

Wetland Neighbors

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Students will participate in a role-playing activity in order to better understand how wetlands impact and are impacted by the non-wetland habitats which they border.

The borders of wetlands naturally transition into other habitats, such as forests, meadows, or other types of wetland habitats. Increasingly, wetlands are also found to bordering altered areas in community developments, such as residential neighborhoods, commercial and industrial development, and groomed green spaces.

A transfer of natural resources occurs between wetlands and other areas, and often in both directions. Nutrients, water, oxygen, and energy are all natural resources that are used and transferred between habitats. Human activity may also change the rate at which natural events occur. For instance, erosion may occur more quickly with development, introduction of invasive species may over run the native species that maintain a wetland's health, and runoff from fertilizer use on lawns may unnaturally increase the rate of growth in wetlands.

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GRADE LEVEL: upper elementary, middle school

DURATION: one 30-40 minute class period

OBJECTIVES

After this activity, students will be able to:

- List the different habitat types found within their local area
- List types of resources that transfer between habitats and ecosystems
- Conclude which human activities may be threats to wetlands

MATERIALS

- One 'habitat' card per student
- Event cards, or a printed list of events
- Tokens (five 'resource' tokens and two 'pollution' tokens per student, plus a few extras for the instructor to hold)

PROCEDURE

1. Begin with a short discussion focused on how both neighboring habitats and development can impact the health of a wetland. Explain that nutrients, water, energy, and pollution are among some of the things that can be transferred between habitats.
2. Explain to the students that they will be representing one of the habitats that may be found in their local area. Each student will represent a type of wetland, other natural habitat, or community development. Hand out a 'habitat' card to each student and ask them to familiarize themselves with the types of habitat that they will represent. Select enough cards from the following to allow one card per student. Duplicate cards may be used if needed, but use a balanced ratio of cards between the 'wetland', 'other habitat', and 'development' categories.
3. Hand out a set of tokens to each student as well. Tokens can either be objects of two different colors, or can be cards with the word printed on a unique color of paper.

- Give each student five 'resource' tokens and two 'pollution' tokens at the beginning of the role play. The instructor should hold the remaining tokens.
4. Ask the students to sit in groups with the other members of their habitat and display a sign that identifies their habitat type.
 5. The instructor will read an 'event card' from the list that follows, and will ask the students to follow the instructions on the card. The cards can either be printed or simply read randomly from the list. Continue play for approximately ten minutes or until an obvious pattern develops.
 6. Bring the students together again and discuss the following questions as a large group:
 - Did you notice patterns about the way the 'resource' or 'pollution' tokens moved between habitats? Which category has the most/least of a token?
 - What are some of the benefits of habitats that border one another? What are some of the consequences?
 - How do the activities of people affect wetland habitats?

EXTENSION

1. Ask students to identify habitats in their community that border wetlands and discuss how they might impact the wetland habitats.
2. Other threats exist for wetlands, beyond those listed in this lesson. Ask students to research and make a list of threats to wetlands.
3. Have students document observations from this lesson and share with another classroom via social media.

HABITAT CARDS		
<p>WETLAND HABITAT: MARSH</p> <p>Marshes are shallow and have emergent plants – or plants that rise above the water – like cattails and rushes. Water flows through the marsh, unlike some other types of wetlands.</p>	<p>OTHER HABITAT: CONIFEROUS FOREST</p> <p>Most of the trees in the forest are those that have needles instead of leaves. The needles stay on year-round.</p>	<p>DEVELOPMENT: RESIDENTIAL</p> <p>You represent a neighborhood where there are many homes and streets, but not many businesses or parks.</p>
<p>WETLAND HABITAT: SWAMP</p> <p>A swamp is a wetland found within a forest. Trees grow in the nutrient-rich soils and it may have standing water for part of the year.</p>	<p>OTHER HABITAT: BROAD-LEAF FOREST</p> <p>Most of the trees in the forest are those that have leaves that drop every year.</p>	<p>DEVELOPMENT: BUSINESS</p> <p>Shops and offices are found throughout our communities. Many use electricity, produce waste, and may have paved parking areas.</p>

