WETLAND STUDY

Third Grade - Rahr Memorial School Forest

ENDURING UNDERSTANDING

Wetlands are complex, valuable natural resources that need proper care.

ASSESSMENT

Students will be able to demonstrate their understanding by listing types of wetlands, describing the importance of wetlands, discussing how humans can help or hinder wetland areas, and respectfully observing aquatic life.

WISCONSIN STATE ACADEMIC STANDARDS

Science: A.4.1, A.4.2, A.4.5, B.4.1, C.4.1, C.4.2, C.4.4, C.4.5, F.4.2, F.4.4, H.4.2, H.4.4
Social Studies: A.4.4, A.4.9
Environmental Education: A.4.1, A.4.2, A.4.3, B.4.4, B.4.12, C.4.1, D.4.1, D.4.5

CLASS OUTLINE

MATERIALS

- "Around the Pond: Who's Been Here?" storybook

Wetland Metaphors

- Mystery Metaphor Box
- Sponge
- Pillow
- Egg beater
- Cradle
- Strainer
- Coffee filter
- Antacid
- Cereal
- Rice
- Photo of garden
- Soap
- Picture of zoo
- Picture of resort or motel

Swamp Critters

- aquatic nets
- collecting bins
- i.d. sheets
- clipboards
- ice cube trays
- ladles
- spoons

Water and Wetlands

- modeling clay
- shallow pan
- sponges
- watering can
- cup of soil
- jar of muddy water
- paperclips
- liquid detergent
- pail with water
- pan
- cotton swabs

Wetland Plants

- Trees of WI field guides
- Photos of wetland plants

CLASS PROCEDURES

I. Set-up

After setting up a date with the School Forest Coordinator, teachers are also responsible for filling out and turning in a field trip request form. Teachers should also schedule a time when the School Forest Coordinator can meet with them at school to discuss the visit. Teachers will be asked to teach or co-teach

one of the activities while the student groups rotate through the activities during the day. The School Forest Coordinator can also teach at one of the stations during the day if available. Preparation time will be needed to review the activity.

All of the materials for this day can be set-up at the School Forest. Please notify the School Forest Coordinator of your class needs. Teachers will need to bring a few things from school: first aid kits, emergency contact information, extra clothing, and any additional activities they feel necessary for the class. Students will need to bring a bag lunch (with a drink and nothing that needs a microwave) and adequate clothing for the day.

II. Sample Schedule:

9:00	Depart from school
9:30	Arrive at School Forest
9:30 – 9:50	Welcome and Introduction
9:50 – 10:45	rotation 1
10:50 – 11:45	rotation 2
11:45- 12:20	Lunch
12:20- 1:15	rotation 3
1:20 – 2:10	rotation 4
2:15 – 2:25	Conclusion
2:30	Depart from school forest
3:00	Arrive at school

III. Introduction

During this day at the School Forest, students will become scientists and study a very interesting ecosystem. We will be learning about wetlands through games and experiments. Students should remember to remain respectful of nature, each other, the teachers, and the equipment. If there is time, read "Around the Pond: Who's Been Here?"

IV. Wetlands

Walk your class to the edge of the swamp on Hemlock Trail. Find a spot to sit in a circle. Point out the swamp and discuss why wetlands are incredible places. Use the materials given to: describe characteristics of wetlands, identify functions of a wetland, and help the students better appreciate the importance of wetlands to wildlife and humans. Break the class into smaller groups. Have each group select an object from the Mystery Metaphor Box. Each group should now discuss how they think their selected object is a metaphor for a wetland. Have each group present their object and what they think it represents.

Object	**Metaphoric Function**
Sponge	Absorbs excess water caused by runoff; retains moisture for a time even if standing water dries up (sponge stays wet even after it has absorbed a spill)
Pillow	A resting place for migratory birds
Egg beater	Mixes nutrients and oxygen into the water
Cradle	Provides a nursery that shelters, protects, and feeds young wildlife
Strainer	Strains silt and debris from water (keeps water supply clean)
Coffee filter	Filters smaller impurities from water (excess nutrients, toxins)
Antacid	Neutralizes toxic substances
Cereal, rice, photo of garden	Provides nutrient-rich food for wildlife and humans
Soap	Helps cleanse the environment
Picture of zoo	Habitat for diverse wildlife
Picture of resort or motel	Resting or wintering place for migrating waterfowl

There are many different kinds of wetlands. Name a few as a class. (Bogs, ponds, marshes, ephemeral (seasonal) pools, lakes, oceans, Tide pools, streams, rivers, and swamps.) At the School Forest there are a few different kinds of wetlands. Which kind are we at right now? This is a swamp because it is a wetland that has trees in it. Other kinds of wetlands may have some trees but swamps have many trees. Can the class name any other types of wetlands at the School Forest? How are they similar to each other? How are they different from each other?

