

WETLAND WISDOM

NATIVE AMERICAN TRIBES OF WISCONSIN



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I. Enduring Knowledge:

In order to appreciate the impact of human life on the environment, students should know the role of wetlands in supporting many forms of life, as well as understanding the need to protect and preserve it.

Learning Targets:

- Students will be able to define the features of a wetland and the various types of plants and animals it sustains.
- Students will know how wetlands contribute to the well being of the ecology, including reduction of flood damage and the prevention of water pollution in downstream lakes, streams and rivers.
- The students should understand the challenges facing the cultivation and maintenance of wild rice production today.
- Students will know about occupations related to wetland preservation and development.

II. Teacher Background Materials:

Circle of Flight: (“Bizhibayaash”) is a cooperative tribal and inter-tribal program that seeks to improve wetlands and manage waterfowl habitat (and natural wild rice beds) on Indian reservations and treaty-ceded lands in the states of Michigan, Minnesota, and Wisconsin.

Scientists estimate that before European settlers came to Wisconsin, we had 10 million acres of wetlands here. But as people farmed the land and built roads and cities over time, they drained the wetlands. By the time they finally made laws to help protect wetlands, we had lost half of our wetlands. That’s five million acres (almost 8,000 square miles).

Wetlands are important to the ecosystem because they act as buffers between surface runoff and rivers, and reduce flooding peaks by as much as 60 percent. An acre of wetlands can store over one million gallons of floodwater, so they can help save lives and property. They also fight pollution by supplying clean water to our lakes, streams and rivers. When rain and melt waters flow through farms and cities, they can pick up pollution. If those waters flow through a wetland, the wetland naturally filters out most of the pollution. By the time it enters a lake or river, it’s clean. Thus, wetlands are like natural waste treatment plants. Wetlands also support huge numbers of animals and plants.

This program is divided into three parts, which you might use separately or together in your classroom, depending on the amount of time you have for this study. The **first section** of the video is general information about wetlands. The **second section** deals with an example of a wetland management program

on the Lac Court Oreilles Reservation in northwest Wisconsin dealing with turning a cranberry bog into a wild rice bed. (See information provided below related to wild rice.) The **third section** includes using an ecology pyramid model to study various life forms in wetlands, a discussion of invasive species, and also a list of various careers in wetlands science.

Harvesting and processing wild rice:

- Harvesting takes place in a canoe or small boat that can be paddled into a stand of plants. The harvesters bend the ripe grain heads with wooden sticks (called **knockers**) and gently dislodge the seeds into the canoe. (The size of the knockers, as well as other details of the harvest, are prescribed in state and tribal laws. For example, by Minnesota statute, knockers must be *at most* one inch in diameter, 30 inches long and one pound in weight.)
- The seeds (the actual “rice”) are then dried, parched over smoke fires, and the seeds are separated from the **chaff**.
- Wild rice is an ideal food because it is easily stored over long winters and has excellent nutritional value.

Vocabulary:

1. **abiotic**: the non-living parts of the wetland ecosystem, like sunlight, water, air, soil, and nutrients
2. **biotic**: the living parts of the wetland ecosystem, like plants, insects, amphibians, birds, and large predators, like bear
3. **ecosystem**: a biological community of interacting organisms and their physical environment
4. **invasive species**: a plant or animal species that is not naturally found in an ecosystem and tends to dominate that ecosystem until a natural predator is established
5. **Predator**: an animal that naturally preys on others
6. **Wetlands**: land consisting of marshes and swamps; saturated land

Occupations related to wetlands:

1. **wetland ecologist**: scientists who study how all the parts of the wetland ecology interact with each other
2. **aquatic biologist**: scientist who studies the fish and creatures who live in water
3. **botanists**: scientists who study native and non-native (invasive) species of plants
4. **ecologists**: scientists who study and manage all of interrelated parts of the environment and ecosystem
5. **hydrologists**: scientists who study the wetlands water cycle

Occupations related to wetlands continued ...