HABITAT CARDS		
<p>WETLAND HABITAT: TIDAL MARSH</p> <p>A tidal marsh is a shallow area found at the place where an ocean meets land. Salt water floods the marsh when the tide comes in and drains when the tide goes out.</p>	<p>OTHER HABITAT: COMMUNITY PARK</p> <p>Parks may have many of the plants and animals that are found in other habitats. Parks also may have places for people to gather – such as recreation areas, buildings, parking areas, and lawns.</p>	<p>DEVELOPMENT: FACTORY</p> <p>Factories are large facilities that produce many of the goods that people buy and use. Factories use electricity, produce waste, and some can create pollution that is released into the air or water.</p>
<p>WETLAND HABITAT: BOG</p> <p>Not much water flows in or out of a bog, and this makes the bog acidic and low in nutrients. The plants and animals found in bogs are specialized to live in these conditions.</p>	<p>OTHER HABITAT: DESERT</p> <p>Deserts have very few clouds, are very dry, and get little rain throughout the year. Even so, deserts have plants and animals that are specialized to live in these conditions.</p>	<p>DEVELOPMENT: MAJOR ROAD</p> <p>Most major roads are paved with a hard surface. Vehicles driving over them can leave chemicals on the road. When it rains, the chemicals can combine with the water and run off.</p>
<p>WETLAND HABITAT: VERNAL POOLS</p> <p>This is a shallow wetland that usually fills with water during the spring and dries up later in the year. Plants and animals that live here are adapted to this.</p>	<p>OTHER HABITAT: GRASSLANDS</p> <p>This habitat is made of mostly grasses, growing in a dry but rich soil. Grasslands can have occasional fires and strong winds.</p>	<p>DEVELOPMENT: FARM & RANCH</p> <p>The food that we eat is produced here – grains, fruits, vegetables, dairy, and meat. Fertilizers, antibiotics, or other chemicals may be used to help things grow. They can also use electricity and produce waste.</p>
<p>WETLAND HABITAT: MANGROVE SWAMP</p> <p>This is a wetland found along the coast of tropical and subtropical regions (like the Gulf of Mexico). Trees that grow in mangroves can live in salt water and help stop erosion.</p>	<p>WETLAND HABITAT: RIVER</p> <p>A river is made of freshwater and carries water downstream to other bodies of water. A river’s shoreline winds through many habitats as it moves downstream.</p>	<p>WETLAND HABITAT: OCEAN</p> <p>An ocean is the largest body of water and is also filled with salt water. Most of the water on earth can be found in oceans.</p>

EVENT CARDS		
<p>FLOOD</p> <p>A flood occurs and the soil from the shorelines of wetlands are eroded. The wetlands gain nutrients from the soil. All habitats give 1 'resource' token to a wetland.</p>	<p>POLLUTION RUNOFF</p> <p>There has been a heavy rain. Oil and other chemicals on the roadways and parking lots have been washed off with the rainwater into the wetlands. The 'major road', 'school', 'residential' groups should give 1 'pollution' token to a</p>	<p>POLLUTION FILTERING</p> <p>The plants in the wetlands have neutralized some of the pollution that has collected in the water. Wetlands can give 1 'pollution' token to the instructor, if they have one.</p>
<p>MIGRATION</p> <p>Shorebirds have stopped by the wetlands to rest and eat on their migration. Each wetland should give 1 'resource' token to the instructor.</p>	<p>FISHING</p> <p>People harvest fish from the oceans, lakes, and rivers. Fish provide nutrients when eaten. The 'ocean' and 'river' category should give 1 'resource' token to the 'residential' category.</p>	<p>FERTILIZING</p> <p>Fertilizer may be used on some lawns and farms. Rain can wash these fertilizers into the wetlands. The 'residential' and 'farm', and 'community park' categories should give 1 'pollution' token to a wetland.</p>
<p>PEAT</p> <p>Bogs form peat as plants slowly grow and decay in this type of wetlands. Historically, people used to harvest peat to heat their homes. Bogs should give 1 'resource' token to the 'residential' category.</p>	<p>CONSTRUCTION</p> <p>A new store is being built in an area where a wetland used to be. The 'business' category should take 1 'resource' token from a wetland and if they have 1 'pollution' token, they should give it to a wetland.</p>	<p>SCAT</p> <p>Migrating birds have left the wetlands after refueling. As they fly, they will be leaving scat along their path. Wetlands should give 1 'resource' token to another habitat or development.</p>
<p>WATER</p> <p>Very little rain means plants aren't growing well. The 'farm', 'residential', and 'community park' categories should take 1 'resource' token from a wetland, since they use water to grow lawns and crops.</p>	<p>CHANGING HABITAT</p> <p>Decaying wetland plants are filling in a wetland with new soil. Forests on the edge of a wetland begin to use the new soil. The 'forest' categories may take 1 'resource' token from a wetland.</p>	<p>DAM</p> <p>The community needs a power plant and is building a dam upstream from a wetland. All 'wetland' categories should give 1 'resource' token to anyone in the 'development' category.</p>