

Wetland Madness

Lesson Abstract

Summary:	Through the choices posed in a game format, students are asked to consider both economic and environmental well-being in decision making processes. The activity requires students to use consequential and critical thinking skills.
Grade Level:	6-8
MO GLE:	SC4.1.D.6; 7.1.A.6; 7.1.C.6; 7.1.E.6; 8.1.C.6
Subject Areas:	Science, Social Studies
Show-Me Standards	Goals – 3.1, 3.2, 3.4, 3.6, 3.7, 4.1, 4.6 Strands – SC 3, 4, 5, 8; SS 3, 4, 5
Skills:	Application, evaluation
Duration:	1 class period (50 minutes)
Setting:	Classroom
Key Vocabulary:	Wetland management

Rationale:

- Historically, wetlands have been perceived as obstacles to progress and develop. They have been managed locally to meet needs.
- It is not always understood that an entire watershed depends on wetland functions.
- Since wetlands play such an important role, it is important for students to have an understanding of wetland management issues and be able to practice making management decisions and experience the consequences. Such experience will help them make good decisions as adult citizens.

Student relevance:

- Game playing is one way to practice problem solving.

Learning Objectives:

Upon completion, students will be able to . . .

- Make decisions and better recognize the effects of management practices with regard to wetlands.
- Describe some of the factors that often drive land use practices.

Students Need to Know:

- People must make choices every day.
- Money is often the biggest factor in decision making.
- Decisions are based upon personal values.
- Ecological concerns and economic growth are both factors in land use issues.

Teachers Need to Know:

- Best management practices as listed in Project WET Lesson, "Sum of the Parts."
- In land use issues, the health of the environment is an important aspect to consider.
- Individual monetary gain and the stability of the regional economy may override environmental considerations.
- Environmental concerns and economic growth are not mutually exclusive.

Resources:

WOW: The Wonders of Wetlands, 1995.

Available from The Water Course, 201 Culbertson Hall, Montana State University, Bozeman, MT 59717-0057, (406) 994-5392.

National Project WET: Water Education for Teachers, 1992.

Available only after attending a six-hour workshop. For more information, contact State Coordinator Joe Pitts, Department of Natural Resources, Field Service Division, P.O. Box 176, Jefferson City, MO 65102, (573) 526-6627.

Missouri Wetlands: A Vanishing Resource, *Water Resources Report No. 39*. Available from the Missouri Department of Natural Resources, Division of Geology and Land Survey, P.O. Box 250, Rolla, MO 65402, (573) 368-2125.

Also check with your local Natural Resource Conservation Service (NRCS) office or your Soil and Water Conservation District office (most are located in county seats). Telephone number for NRCS state office in Columbia is (573) 876-0900.

website for DNR publications:

<http://www.dnr.mo.gov/geology/adm/publications/pubscatalog.pdf>

Materials Needed for Lesson:

Copies of *Wetland Madness Game Board* (one per small group of students)

One set of *Decision Cards* per game board

One set of *Law Cards* per game board

One die or coin per game board

Six paper playing pieces or six different colored playing pieces per game board

Tape

Scissors

Procedure:

- Ask students to describe life decisions they have made recently. (Generate discussion on decisions and their impact.)
- Pass out game board and materials to each group.
- Each player selects a game piece and places it on the start block. The group decides who will move first; play proceeds in a clockwise direction.
- The first player rolls the die or tosses the coin and moves his/her piece the number of spaces indicated or, if using a coin, heads—one space, tails—two spaces. Players move in the direction of the arrows on the board. If a player lands on a blank space, the turn is over. If a player lands on a space marked “Roll Again,” he or she may do so and move along the board. If a player lands on “Lose a Turn,” the turn is over.
- *Decision Cards:* Players landing on the “Decision Card” space must select the top card from the shuffled deck (cards should be face down). An opponent reads the top portion of the card aloud. **Do not read aloud the Consequences.** The player has a maximum of two minutes to make a decision. When the player announces a decision, the person holding the card reads the Consequences for that decision, which tells how many spaces the player has earned or lost for the decision. The player will follow the instructions on the card and return the card to the bottom of the pile. The player’s turn continues until he or she lands on a blank space or “Lose a Turn” space.
(Note to Teachers: In this game, students are rewarded for making decisions that protect wetlands. Emphasize the importance of wetlands for stream quality, flood control, and fish and wildlife habitat. Economic issues and ramifications should also be discussed. Encourage students to look at all angles and suggest alternative choices is possible.)
- *Law Cards:* Players landing on the “Law Card” space select the top card from the shuffled deck (cards should be face down). The person landing on the space reads the card aloud to the group and must comply with the directions on the card.
- The first player to reach the “Winner” space by an “exact” roll or flip is the winner. Players not getting an exact roll or flip lose their turn to the next player.

Evaluation Strategies:

- Students demonstrate their understanding of management practices that help protect wetlands by choosing consequences that allow them to move ahead on the game board.
- Students identify considerations that are important when making a decision.
- Students identify good management practices in newspaper and magazine articles about wetlands.