6. **Resource Managers:** professionals who work to include various natural resources, including wetlands, in land management plans
7. **Water Quality Managers:** those who study and help control how wetlands and other natural land features impact our water quality
8. **Wetland Program Coordinators:** those whose job it is to manage, restore, and protect wetlands, such as people who restore cranberry bogs to wild rice beds, which would have originally been found in the wetlands

III. Before Viewing the Video:

Ask students if they have ever explored a swampy area. If they have, ask them to describe what they found there. Ask them if they think swamps and marshlands are “good” land or not. Have them defend their ideas. Record the ideas for the class to consider after viewing the video.

IV. Viewing Guide:

Have students take notes on the following questions as they watch the video. **Be sure to go over the questions before viewing so the students know what they are listening for in particular.**

- Name some of the important things wetlands do to help the environment (*serve as buffer between surface runoff and rivers, thereby reduce flooding peaks; fight pollution by filtering water from rivers and streams that flow downstream; serve as a home to many species of plants and animals*)
- Name some of the wildlife that depends on wetlands. (*amphibians, such as frogs, snakes, etc.; fish, plants, birds, insects, beavers, otters, deer and bears; students may know others*)
- Describe how wild rice is harvested. (See teacher notes list)
- Why would turning cranberry bogs into wild rice beds be considered a wetlands restoration project? (*Wild rice is naturally found in wetlands; the cranberry bushes were introduced and because they are not natural to the wetland, they affect the ecosystem of the swamp.*)
- What are invasive species? (*a plant or animal species that is not naturally found in an ecosystem and tends to dominate that ecosystem until a natural predator is established.*)
- Name some of the occupations related to wetlands. (See teacher notes list)

V. Discussion Guide:

Go back to the prior knowledge discussion and ask students if any of their views were changed by watching the video. Help them begin to fully appreciate the importance of some land that doesn't look "useful" to humans, but that is essential to the health and safety of the environment and, consequently, to humans.

Review the Viewing Guide questions for understanding.

VI. Evaluation:

This curriculum lends itself to informal assessment by observing students' participation in the class discussion. Teachers might also want to collect the Viewing Guide to check for completion. A student project related to this topic also is useful to check for understanding.

Suggestions for extended learning:

Invite a wetlands scientist to speak to the class about his/her job and what particular education and potential employers are relevant to it.

Provide students with an outline drawing of the wetland ecology pyramid. Working in small groups, ask them to fill in the various levels of the pyramid. When they have finished, ask them to compare their work with a completed pyramid.

Suggested special projects:

