

Teacher's Guide

Wetlands: Webbed Feet Not Required



Ducks Unlimited Canada
Conserving Canada's Wetlands

2009

Government
of Alberta ■



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This icon refers to online supplementary resources.

Wetlands: Webbed Feet Not Required is a resource guide that combines a variety of hands-on, interactive activities with inquiry-based learning. *Wetlands: Webbed Feet Not Required* aligns with curriculum expectations for Grade Five Science Topic E: Wetland Ecosystems. The activities in this guide also make connections to other subjects such as Language Arts, Physical Education, Geography and Social Studies. Supplementary resources related to the activities can be found on Alberta Environment's website.

Additional resources that support *Wetlands: Webbed Feet Not Required* include a poster and a Wetlands Wonderlands DVD. These can be ordered from Alberta Environment.

Wetlands: Webbed Feet Not Required Poster

The poster depicts two wetland types:

1. a black spruce / sphagnum moss bog on the left
2. an open water marsh on the right

The poster front illustrates the ecology of wetlands, functions, values and issues. The poster front shows five general functions of wetlands:

1. **Life Support** – wetlands provide habitat for many species of plants, animals, insects and birds including sedges, cattails, bulrushes, garter snakes, muskrats, moose, dragonflies, water striders and black spruce.
2. **Hydrology** – wetlands store water and replenish water sources such as ground water, and raise the level of the water table.
3. **Water Quality** – wetlands act as water filters. Plants growing along the edges help filter the water of the marsh and trap sediment.
4. **Economics** – agriculture, peat extraction and trapping are all examples of economic activities that are derived from, and have an impact on, wetlands.
5. **Heritage / Social** – wetlands are a source of recreation and education as shown by the hikers near the edge of the marsh, and the photographer in the forested bog. Hunters are also attracted to wetlands because of the diversity of wildlife.

The poster back includes information for students to use, so they may complete activities related to the poster front. Electronic versions of the poster back activities are online.

Puzzle Pieces

A black and white version of the poster front is available online. The poster front is divided into 28 - 8.5" x 11" panels which can be photocopied and pieced together to form a wall sized poster (7 panels in length by 4 panels in width). Some activities in the guide provide ideas on how to use these puzzle pieces.

Through the use of this resource, students will:

- Develop an understanding of wetland types in Alberta, and the factors and conditions determining different types of wetlands
- Examine watersheds and how wetlands play a role in the health of watersheds
- Discover the diversity of life in wetland ecosystems
- Explore and examine the functions and values associated with wetlands in Alberta
- Identify wetland threats and gain an understanding of wetlands conservation through action projects

General Learner Expectations:

5-1 Design and carry out an investigation, using procedures that provide a fair test of the question being investigated	Activity 6, 9
5-2 Recognize the importance of accuracy in observations and measurement; and with guidance, apply suitable methods to record, compile, interpret and evaluate observations and measurements	Activity 6, 9

Specific Learner Expectations:

5-10 Describe the living and nonliving components of a wetland ecosystem and the interactions within and among them

5-10-1 Recognize and describe one or more examples of wetland ecosystems found in the local area: e.g. pond, slough, marsh, fen, bog	Activity 2, 3, 5, 9
5-10-2 Understand that a wetland ecosystem involves interactions between living and nonliving things, both in and around the water	Activity 1, 2, 3, 4, 6, 7, 9, 10, 16, 17
5-10-3 Identify some plants and animals found at a wetland site, both in and around the water; and describe the life cycles of these plants and animals	Activity 1, 2, 3, 9, 11, 12, 18



5-10-4 Identify and describe adaptations that make certain plants and animals suited for life in a wetland	Activity 7, 11, 12
5-10-5 Understand and appreciate that all animals and plants, not just the large ones, have an important role in a wetland community	Activity 2, 5, 9, 18
5-10-6 Identify the roles of different organisms in the food web of a pond: <ul style="list-style-type: none"> • Producers – green plants that make their own food, using sunlight • Consumers – animals that eat living plants and/or animals • Decomposers – organisms, such as moulds, fungi, insects and worms, that reuse and recycle materials that were formerly living 	Activity 6, 8, 10
5-10-7 Draw diagrams of food chains and food webs, interpret such diagrams	Activity 7, 8, 9
5-10-9 Identify human actions that can threaten the abundance or survival of living things in wetland ecosystems: e.g. adding pollutants, changing the flow of water, trapping or hunting pond wildlife	Activity 4, 6, 9, 10, 12, 13, 15, 16, 17
5-10-10 Identify individual and group actions that can be taken to preserve and enhance wetland habitats	Activity 4, 13, 15, 19, 17, 19
5-10-11 Recognize that changes in part of an environment have effects on the whole environment	Activity 6, 9, 13, 15, 16, 18, 19



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Part I: Wetlands Welcome



Introduction to Wetlands



In Part I students will:

- Learn what a wetland is
- Learn the plants and animals that live in wetlands
- Identify the different types of wetlands
- Understand the concept of interactions between living and nonliving components
- Understand the concept of a watershed and how it is related to wetlands
- Identify human actions that can threaten wetlands
- Learn about wetlands around the world





Objective

Students will recognize and describe the various plants and animals that might live in a wetland, as well as the interactions among living and nonliving things.