Extension Activities:

- Invite members of the community—a landowner, farmer, a planning and zoning commissioner, highway department employee, or others to discuss how they deal with wetland management issues and the laws that apply. Have students prepare questions for the visitors.
- Have students formulate a hypothesis of impacts of a strip mall development on a wetland and the immediate vicinity of the construction. Students will set up a research experiment to evaluate the impact to the ecological communities in the wetlands from excessive runoff from the impermeable surfaces and siltation from construction and provide a conclusion based on current published research. Here is a good starting point:
<http://www.epa.gov/owow/wetlands/facts/fact25.html>

Suggested Scoring Guide:

Wetland Madness

Teacher Name: _____

Student Name: _____

CATEGORY	4	3	2	1
Contributions	Routinely provides useful ideas when participating in the group and in classroom discussion. A definite leader who contributes a lot of effort.	Usually provides useful ideas when participating in the group and in classroom discussion. A strong group member who tries hard!	Sometimes provides useful ideas when participating in the group and in classroom discussion. A satisfactory group member who does what is required.	Rarely provides useful ideas when participating in the group and in classroom discussion. May refuse to participate.
Problem-solving	Actively looks for and suggests solutions to problems.	Refines solutions suggested by others.	Does not suggest or refine solutions, but is willing to try out solutions suggested by others.	Does not try to solve problems or help others solve problems. Lets others do the work.
Focus on the task	Consistently stays focused on the task and what needs to be done. Very self-directed.	Focuses on the task and what needs to be done most of the time. Other group members can count on this person.	Focuses on the task and what needs to be done some of the time. Other group members must sometimes nag, prod, and remind to keep this person on-task.	Rarely focuses on the task and what needs to be done. Lets others do the work.
Monitors Group Effectiveness	Routinely monitors the effectiveness of the group, and makes suggestions to make it more effective.	Routinely monitors the effectiveness of the group and works to make the group more effective.	Occasionally monitors the effectiveness of the group and works to make the group more effective.	Rarely monitors the effectiveness of the group and does not work to make it more effective.
Working with Others	Almost always listens to, shares with, and supports the efforts of others. Tries to keep people working well together.	Usually listens to, shares with, and supports the efforts of others. Does not cause "waves" in the group.	Often listens to, shares with, and supports the efforts of others, but sometimes is not a good team member.	Rarely listens to, shares with, and supports the efforts of others. Often is not a good team player.
Attitude	Never is publicly critical of the project or the work of others. Always has a positive attitude about the task(s).	Rarely is publicly critical of the project or the work of others. Often has a positive attitude about the task(s).	Occasionally is publicly critical of the project or the work of other members of the group. Usually has a positive attitude about the task(s).	Often is publicly critical of the project or the work of other members of the group. Often has a negative attitude about the task(s).

Rubric Made Using: **RubiStar** (<http://rubistar.4teachers.org>)

Decision Cards

Decisions Decisions!

You are a farmer. You own 100 acres near the water, which you plant in corn. Times are tough and you and your spouse are expecting a child. In the past, you have always left a strip of land along the waterway unplowed. The natural growth of wetland plants helps keep the water clean and provides habitat for many animals. But if you planted corn there instead, you'd have about 15 extra acres of crops. Will you (A) plow it this year or (B) not plow it?

Consequences:

- (A) Move back 1 space.
- (B) Move ahead 4 spaces. That's a tough decision!

Decisions Decisions!

Today is Saturday, and you have tickets to a very cool outdoor concert that you've been looking forward to for months. The tickets cost you a month's allowance but are worth it. Your little brother just came in and told you about the wetland clean-up day near his school. They plan to pick up trash and plant new plants all around the area. He is very excited and wants you to come and help since they need lots of people to get the work finished. If you go, you'll miss the concert. Where will you go? (A) Little brother, (B) Concert.

Consequences:

- (A) What a sacrifice! Move ahead 3 spaces.
- (B) Stay where you are.

Decisions Decisions!

You are very wealthy landowner who is about to build a housing development that will make you even richer! The land contains some wetlands which would be destroyed by the project. You can (A) cancel the project, or (B) go to great expense to build new wetland nearby to replace the one that will be destroyed. Which do you choose?

Consequences:

- (A) Move ahead 3 spaces. (B) Move ahead 1 space. The plan to replace the wetland is a decent choice, but the costs (money and habitat) may outweigh the benefits. Natural wetland may be healthier.

Decisions Decisions!

You work for the state's highway department. A new road being built will destroy six acres of wetland. To get the permit to build the road, the department had to promise to replace the wetlands. You are in charge of hiring a company to do the work, and you must choose between two companies. The expensive one *guarantees* that the new wetlands will survive; the cheaper one doesn't, but thinks their wetland will be good. Will you (A) save state money and take a chance on the wetlands' survival, or (B) spend more and get the guarantee?

Consequences:

- (A) Move back 4 spaces.
- (B) Move ahead 3 spaces.

