



Hydropoly: A Decision-Making Game

Activity: Students play a board game to hone their decision-making skills. Through the various choices posed in the game, they are asked to consider both economic and environmental well being in making decisions.

Grade Level: 4-8

Subjects: Science, social studies

Setting: Classroom and/or outside

Duration: 1 hours

Key terms: Land Use, Wetland

OBJECTIVES

After participating in this activity, students will be able to:

- Discuss land-use practices that affect Great Lakes wetlands
- Make decisions and recognize personal priorities with regard to wetlands
- Describe some of the economic factors that often drive land use

SUMMARY

Every day we make choices. We decide simple things like what to wear, what to eat, or how much time to allow for homework. Some decisions, however, require us to think critically and consider the potential consequences of our actions. Through the various land-use choices posed in the game Hydropoly, students must consider both the economic and environmental consequences of their decisions. This type of decision-making helps prepare young people for situations they'll encounter throughout their lives.

BACKGROUND

Coastal and inland communities in the Great Lakes region face difficult land use decisions every day. Land use refers to how land within a community is used—whether for houses, businesses, agriculture or natural areas. Local leaders must decide where to build houses and what type of industry to support. Communities must also consider another important factor—the health of the environment. A healthy environment that allows for natural areas, open green space,

and clean water attracts residents and enhances quality of life.

Protecting wetlands is another way to enhance our natural environment. Wetlands provide important ecological benefits—such as water filtration, habitat and flood control—that need to be considered in land use decisions. Yet wetland benefits are frequently overlooked. Financial gain and economic concerns often override environmental issues. Despite this historic trend, some communities are recognizing that a healthy environment is closely tied to a healthy economy. We could call this principle “economics”—the healthy marriage of ecological protection and economic growth.



ADAPTED FROM FISHERIES LEARNING ON THE WEB
[HTTP://WWW.MISEAGRANT.UMICH.EDU/FLOW](http://www.miseagrant.umich.edu/flow)
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In essence, all land use decisions have short- and long-term consequences that affect the environment. It's important to weigh the pros and cons of every decision and make the best choices possible.

MATERIALS & PREPARATION

- Hydropoly game boards (one for each small group of students)
- One set of Decision Cards per game board
- One die (not pair) per game board
- Tape
- Scissors
- Six different-colored playing pieces per game board (construction paper squares or pieces from another game)

Advance Preparation

1. Read the game instructions.
2. Copy Decisions Cards (2-3 sets). Cut apart individual cards.
3. Design a game board for use in your classroom. The game board should have the following types of labeled space: Start, Roll Again, Lose a turn, Decision Card, many blank spaces, The Winner.

PROCEDURE

- 1) Ask students to describe decisions that they have made recently. What do they like and dislike about making decisions? What helps them make a wise choice? Have them list important considerations. Have any of them made a wrong decision recently (or ever)? How can wrong decisions be a good experience? (We can learn from our mistakes.)
- 2) Divide the class into small groups. Hydropoly may be played by 2-6 players, or 2-6 teams of players. Discuss "eco-nomics" before beginning to play.

Review the Rules

- 1) Each player (or team) selects a game piece and places it on the space marked "Start." Each player rolls the die. The player who rolls the highest number goes first. Play proceeds in a clockwise direction.

- 2) The first player rolls the die and moves his or her playing piece the number of spaces indicated on the die. Move in the direction indicated by the arrows on the board. When a player lands on a blank space, his or her turn is over, and play advances to the next player. When a player lands on a space marked "Roll Again," s/he may do so and move along the board as before. If a player lands on "Lose A Turn," the turn is over, and s/he must skip the next turn.
- 3) Decision Cards: when a player lands on a "Decision Card" space, s/he must randomly select one of the cards (cards should be face-down). An opponent reads the top portion of the card aloud. (Do not read the "Consequences" out loud.) The player has a maximum of two minutes to make a decision. If playing in teams, team members may discuss the decision quietly. When a player announces his or her decision, the person holding the card reads the "Consequences," which tell how many spaces the player has earned or lost for the decision. The player must follow the instructions given on the card and return the card to the pile. The player's turn continues until landing on a blank space or "Lose A Turn." Play then moves to the next player or team.
- 4) Players may only reach "The Winner" space by an exact roll of the die. (If a player is 4 spaces away, for example, and rolls a 5, s/he may not move and must forfeit the turn. If a player rolls a 3, s/he moves 3 spaces but must then roll a 1 to win.)

