



Life in a Pond

ALABAMA OUTDOOR CLASSROOM ACTIVITY

Grade Levels

K-5

Overview

Observe a local pond or aquatic ecosystem, and study the wildlife that utilizes the pond/aquatic ecosystem for its habitat needs.

Subject Areas

Science, Language Arts & Art,

Duration

30-45 minutes

Learning Objectives

Students will (1) discuss a pond ecosystem, (2) describe a wild animal that utilizes the pond/aquatic ecosystem as part of their habitat, and (3) determine where the animal finds its other habitat needs including food, shelter, and places to raise young.

AL Course of Study Objectives

Correlations for Science

Kindergarten: 1, 2, 3, 6, & 7

First: 1, 2, 4, 7, & 8

Second: 1, 4, 5, 6 & 9

Third: 1, 2, 3, 8 & 10

Fourth: 3, 5, 6 & 7

Fifth: 4 & 9

Outdoor Classroom

Connection

Students observe and analyze the aquatic study area in the outdoor classroom site.

Materials

- Clipboards (1 per student)
- Pencils (1 per student)
- Crayons or Colored Pencils
- Copies of "Life in a Pond" Activity Sheets (1 per student)
- Field guides (*listed on page 2*)

Background Info

A pond is characterized as being a small body of water that is shallow enough for sunlight to reach the bottom, permitting the growth of rooted plants at its deepest point. Seldom do ponds reach more than 12 to 15 feet (3.6-4.5 meters) in depth.

Even though at first a pond will appear to be lifeless, microscopic plankton will form drifting masses; water boatmen and winged whirligig beetles will alight on the surface to swim; and plants will colonize the pond and provide food and shelter to a wide variety of animals.

Ponds are considered to be part of the freshwater habitat-which are divided into flowing water and standing water. The standing water habitat are divided into lakes, ponds, and swamps. Ponds can be even further divided into those with bare bottoms and those whose bottom contain vegetation.

Ponds are noted for their abundant and rich varieties of plant and animal life, which all are maintained in a delicate ecological balance. Life forms range from microscopic bacteria to insects, fish, small animals, and birds.

The place where an organism lives is considered its habitat. Four distinctive habitats can be found within the pond community. These four habitats are the surface film habitat, open water habitat, bottom habitat and the shore habitat.

The surface film habitat is located on the top (surface) of the pond water. It is the habitat of air-breathing floating animals (insects) such as marsh treaders, broad-shouldered water striders, and animals that have special devices that allow them to walk on the surface of water without breaking through such as water striders. Some insects and free-floating animals are adapted to live only on the upper side of the surface film. The animals that dwells on the surface usually feed on the floating plants, insects and other animals that may have been killed or drown and floated to the surface. The surface dwelling animals may even feed on one another. Other animals, along with the larvae of some beetles and flies spend much of their life on the underside of the film beneath the floating plants.

The open-water area mainly consist of the water surrounded by plant life. It ends where vegetation is dense and rooted into the soil. The open water habitat is composed of large, free-swimming organism such as fish, and small microscopic plants and animals called plankton that drift suspended in the water. Phytoplankton (small suspended plants), mostly consisting of algae, are the basic food in lakes. Small suspended animals such as tiny crustaceans, insect larvae, rotifers, and other invertebrates called zooplankton also live in the open-water habitat and are basic food for pond animals. The availability of plankton vary from season to season, but are most abundant during the spring. Other animals such as turtles, birds and larger fish comes to the open-water area for food. Some insects, insect larvae, and crustaceans migrate from the bottom towards the surface, but return to the bottom as daylight appears.



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Outdoor Classroom Connection

Students observe and analyze the aquatic study area in the outdoor classroom site.

Literature Connections

⇒ *All Eyes on the Pond* by Michael Rosen (ISBN-10: 1562824759)

⇒ *Pond* by Donald Silver and Patricia Wynne (ISBN-10: 0070579326)

Field Guides

⇒ *National Audubon Society Field Guide to Southeast United States* (ISBN-10: 0679446834)

⇒ *A Guide to Common Freshwater Invertebrates of North America* by J. Reese Foshell, Jr. (ISBN-10: 9780939923878)

Other Related Conservation Education Activities

Discovering Alabama Video

⇒ *Alabama Rivers*

⇒ *Alabama Wetlands*

⇒ *Cababa Creek Watershed*

⇒ *Bear Creek Watershed*

⇒ *Waters to the Sea: Discovering Alabama Interactive DVD Rom*

Life in the bottom habitat of a pond depends upon the type of bottom a pond may have. For example, if the pond is shallow and has a sandy bottom it could be inhabited by sponges, earthworms, snails and insects. The bottom of quiet, standing water ponds are characterized as muddy or silty, and life represented in these types of ponds are crayfish, and the nymphs of mayflies, dragonflies, and microorganisms. These animals usually burrow into the bottom muds.

If the water in the pond is turbid, conditions at the bottom is extremely different from that in the opened waters because light does not penetrate to the bottom and plants cannot grow. Due to the lack of vegetation, the availability of shelter for animals is almost null. The amount of dissolved oxygen will be low, and the concentration of carbon dioxide will be high. Despite all of the previously mentioned conditions, animals such as earthworms, small clams, and fly larvae such as bloodworms and phantoms can survive in the deep bottom zone. There is usually a large amount of bacteria in this zone because they can survive off of dead organic matter.