Decision Cards (continued)

Decisions Decisions!

You've designed your dream house, and you're very proud of it. The plans show a beautiful front that faces a quiet street and a garage in the back with a long driveway around to it. There are wetlands in your backyard that will have to be filled in for the driveway and garage. Will you (A) build the house as planned, or (B) put the garage and a shorter driveway in front of the house, which will be cheaper, but will wreck your design and obstruct the view of the front of your house?

Consequences:

- (A) Move back 2 spaces.
- (B) Move ahead 2 spaces.

Decisions Decisions!

You have inherited \$50,000! Now you can buy land and build your dream house. You narrow your choices to two properties. One (A) lies right along the shore of a beautiful bay; the other (B) is nestled in a quiet upland forest. Both properties cost the same. Which will you choose?

Consequences:

- (A) Building that close to the water will surely harm or destroy wetlands! Move back 3 spaces.
- (B) If you cut only enough trees to make room for the house, you will harm less natural habitat than you would in (A). Move ahead 3 spaces.

Decisions Decisions!

You live in a bustling city that is near a large river. It is Election Day for a new state governor. Candidate "A" promises increased economic growth and more jobs. He supports the construction of a huge new shopping mall near the river. Candidate "B" process to increase economic growth by promoting travel and recreation. He also wants to build a mall in an abandoned building site near a major highway. Will you vote for (A) or (B)?

Consequences:

- (A) Building close to the water will surely harm or destroy wetlands. The city and state do not seem bad in need of growth and can make money in other ways. Move back 3 spaces.
- (B) It makes sense to build in an area that is already developed, keeping wetlands intact so they can add to the economy in other ways. Move ahead 3 spaces.

Decisions Decisions!

You are a kind-hearted person who donates \$200 each year to a charity or good cause. You have been asked to give money to either (A) a conservation organization that helps protect wetlands worldwide, or (B) a local Boy Scout troop. If you choose "B", you can ask the Scouts to use the money to clean up and restore a small wetland in your community. Which will you choose?

Consequences:

- Both* choices have their merits. Move ahead 1 space.

Decision Cards (continued)

Decisions Decisions!

You are a farmer who is getting older and thinking about retiring. Your land was once a wetland (a shallow area that stayed very wet throughout the spring). If you stop plowing the land, it will turn into a wetland again. You need to sell your land to earn retirement money. You are offered money from (A) someone who will develop the land for housing or business and offers you twice as much money, plus (B) a conservation organization that will keep the land as wetland preserve, providing you with a tax break. Which will you choose?

Consequences:

- (A) Move back 2 spaces.
- (B) Move ahead 3 spaces.

Decisions Decisions!

You are a town zoning officer, you decide the number and type of places that can be built in your area. One of the only few wetlands in the town is due for rezoning. The townspeople are encouraging you to vote in one of two ways on the zoning: (A) allow housing for the poor to be built there (this housing is badly needed); (B) zone the area for preservation. Which will you choose?

Consequences:

- (A) The housing is needed, but it can be built in another location. The wetland is needed for good water quality. Move back 2 spaces.
- (B) With so few wetlands in town, too many benefits would be lost by destroying the site in question. Move ahead 2 spaces.

Law Cards

<p>Building a boat ramp on the Missouri River.</p> <p>Violation of Section 10, The Rivers and Harbor Act; Clean Water Act, Section 404.</p> <p>LOSE ONE TURN.</p>	<p>Draining wetlands on land that is enrolled in a federal farm land program.</p> <p>Violation of Food Securities Act.</p> <p>LOSE ONE TURN.</p>
<p>Discharging heated water from a power plant into tidally-influenced channels that flow through a wetland.</p> <p>Violation of the Clean Water Act, Section 401, and Coastal Planning & Zoning Act.</p> <p>LOSE ONE TURN.</p>	<p>Building a private dam on a stream that supports a population of Niangua Darter.</p> <p>Violation of Clean Water Act, Section 401 and Section 404.</p> <p>LOSE ONE TURN.</p>
<p>Using federal funds to build a fishing pier next to a least tern and piping plover nesting site.</p> <p>Violation of Rivers and Harbors Act; Endangered Species Act.</p> <p>LOSE ONE TURN.</p>	<p>Building a golf course in a wetland adjacent to a bald eagle nest tree.</p> <p>Violation of Clean Water Act, Section 401.</p> <p>LOSE ONE TURN.</p>
<p>Planting a grain crop.</p> <p>No violation.</p> <p>MOVE ONE SPACE.</p>	<p>Grazing cattle in a wetland.</p> <p>No violation.</p> <p>MOVE ONE SPACE.</p>
<p>Mowing cattail vegetation in wetlands.</p> <p>No violation.</p> <p>MOVE ONE SPACE.</p>	<p>Creating a wetland in an upland area.</p> <p>No violation.</p> <p>MOVE ONE SPACE.</p>
<p>Putting a wetland in a wetland bank system.</p> <p>KEEP AND USE TO PREVENT LOSS OF ONE TURN.</p>	