Note: The consequences specified on each Decision Card reward learners for choosing certain actions in relation to their environments. If you wish other values to be considered, have the class or team of students determine a new set of consequences and substitute them on the "Decision Cards" before the game begins.

- When students understand the rules, play the game! You may choose to have learners play "blind" first, and then discuss "eco-nomics" after the game. Play several games.

- After the games have ended, discuss the results—who won, and why the winner reached the end more quickly than others. What did the players think about while making decisions? Students can revise or confirm the considerations they made in the opening discussion.

Discuss the results

Discuss why it is important to consider wetlands, coastal resources, and other environmental matters in scenarios like those presented in the game. Have students research community actions regarding aquatic resource management. Do they think wise decisions were made?

ADAPTATIONS

Have students write a series of Decision Cards that apply to the management of a wetland or other aquatic resources (such as lakes, rivers and coastlines) in their community. Include current political debates if possible.

SOURCE

Adapted from Fisheries Learning on the Web, <http://www.miseagrant.umich.edu/flow>, an activity originally from WOW! The Wonders of Wetlands, for the Great Lakes Education Program, Michigan Sea Grant.

GLOSSARY

Land Use: Refers to how land within a community is utilized. Some examples of land uses include urban, suburban, commercial (business/shopping districts), agricultural (farming), or natural areas.

Wetland: An area, such as a bog, swamp, or marsh that has seasonally wet soils and a distinct plant community. Wetlands provide valuable nursery areas and habitat for many plants and animals.

ASSESSMENT/EVALUATION

An assessment chart is included in the following pages to allow teachers to create their own assessment.

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Assessment

This assessment chart was designed for teachers to create their own assessment. The recommended points show the relative difficulty of student performance. In creating assessments, the total point value will depend on the number and type of performances selected.

Learning Objective	Student Performance	Recommended # Points
Discuss land-use practices that affect Great Lakes Wetlands	List: Various land-uses which occur at or near wetlands that reduce their health or existence	1 each
	List: Various land-uses which occur at a distance to the wetlands that reduce their health or existence	1 each
	Explain: How each of the above directly or indirectly affects wetlands.	2 each
Make decisions and recognize personal priorities with regard to wetlands	Argue or defend: A personal position given a controversy over a wetland (can use news articles or create a story)	5-10 (depending on essay requirements and length, as well as grade level)
Describe some of the economic factors that often drive land use	List: Some ways that natural areas are altered by humans	1 each
	Explain: Each of the above in terms of the reasons people give for doing so	2 each

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Standards and Benchmarks

For PDF summaries of the Elementary and Middle school standards listed here, see:

Elementary: www.miseagrant.umich.edu/flow/pdf/FLOW_Elementary_Standards.pdf

Middle: www.miseagrant.umich.edu/flow/pdf/FLOW_Middle_Standards.pdf

State of Michigan

Science	
Elementary	Middle
I.1.1 II.1.4 III.5.3 III.5.5 V.1.1	II.1.1 II.1.3 II.1.4 III.5.6 V.1.5

Social Studies	
Elementary	Middle
I.4.1 II.2.2 II.4.5 VI.1.1 VI.1.3 VI.2.1	II.2.3 II.2.4 II.2.5 II.5.3 VI.1.2 VII.1.1

National

NSES	
Elementary	Middle
C1-1 C3-2 C3-4 E1-2 F3-3 F4-1 F4-2 F4-3	C4-4 E1-5 F2-1 F3-2 F4-4
NAAEE	
Elementary	Middle
2.2-C 2.3-A 2.3-D 2.3-E 2.4-A 2.4-C 2.4-E 3-B 3.2-D 4-D	2.2-C 2.3-A 2.3-C 2.3-D 2.4-A 2.4-C 2.4-E 3-B 3-C 3.2-A 4-D

