Chapter 4 - Wetland Treasures - *Seaway Trail Wildguide*
Lesson #1 Swamps and Bogs
Grade: 4 – 6
Subject: Science
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Anticipatory Set:

What is a wetland? What is the difference between a swamp and a bog?

NYS Learning Standards:
Mathematics, Science, and Technology Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science.

Objectives:

Students will know what the definition of a wetland is and the difference between a bog and a swamp. The students will watch a film and create a chart on wetlands. The students will complete a fill-in worksheet on the material covered. Students will write a letter to someone they know explaining to the person the importance of preserving our wetlands.

Purpose:

To have students become aware of the importance of wetlands and why we need to preserve them.

Summary: What is a Wetland?

A wetland is an area in which the ground is saturated with or covered by water for most of the year. This covers streams, ponds, lakes, swamps, and bogs. In the past wetlands were considered as wasteland with little value. They have been ditched, drained and filled in to make way for roads, housing projects or shopping centers. Since the early colonist time to the mid 1970's about one half or more of the wetlands in the United States are gone. Since the mid seventies the Federal and states have set laws to slow down, but not stop, the destruction of the wetlands. In New York State Act of 1975 any wetland that is twelve acres or more cannot be filled, drained or altered without approval of the department of Environmental Conversation.

There are several valuable reasons to keep the wetlands. One value is the wetland's role in flood prevention. The wetlands are land with depressions that act as a catch basin in times of heavy precipitation. Wetlands that run along a stream can help make flooding less severe during times of heavy precipitation. Wetlands also act as a reservoir for the underground water supply. During low rainfall periods when the ground water level drops the water from the wetlands filter through the ground and reduce the amount of the drop in the ground water levels. The most important value the wetland has to offer is the unique environmental conditions it gives living things. Many of the species of plants, birds, mammals and reptiles habitat have the threat of destruction. Of all of the endangered or threaten species in the United States they are associated to the wetlands.

1. Plants 30%
2. Mammals 15%
3. Birds 31%
4. Reptiles 31%

There are two types of wetlands, swamps and bogs.

Swamps: Are wetlands that have a stream flowing through or are drained by a stream and the swamps are flushed annually by high waters. The swamp has mineral soil as a base with an underlying base of substrate. Woody swamps are most common along the Seaway Trail. Marshes are made up of herbaceous plants.

Bogs: Bogs are formed mostly in depressions that have no outlet and thus they do not drain. The entire Seaway Trail in Pennsylvania and New York was under a mile high sheet of ice 15,000 years ago. As the glacier retreated large chunks of ice was buried by glacier debris. As the chunks of ice melted depressions formed and many of them filled up with water, forming lakes and ponds. Sphagnum moss and other herbaceous plant grew around these bodies of water. With ideal conditions these plants began to creep out into the water. As the growth continued for thousands of years the open water disappeared forming bogs. The water level is near the surface, so if you stepped on the bog it causes a wave of motion that causes plants to vibrate. In the bog the oxygen level is low this prevents the growth of bacteria and fungi of decay. This produces a very acid environment. This gives the bogs a great preservative quality with little decomposition of the plant materials. In the bogs there are plants that capture and digest insects.

Swamps and bogs both developmental stages started in open waters. Most ecologists believe that if swamps and bogs were left alone to natural forces they would eventually become forests. Trees in these conditions have shallow roots that could be toppled over with strong winds. In a bog that has a series of wet years the trees will die, you can see a number of dead trees in a bog. If the water level drops in a bog you can harvest dried peat from it. Peat moss is great for the production of crops such as celery, lettuce and onions. Western and Central New York contains more peat bogs than any other area of comparable size in the United States. Along the Seaway Trail in Central New York State have been removed and drainage ditches have been dug to create muck farms.

Plants: Swamps

In the swamps there are floating plants. The floating plants are broke down into two different types. One type is the free-floating plant like the duckweeds and the mosquito fern. The duckweed grows on quiet waters and is eaten by ducks and other waterfowl. Muskrats and painted turtles also eat the duckweed. The other type is a plant that is attached to the bottom by a long stem. These types are the American lotus, Watershield, Spatterdock and the Water lily.

Submergent plants – Are plants that grow beneath the water's surface and are attached by roots to the bottom. They have very thin or finely dissected leaves. The plants die and settle to the bottom and over time these deposits along with sediments washed in by streams and run offs will fill the basin. Some of these plants are the elodea, water milfoil, hornwort, ell grass, and curly pondweed.

Emergent plants – As organic and mineral sediments are added to the bottom the water depth decreases. Plants become established by rooting at the bottom of the pond.

