of an ecosystem	
Time Considerations Preparation - 30 minutes Activity - 70 minutes	
Lesson Overview ● Picture a Pond With Your Ears (20 minutes) ● Macroinvertebrate Mayhem (20 minutes) ● Layers of a Pond Mural (30 minutes)	

Picture a Pond With Your Ears Lesson Details - 20 Minutes

Materials (20 student class-size)
Lingelbach, Jenepher. *Hands-On Nature: Information and Activities for Exploring the Environment with Children*. Woodstock: Vermont Institute of Natural Science, 1986.

Background
A pond can be described as a shallow body of standing water in which enough sunlight reaches the pond to allow rooted plants to grow from shore to shore. Water temperatures are relatively uniform throughout. A pond is small enough so that the wind does not have much impact on any of its shores.

STEP ONE. Upon arrival at the pond, ask students to sit quietly together, close their eyes, and concentrate on listening. Tell students to hold up one finger for each different sound heard. When most of the students have five fingers up, tell them all to open their eyes. Discuss the sounds, identify them if you wish, and why they were or were not typical pond sounds.

Which sound did you like the most? The least?

Macroinvertebrate Mayhem Lesson Details - 20 minutes

Materials (20 student class-size)

Macroinvertebrate Mayhem kit

Project WET: Curriculum and Activity Guide: Project Wet: Bozeman, MT. 2000.
flagging

Background

Explain that a macroinvertebrate is an animal without a backbone living in one stage of its life cycle, usually the nymph or larval stage. Visible without a microscope, macroinvertebrates can spend a few years living in a freshwater habitat. Many are benthic (oceanic or deep sea) organisms, or bottom dwellers.

Eurasian watermilfoil (*Myriophyllum spicatum*) is an attractive plant with feathery underwater foliage. It was once commonly sold as an aquarium plant. Eurasian watermilfoil, hereafter called milfoil, originates from Europe and Asia, but was introduced to North America many years ago and is now found over much of the United States. This plant was introduced to the eastern United States at least as long ago as the 1940s, but it may have arrived as early as the late 1800s. It is very apparent that milfoil has been spread from lake to lake on boat trailers.

Growth Habit

Because it is widely distributed and difficult to control, milfoil is considered to be a very problematic plant. The introduction of milfoil can drastically alter a water body's ecology. Milfoil forms very dense mats of vegetation on the surface of the water. These mats interfere with recreational activities such as swimming, fishing, water skiing, and boating. The sheer mass of plants can cause flooding and the stagnant mats can create good habitat for mosquitoes. Milfoil mats can rob oxygen from the water by preventing the wind from mixing the oxygenated surface waters to deeper water. The dense mats of vegetation can also increase the sedimentation rate by trapping sediments.

Milfoil also starts spring growth sooner than native aquatic plants and can shade out these beneficial plants. When milfoil invades new territory, species diversity of aquatic plants typically declines. Although some species of waterfowl will eat milfoil, it is not considered to be a good food source. Milfoil reproduces extremely rapidly and can infest an entire lake within two years of introduction to the system.

STEP ONE. Flag the playing area boundaries before the lesson.

STEP TWO. Tell students they are going to play a game that stimulates changes in a pond when an environmental stressor, Eurasian watermilfoil, is introduced. Show students the playing field and indicate the boundaries.

STEP THREE. Split students into teams. Have one student volunteer to be an environmental stressor, Eurasian watermilfoil. Discuss the ways that a pond can become infested with Eurasian Watermilfoil and how this can alter pond conditions. (*With a large class or playing field, more students will need to be stressors.*) Divide the rest of the class into seven groups to play the game. Each group represents one type of macroinvertebrate species listed in Macroinvertebrate Groups. Record the number of members in each group, using a table. (*Try to have at least four students in each group. For smaller classes, reduce the number of groups.*)

- Caddisfly larva
- Mayfly nymph
- Stonefly nymph
- Eurasian Watermilfoil

Macroinvertebrate Mayhem Lesson Details - 20 minutes (continued)

STEP FOUR. Set-up the game. Distribute appropriate identification labels to all group members. The picture of each group’s macroinvertebrate should face outward when labels are attached. Inform students that some macroinvertebrates have hindrances to crossing the field.

Intolerant macroinvertebrates and Hindrances		
Organism	Hindrance	Rational for Hindrance
Caddisfly	Must place both feet in a bag* and hop across the field, oxygen stopping to gasp for breath every five hops.	Caddisflies are intolerant of low levels.
Stonefly	Must do a push-up every ten steps.	When oxygen levels drop, stoneflies undulate their abdomens to increase the flow of water over their bodies.
Mayfly	Must flap arms and spin in circles when crossing field.	Mayflies often increase oxygen absorption by moving gills.

*Caddisfly larvae build cases and attach themselves to rocks for protection and stabilization.

STEP FIVE. Assemble the macroinvertebrate groups at one end of the playing field and the environmental stressor(s) at midfield. When a round starts, macroinvertebrates will move toward the opposite end of the field and the stressor will try to tag them. To “survive”, the macroinvertebrates must reach the opposite end of the field without being tagged by the environmental stressor. The environmental stressor can try to tag any of the macroinvertebrates, but will find it easier to catch those with hindered movements. When tagged, the macroinvertebrate becomes a Eurasian Watermilfoil and must remain “planted” where tagged. They may tag other macros but must not move their feet.

STEP SIX. Discuss how long it takes for the pond to become choked with Milfoil and what happened to the macroinvertebrates that live there.

Layers of a Pond Mural - 30 minutes

Materials (20 student class-size)
Large pieces of drawing paper (1 per student)
crayons or colored pencils or markers
tape
glue and/or Mod Podge

STEP ONE. Assign each student to one of the four pond habitats: open water, water’s edge, surface film and bottom. Each student will create an individual mural including the plant and animal life in each of the four habitats of a pond. Have them collect natural items to attach to their illustrations using glue or Mod Podge. Then have them combine their individual illustrations to create a complete mural of a pond that includes plant and animal life from each pond habitat. Tape the items together.