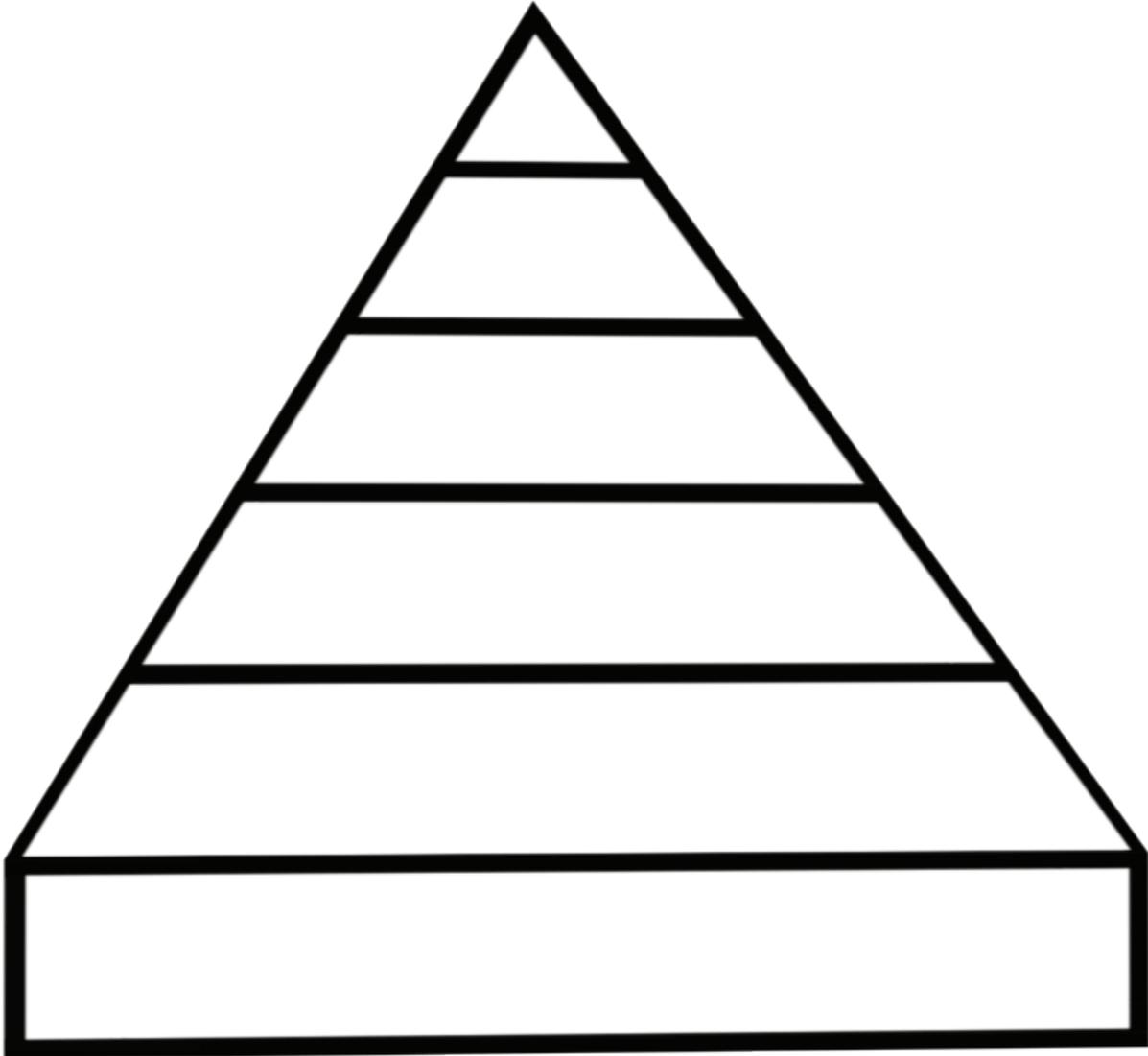
Students could research where wetlands are found in their town or neighborhood. (NOTE: In an additional video in this series, students are guided in becoming Wetland Ecologists. While special equipment is needed for this project, it could easily be used as a class project, if the teacher has access to nets, microscopes, etc.) Collect pictures of various wildlife forms found in a wetland and make a poster.