The stems and leaves protrude from the surface of the water. Some of these plants are pickerelweed, swamp loosestrife, arrow arum, cattail, purple loosestrife and arrowhead. As the bottom continues to build and the water depth decreases woody plants eventually will grow. Some of these plants are pussywillows, speckled alder, red osier dogwood and buttonbush. These plants start at the margin of the water and extend inward on the areas where the water is the shallowest.

Plants: Bogs

In the bog the growth of spaghnum moss liberates weak acids, which accumulates during the development of a bog until it becomes a very acid environment. This and low oxygen content prevent growth of bacteria and fungi of decay. In the bog habitat where decomposition is very low there is also a shortage of nitrates and other mineral nutrients as well. Because of the lack of nutrients there are some plants found in a bog that are insect-trapping plants. These plants get their nutrition by capturing and digesting small insects. The pitcher plant and the round-leaved sundew plants are such plants that digest insects. Other plants you can find in the bog are the grass pink, large cranberry, moccasin flower, and the rose pogonia.

Low growing plants of the heath family is the chief plant of the bog. These plants grow with their roots in water, but they have the characteristics of plants growing in very dry environments. They show traits for conserving water with waxy coatings, rolled under margins, and scaly, fuzzy, or woolly undercoating. It is believed the plants use these characteristics to conserve water because of low nutrient levels of the bog substrate rather than the high acidity levels found in the bog.

Materials:

1. A film on wetlands
2. Large sheet of paper

Teach:

1. Have the students watch the film on wetlands.
2. Discuss with the class on what they learned from watching the movie on wetlands.
3. Have the students take a sheet of paper and divide it into two parts. Have the students label one side swamp and the other side bog.
4. Teach the students the information on the wetlands and the differences between a swamp and a bog. Have the students record the information about swamps and bogs on the folded sheet.
5. Discuss the importance of preserving our wetlands. Ask the students what they think they can do to help preserve the wetlands.
6. Give the students an assignment where they have to write a letter to someone they know and explain to the person what a wetland is, the difference between a swamp and a bog and why it is important we preserve the wetlands.

Closure:

Why are wetlands so important that we need to preserve them? What is the difference between a swamp and a bog?

Independent Practice:

Have the students complete the fill-in worksheet on wetlands. Have the students complete the letter.

Extended Activities:

1. Have the students research the different plants that are found in swamps and bogs. Have the student find pictures or draw a picture for the plant they do the research on.
2. Take the students for a field trip to a local swamp or bog.

Web sites:

1. http://www.cas.psu.edu/docs/CASDEPT/FOREST/wetlands/manual/chater3.htm
   This is a lesson plan that covers information on wetlands and the different types of animals found in the wetlands.

2. http://www.epa.gov/OWOW/wetlands/science/readlist.html
   This is a great site for a list of books for students to read for different grade levels.

3. http://mbgnet.mobot.org
   This site offers information on freshwater wetlands and the importance in preserving them.

4. http://edtech.kennesaw.edu/web/wet/ands.html
   The site offers some information on wetlands

5. http://www.enchantedlearning.com/biomes/tempdecid/tempdecid.shtml
   The site has a lot of information on the beaver and other animals in a temperate deciduous forest.

Books for children:

1. Life in a Wetland" – Allan Fowler, Linda Cornwell, Janann V. Jenner, Bt Bound, Oct. 2001, ISBN 0613374363 (ages 4-8)
2. "Wetlands" – Darlene R. Stille, Bt Bound, Oct. 2001, ISBN 0613374363 (ages 9-12)
3. "Marshes and Swamps" – Gail Gibbons, Holiday House, Oct 1999, ISBN 0823415155 (ages 4-8)
4. "Swamp" – Donald M. Silver, McGraw-Hill, March 1997, ISBN 0070570261 (ages 4-8)
5. "Wading into Wetlands" – Ranger Rick's Naturescope Series, National Wildlife Federation, McGraw-Hill, March 1997, ASIN 007046507x (ages 4-8)
6. "Leapfrogging Through Wetlands" – Nancy Field, Dog Eared Pub., June 2003, ISBN 0941042189 (ages 9-12)

7. "Discover Nature in Water and Wetlands" – Elizabeth P. Lawlor, Stackpole Books, Jan 2000, ISBN 0811727319, (ages 9-12)
8. "What are Wetlands?" (Science of Living things), Bobbie Kalman, Amanda Bishop, Crabtree Pub, Oct. 2002, ISBN 0865059705, (ages 4-8)
9. "Marsches and Swamps" Lynn M. Stone, Children's, 1983, ISBN 0516016814 (ages 6-9)