V. Wetland critters

Take your class to the swamp dock (north of Hemlock Trail and west of the dunes). Bring the supplies with you. Gather the group at the end of the dock and review what you will be doing and the rules.

In this session, students will become field scientists. They will collect and study the animals that live in the swamp. The class will observe any large animals that may come by (ducks, deer, etc.) but will more closely be looking at the smaller animals (insects, amphibians, etc.). Divide the class into small groups of about 3-5 students. Assign each group an area to work. Then pass out the materials. Students should:

1. Fill the bins with about 1 inch of water.
2. Carefully scoop up water (and critters) with net and dump it into the bin of water. It is best to turn the net upside-down and "swish" it is the bin so that the tiny critters swim into the bin.
3. Study what is found.

Note: Amphibians have permeable skin. If students have insect repellant or sun block (or anything else) on their hands, they should NOT pick up any amphibians. If they do, the animal may become injured because whatever is on the student's hands could go through the animal's skin and into its body.

The teacher may want to collect the nets at some point so that the students will focus on the critters that they have already found. You can use the containers with lids for any frogs or other animals that you want to show all of the students.

Near the end of the class, gather everyone to discuss what was found. Were there many different kinds of animals? What animal did we find the most of? Some animals can help us determine if a wetland is healthy. The School Forest swamp is monitored every year by the high school biology classes and they have found the critters that indicate a healthy environment. But that can change at any time. How can humans help or hinder the health of wetlands?

VI. Water and Wetlands

This class can be done inside or outside near the buildings.

A. Wetland in a pan

Review with the students what they have learned about wetlands and their functional values. Discuss what the main component to making a wetland is (water).

Present the wetland model and point out its features. Explain that wetlands, like all habitats, are very complicated natural systems. They perform some very important functions such as filtering pollutants, reducing flood damage, and preventing soil erosion. Some wetlands, at times, recharge underground water supplies.

What if we make it rain on the model wetland? Where will the water go? Fit the sponge into the wetland area, slowly sprinkle some water on the land above the sponge, and let the students observe and describe what is happening. Some of the water is slowed down by the

wetland (sponge). The excess slowly flows into the body of water. You may pick up the sponge and squeeze out the water it has absorbed.

Now, ask the students what they think would happen if the wetland was removed? Remove the sponge and sprinkle water on the land again. Note the differences (the water should fill the body of water more quickly and may eventually overflow and flood the land area). What would happen if there were houses right next to the body of water? Many times wetlands are drained and filled in, and house or marinas are built along the water.

For the next part of the experiment, place the sponge back in the pan and cover the clay with a layer of soil. This soil represents pollutants that we use on our lawns and farm fields. Ask the students to predict what will happen to the bare soil when it rains. Now, make it rain on the ground above the wetland. Observe what happens. Compare the water that ends up in the body of water to the muddy water in the jar. Explain that the soil particles were trapped by the sponge (wetland). Try this experiment again without the wetland. Without a wetland, the excess water, soil, and pollutants can end up in the lakes and rivers.

Wrap up this session by discussing what the students learned. Also you may want to discuss: how might the muddy water affect fish, how would boats and ships be affected by the muddy water, how might birds, plants, and other animals be affected by the muddy water, or how can we prevent the runoff?

B. Water ways

This experiment introduces students to the idea of surface water tension. It shows them how some water critters are able to "walk on water." It also demonstrates what can happen to the water tension (and the critters) if certain things are added to the water system.