AAAS	
Elementary	Middle
5D-1 5D-4 11C-2	4B-8 4C-7 5D-1 11A-2
NCSS	
Elementary	Middle
II.f III.h III.i III.k V.g VI.c VII.j VIII.d IX.d IX.e X.j	II.f III.g III.h III.i III.k V.g VI.a VI.c VII.f VII.j VIII.b VIII.e IX.d X.c

Notes:

NSES = National Science Education Standards

AAAS = American Association for the Advancement of Science (Benchmarks)

NAAEE = North American Association of Environmental Education (Guidelines for Excellence)

NCSS = National Council for the Social Studies (Standards)

HYDROPOLY DECISION CARDS

Note to Educators:
*The consequences specified
for each decision
reflect a certain set of values.
Alternative consequences
more specific to your community
may be substituted by you
or a team of class members.*

HYDROPOLY DECISION CARD

DECISIONS! DECISIONS!

You have inherited \$500,000! Now you can buy land and build your dream home. You narrow your choices down to two properties. One (A) lies right along the shores of beautiful Crystal Lake; 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 three 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 three spaces.

HYDROPOLY DECISION CARD

DECISIONS! DECISIONS!

You live in a bustling city that lies near the Clinton 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 proposes 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 Clinton River will surely harm or destroy wetlands. The city and state do not seem to be badly in need of growth and can make money in other ways. Move back three 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 three spaces.

HYDROPOLY DECISION CARD

DECISIONS! DECISIONS!

You are a kindhearted 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 A, you will be helping to preserve wetlands and protect wildlife all over the world. 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 and positive results. Move ahead one space.

HYDROPOLY DECISION CARD

DECISIONS! DECISIONS!

You are a farmer who is getting older and thinking about retiring. Your land was once a Great Lakes 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 (B) a conservation organization that will keep the land as a wetland preserve, providing you with a tax break. The developer offers you twice as much money. Which will you choose?

Consequences

(A) Move back two spaces. (B) Move ahead three spaces.

HYDROPOLY DECISION CARD

DECISIONS! DECISIONS!

You are a town zoning officer. You decide the number and type of places that can be built in your Great Lakes area. One of only a 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 two spaces. (B) With so few wetlands in town, too many benefits would be lost by destroying the site in question. Move ahead two spaces.

HYDROPOLY DECISION CARD

DECISIONS! DECISIONS!

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

Consequences

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

HYDROPOLY DECISION CARD

DECISIONS! DECISIONS!

You are a farmer. You own 100 acres near the Kalamazoo River, 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 the aquatic plants helps keep the water clean and provides habitat for many animals. But if you planted corn there instead, you would have about 15 extra acres of crops. Will you plow it this year (A) or not (B)?

Consequences

(A) Move back three spaces. (B) Move ahead 4 spaces. That is a tough decision!

HYDROPOLY DECISION CARD

DECISIONS! DECISIONS!

Today is Saturday, and you have tickets to a very cool outdoor concert that you have been looking forward to for months. The tickets cost you a month's allowance, but it is worth it. Your little brother just came in and told you about the Lake Gogebic 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 done. If you go, you will miss the concert. Where will you go? (A) With your little brother; (B) to the concert.

Consequences

(A) What a sacrifice! Move ahead three spaces. (B) Move back one space.

HYDROPOLY DECISION CARD

DECISIONS! DECISIONS!

You work for the state's highway department. A new road being built will destroy six acres of Great Lakes coasts and wetlands. 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 does not, 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 three spaces.

HYDROPOLY DECISION CARD

DECISIONS! DECISIONS!

You have designed your dream house, and you are 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 Au Sable River 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? (This will be cheaper, but will wreck your design and obstruct the view of the front of your house.)

Consequences

(A) Move back two spaces. (B) Move ahead two spaces.