



*Western Upper Peninsula Center
for Science, Mathematics and Environmental Education*

A partnership of

Copper Country & Gogebic-Ontonagon Intermediate School Districts and Michigan Technological University
Serving schools and communities in Houghton, Baraga, Gogebic, Ontonagon and Keweenaw Counties

Discovering Ponds

Duration: 1-2 hours

Grade: 6

Summary: Students will learn how ponds are characterized by biological factors. They will then sample ponds for aquatic insects.

Objectives

Students will:

1. Describe pond biology features.
2. Identify various aquatic insects.

Materials:

- Pond Sampling box
- Boots
- Aquatic ID sheets (in pond box)
- Macroinvertebrate Field trip box (Presto-Chango cards inside)

Background Information:

What is a pond?

Ponds are bodies of water less than 20 acres in size and do not dry up during the summer months. A pond is usually made of still water with a strong film on top of the water. This film helps support aquatic insects movement and metamorphosis. The bottom of ponds usually consist of mud.

What are some physical characteristics of ponds?

Emergent plants. These plants "emerge," or rise up, out of the water. Roots of emergent plants are in the mud bottom, underwater, near the edge of the pond. Leaves and flowers are above the water's surface. Examples of emergent plants include cattails, sedges, bulrushes, reeds, and arrowheads. Emergent plants provide important shelter for pond animals, such as frogs, snakes, and muskrats.

Floating Plants: These plants float on the surface film of the water. Some, the duckweeds, float freely, with tiny roots dropping down into the water. Others, like lily pads, have wide leaves that float on the surface and long stems that reach all the way down to the pond bottom where roots lay in the mud. Lilies grow in huge colonies and can sometimes cover the entire surface of a pond. Floating plants provide cover for fish and other underwater creatures.

Submergent Plants: These plants spend their entire lives underwater. Bladderworts and horntails are examples. Submergent plants provide structure for aquatic insects to climb on and food for animals, such as ducks and snails.

Aquatic Insects: These are insects that lay their eggs in water. Eggs hatch into a nymph stage underwater and most of the insects' lives are spent there. Some aquatic insects prefer streams, but most can be found in ponds. When the nymphs are ready to change into adults, they swim or float to the surface film, where they metamorphosize into the form of insects you are most familiar with. Dragonflies, mosquitoes, mayflies, water striders, diving beetles, crane flies, and whirligigs are some examples of aquatic insects.

- Explain that most insects are invertebrates. Ask them “what is the difference between invertebrates and vertebrates?” Invertebrates unlike humans, snakes and fish, don’t have a backbone or an internal skeleton to support their bodies. Instead of a skeleton, invertebrates may have a hardened body or a protective shell. Other invertebrates have soft bodies, such as grubs and worms.
- What is metamorphosis?. What is incomplete (simple) metamorphosis, what is complete metamorphosis? Incomplete= egg, nymph and adult. Complete= egg, larva, pupa and adult. Many aquatic insects lay their eggs in the water. Most aquatic insects found in the water are in the nymph or in the pupa stage. Once they are adults, many insects leave the water. Some stay like the water strider.

Presto-Chango Game

Give each student a card to hand around their necks. Explain that one has the immature (larva) stage and you need to find your match in the adult stage. Tell them the pattern on the side of the card helps identify your match. Give them 5 minutes to find their match. Once they have tell them that we are now going to look for the real insects at the pond.

Pond/Wetland Sampling Activity

Today, we are going to be pond scientists. What is a scientist (someone who asks questions and investigates to find answers). What do scientists use to study? They have special tools (sampling equipment - nets, magnifying glasses) and they look in books (field guides) to find out more about what they find.

Working in teams of two, lets find out what lives in this pond/wetland. Each team will get a net or scoop, and a tub/container to hold water. After 20 minutes of sampling, each student describes one organism/critter that they found.

Summarize

Rephrase objectives as questions.