Procedure:

1. Use a container that is clean and completely free of soap. Fill it 3/4 full of water. Bend the center of a paper clip out to form a cradle.
2. Use the cradle to lower the other clip very slowly onto the surface of the water. Keep trying to get the paper clip to float.
3. Look carefully at the floating paper clip from the top and side. Discuss how the water tension holds the paper clip. This is just like how a water strider or other critter that lives on top of the water does it.
4. Use the end of a toothpick to add some alcohol near the floating paper clip.
5. Use another toothpick to place one drop of liquid detergent on the water's surface near the paper clip.

Why does the paper clip float?

Describe what the paper clip looks like as it floats.

What happens when you add alcohol to the water's surface?

What happens when you add liquid detergent to the water?

What can we learn from this activity?

VII. Wetland plants

In this session, students will learn how plants live in wet areas and what types of trees we have in the swamp area at the School Forest. You may take the students off the trail along the edge of the swamp or down the trail to the pond which travels through the center of the swamp.

Look for clues that the plants live in a wetland. Think about what a plant needs to survive and how it might be adapted to get what it needs in a wetland. Here are a few things to look for:

- "knees" in a tree's root system that jut out of the ground and extend about the high water mark, where they may take in oxygen
- shallow or exposed roots that pick up oxygen from the surface
- plants with hollow tubes that transport oxygen to the roots (reeds, grasses, sedges)
- buoyant, floating plants with root systems that dangle in the water (duckweed- the tiny round plants in the water)
- swollen tree trunks that are usually thickened to the height of the deepest water level

Look at the different types of trees that live in and around the wetland. These trees have specific needs of water. They like much more water than other trees. Find a tree to study. Use the tree field guides to figure out what kind of tree it is (don't worry about getting it exactly correct, the point is to have the students use the field guides). If you are using the "Trees of Wisconsin" by Stan Tekiela books, use the first page (and pages vi and vii) to determine the leaf types and then the range of pages that you should look in.

Have the students examine the bark and the leaves to determine the species. They can also read the "habitat" section of the tree pages to figure out if the tree likes wetter areas. In the School Forest swamp, we have mostly alder (page 109), black ash (page 171), paper birch (page 65), yellow birch (page 67), and red maple (page 135). Along the edges of the swamp we also have hemlock (page 11) and balsam fir (page13).

Discuss the different types of plants that you found in the swamp. Are there only trees? Are there any lily pads or other plants you might find in a lake? Every type of wetland has certain plants that like to live there. Imagine what would happen to this area if we drained all of the water out of it.

VIII. Conclusion

Wetlands are important ecosystems that have many interesting components. Ask the students to review and share some of the major ideas and discoveries from the day.

IX. Clean-up

- Return supplies to building
- Take garbage out to dumpster
- Close windows, shut off all lights and water, lock doors, shut driveway gate
- Give the School Forest Coordinator feedback on how to make this trip better in the future.

Safety

While at the School Forest, teachers should carry first aid kits. You can bring these from your school or use the ones at the School Forest. The first aid stations can be found in the Ehlert Lodge office, in the ELC, and the upstairs of the Krejcarek Building. Please report any safety issues to the School Forest Coordinator.

Students should be supervised at all times. If you decide to go off trail, go in a clear area where branches cannot swing back and hit someone. Be aware of the plants you are traveling around so as not to pass by thorn covered plants.

Optional / Rainy Day Activities - These activities can be done if the weather is poor or if there is extra time. Please notify the School Forest coordinator if you plan to teach any of these activities. ***You may want to teach these at school after your School Forest trip as a follow-up.***

Dream a Stream. As a class, imagine and brainstorm ideas about what a stream looks, sounds, and smells like. Sort the children into groups of four or five and give each group a large piece of paper. The students should use the paper to create mural of a stream habitat. Afterwards, join the different sections and discuss.

Create an aquatic insect. Have each student use the provided materials (pipe cleaners, clay, egg cartons, markers, paper, toothpicks, and foil) to create an aquatic insect. Ask them to determine if their insect would live on top of, in the middle, or at the bottom of the wetland.

Additional Information

See the following pages for more information about wetlands.

Resources

Slattery, Britt Eckhardt. WOW! The Wonders of Wetlands. Environmental Concern Inc. and The Watercourse. 2003.

Tekiela, Stan. Trees of Wisconsin field guide. Adventure Publications. Cambridge, MN 2002.

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