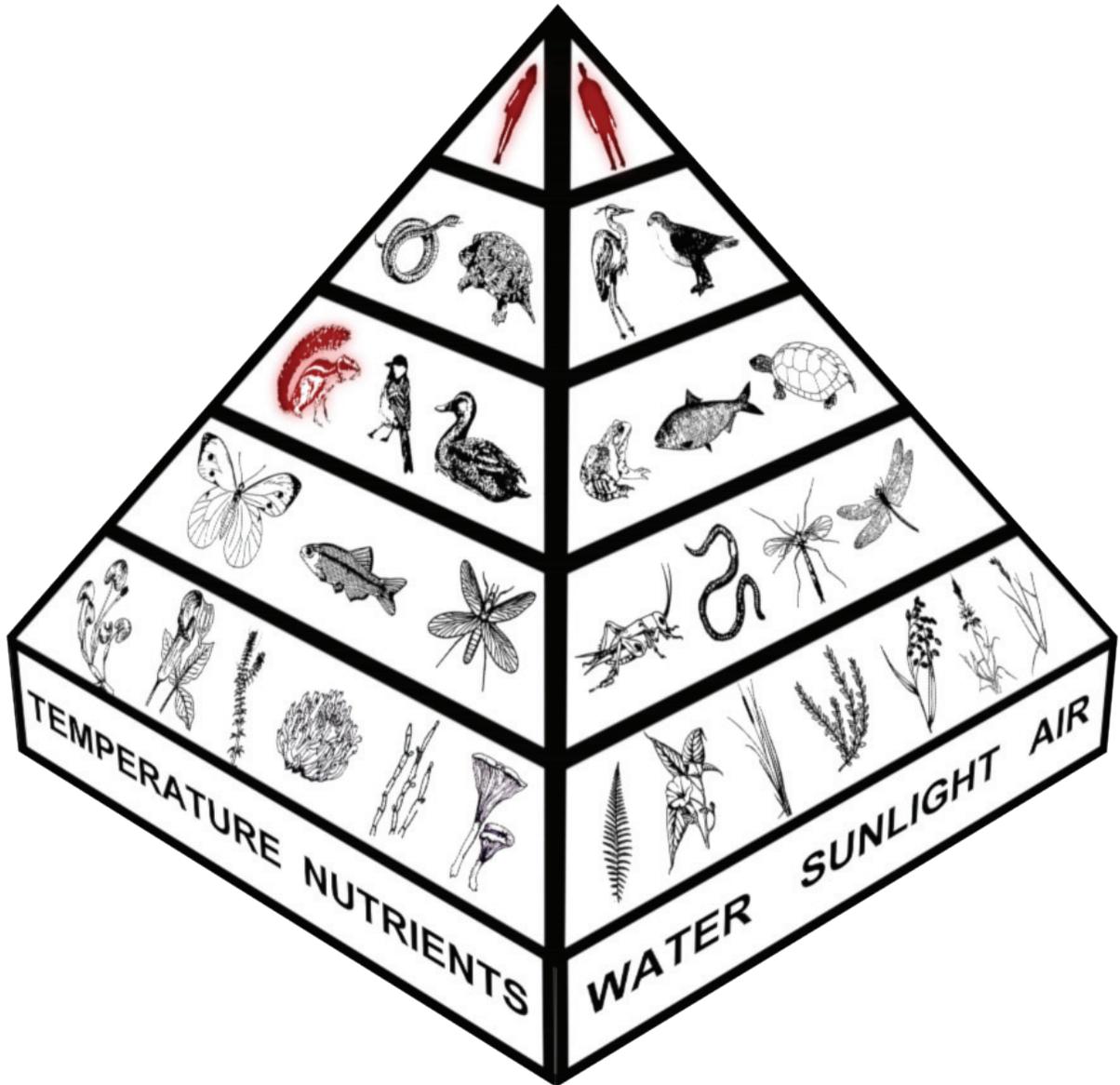
Look up a recipe for wild rice and prepare it. Share a taste with your classmates. (Wild rice is generally expensive, so students could make a quantity that provides everyone in the class with just a "taste.")

See if you can find out about any wetland restoration projects in your town or county. Volunteer to assist in it.

WETLAND ECOLOGICAL PYRAMID

In small groups, work together to fill in each level of the pyramid with words or drawings.





The following Wisconsin Student Proficiency Standards can be met teaching *Wetland Wisdom*:

A. SCIENCE:

CONNECTIONS:

How evidence explains phenomena

INQUIRY:

Understanding how questions direct research

EARTH SCIENCE:

Earth history & structure of earth

B. SOCIAL STUDIES:

GEOGRAPHY:

“Students in Wisconsin will learn about geography through the study of the relationships among people, places, and environments.”

A.8.4; A.8.6; A.8.8

ECONOMICS:

“Students in Wisconsin will learn about production, distribution, exchange, and consumption so that they can make informed economic decisions.”

D.8.5; D.8.11

Wisconsin Teacher Standards which can be met with this curriculum, including rationale:

Standard 1: Subject matter. This curriculum provides suggestions to extend information on the topic, which will enhance the teacher’s information about the subject matter.

Standard 3: Adapt instruction. The curriculum provides suggestions for learners with a variety of intelligences and levels of ability, particularly in the extended learning sections.

Standard 4: Instructional strategies. The curriculum includes the use of technology to gain information and suggestions for using research in extending learning.

Standard 5: Individual and group motivation. This curriculum involves cooperative learning, active learning, and prior knowledge.

Standard 6: Verbal and nonverbal communications. Instructional media and technology that promote active learning are key parts of this curriculum.

Standard 7: Organizes and plans systematic instruction. The curriculum is organized to support teacher knowledge, to draw on and motivate students to engage in active learning, and promotes active inquiry, collaboration, and supportive interaction in the classroom.

Standard 8: Formal and informal assessments. Suggestions for a variety of assessments, both formal and informal, are offered in the curriculum.

Standard 10: Fosters relationships. The curriculum provides information that could foster student relationships with science professionals. It also encourages students to think about the relationship between their personal environment and the needs of the general community; for example, the students might discover a wetlands restoration project that they could participate in.