The littoral habitat extends from the waters edge outward as far as rooted plants grow. This is the richest area in the pond community because of the plant life that exist in this area. The observer will find unlimited amounts of biotic life. Typically, there are three distinct borders of flowering plants that makes up the littoral habitat: the emergent plant zone; floating plant zone; and submersed plant zone. If the shore is rocky, plants may not grow in this area. Therefore, some ponds may have two distinct borders of flowering plants.

The emergent plant zone is closest to the shore. The observer will find plants that are rooted to the bottom. Their stems and leaves appear above the surface. The emergent zone should be bountiful with grasses, sedges, rushes, and algae. Along with the plant life, the observer will find animals such as protozoans, worms, insects, snails, and small fishes.

The floating-leaf plant zone is made up of broad, flat-leaved water lilies, water ferns, and duckweed. If the observer picks up one of the leaves, animals such as snails, bugs, and mayflies, larvae and eggs may be located underneath them. A variety of algae can be found in this zone. Most water animals use this area for breeding and nesting.

The submersed plant zone is the area of vegetation that surrounds the center of the pond. The plants in this area all have leaves that are long and slender, or bushy and branched leaves. Pondweed, waterweeds, and hornwarts are some of the flowering plants found in this zone. The flowers of these plants are pollinated above the water surface. The seeds of these plants germinate and the plants develop underneath the water.

An ecosystem is a community of plants, animals and smaller organisms that live, feed, reproduce and interact in the same area or environment .



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Ecosystems have living and nonliving parts. The non-living or abiotic substances that make up the pond includes basic inorganic and organic substances such as water, carbon dioxide, oxygen, phosphorus salts, amino acids and nitrogen. Small portions of the necessary nutrients that organisms need in order to survive in the water is always available. The rate at which these nutrients are released into the water are regulated by the temperature cycle (seasons), the amount and availability of sunlight, and the climatic regimes.

The living, or biotic part, of an ecosystem is known as the ecological community. Living things interact with each other by feeding on one another. The biotic organisms include phytoplankton (small/microscopic floating plants like algae), rooted and floating plants, fish, crustaceans, insect larvae, and amphibian larvae. Therefore, energy, compounds, and chemical elements are transferred from creature to creature along the food chains.

This Pond Ecology Information was written by Joe Lewis, Yale, New Haven Teachers Institute, and can be found at <http://www.yale.edu/ynhti/curriculum/units/1992/5/92.05.07.x.html#i>.

Procedure

1. Tell the students that we are going to talk about an Aquatic Ecosystem. Ask the students a series of questions to begin the discussion: Who can tell me what an ecosystem is? What is an aquatic ecosystem? Is the aquatic ecosystem in our outdoor classroom (or on our campus) a creek, lake, river, pond or ocean? Does it have salt water or freshwater? Our aquatic ecosystem is a community of plants and animals that live and interact together in a freshwater pond.
2. Discuss how your pond provides habitat for wildlife. Ask the students another series of questions: What does the word habitat mean? What do animals need in their habitat to survive? What do we need to survive?
3. What animals do you think might use our pond for their habitat? Discuss all types of animals including fish, amphibians, reptiles, birds, mammals and insects.
4. Use the Life in a Pond worksheets: Choose the animal that you would like to see in your outdoor classroom, and determine if your outdoor classroom has all of the food, water, shelter & places to raise young for this specific species of wildlife.

The Alabama Outdoor Classroom Program is a partnership between:



Alabama Cooperative
Extension System



Alabama Wildlife Federation

www.alabamawildlife.org/classrooms/



Alabama Department of
Conservation & Natural Resources



Life in a Pond

OUTDOOR CLASSROOM ACTIVITY SHEET (PG 1 OF 2)

Name: _____ Date: _____

Name a type of WILDLIFE that you would like to use the pond in your outdoor classroom for part of its HABITAT: _____

Basic Description

What color is it? _____ How big is it? _____

Does it have ___ Fur ___ Feathers ___ Scales ___ Soft Skin ___ Rough Skin ___ Wings?

Is it a ___ Bird ___ Mammal ___ Reptile ___ Amphibian ___ Insect ?

Draw a picture of this animal.



Life in a Pond

OUTDOOR CLASSROOM ACTIVITY SHEET (PAGE 2 OF 2)

Name of WILDLIFE: _____

What HABITAT does it need including food, water, shelter and places to raise young?

<p>Draw and label a picture of the FOOD it would eat. (like berries on a bush)</p> <p>Does your outdoor classroom already have this? _____</p>	<p>Draw and label a picture of where it would DRINK WATER. (like a bird bath)</p> <p>Does your outdoor classroom already have this? _____</p>
<p>Draw and label a picture of its SHELTER. (like a bush with leaves)</p> <p>Does your outdoor classroom already have this? _____</p>	<p>Draw and label a picture of where it would RAISE ITS YOUNG. (like a bird's nest)</p> <p>Does your outdoor classroom already have this? _____</p>

Have you seen this animal around your school? ___ Yes ___ No

If so, where did you see it? _____