Curriculum Connections

5-10-2, 5-10-3



Time

25 minutes



Materials

- Wetlands posters



CD

Refer to the folder “What is a Wetland” for information on wetlands.



Procedure

1. Divide the class into groups and hand out a poster for each group.
2. Explain that you have a list of clues that the students will need to find the answers to, from the poster. You will read out the clues and the students will raise their hand to answer.
3. Clues for the students:
 - a) I am a plant that emerges out of the water. I help filter the water, and muskrats use me to help build their lodges. I look like a hotdog on a stick. What am I?
Cattail
 - b) I sing my song while sitting on a cattail. I like to build my nest in the reeds and cattails. Watch out for my colourful red and yellow wings. Who am I?
Red-winged Blackbird
 - c) I am a large mammal who loves to feed on the plants found in wetlands. My long legs make it easy for me to travel through water, and my long nose makes it easy for me to grab the plants underwater. Who am I?
Moose
 - d) I am a bird with long legs, a crest on my head, and a long yellow bill. My favourite foods are fish, frogs, salamanders, insects and plants. I move slowly when I hunt. Who am I?
Great Blue Heron
 - e) I look like a beaver but my tail is very different. I do make a lodge, but out of cattails and mud. Who am I?
Muskrat
 - f) You see me flying in a “V” with my friends, and I am sure you have heard me honking! Both males and females look alike. Who am I?
Canada Goose
 - g) I live both on land and in the water. I eat fish, worms, small rodents, small birds and amphibians. I am long and skinny with a yellow stripe and slither on the ground. Who am I?
Garter Snake
 - h) I am a plant that is purplish-pink and tall. I really shouldn’t be in a wetland, so I am considered a weed. What am I?
Purple Loosestrife



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- i) I am a tree that never loses its needles. I am tall and my smell might remind you of Christmas. Even though I have the word “black” in my name, my needles are still green. What am I?

Black Spruce

- j) I buzz around on four delicate, transparent wings. I have a long body and a large head, and I love to hover over the water. Who am I?

Dragonfly

- k) I am an aquatic bird that loves to make wetlands my home. Males have a ring around their neck, while females are very well camouflaged. Who am I?

Mallard Duck

- l) I make a hoot, hoot, hoot call in the evenings and all through the night. I am a very impressive bird of prey with large yellow eyes and amazing hearing. I usually eat rodents but will also try to eat other birds and small mammals. Who am I?

Great Horned Owl

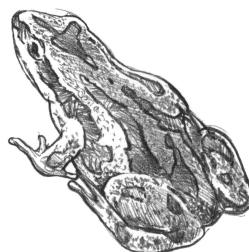
- m) Some might think I am a spider but I just look similar. I live on the water and stride around all day long, trying to avoid being eaten by fish! Who am I?

Water Strider

Extension

You can make clues to these other plants / animals found on the poster, or have your students make their own clues and present them to the class.

- Marsh Marigold
- Trumpeter Swan
- Western Blue Flag
- Backswimmer
- Larch
- Pitcher Plant
- Balsam Poplar
- American Coot
- Leopard Frog
- White-throated sparrow
- Horsetail
- Labrador Tea
- Dark-eyed Junco
- Sundew Plant
- Iris
- Red Fox
- Fish



**Objective**

Students will develop an understanding of common wetland plants, animals, zones and habitat through a dictionary scavenger hunt.

**Curriculum Connections**

5-10-1, 5-10-3, 5-10

**Time**

30 minutes

**Materials**

- Wetlands posters
- Dictionaries for each student
- Pencils, worksheet

**CD**

Refer to the folder “Wetland Words” for student worksheet.

**Procedure**

1. Hand out the student worksheets and dictionaries. Tell students they will work independently to search for the wetland words on their worksheet.
2. Students will follow the instructions on the worksheets to locate their wetland words. They can hand in their worksheets or take up as a class.





Procedure

1. Have students brainstorm what they think a wetland is, drawing on their experiences from Activity 1: Can You Spot Me? They can write their ideas on a sheet of scrap paper, or you can write them on the board for later reference.
2. Explain what a wetland is, and how it is interconnected to the water we use and have in Alberta. Identify the following:
 - The types of wetlands found throughout Alberta
 - The upland, riparian zone and aquatic zone and their significance
 - Interactions among living and nonliving things in a wetland

The video “Wetlands Wonderlands” can help provide more information on wetlands and is a great resource for students to watch.

3. Hand out “What in the World is a Wetland?” information sheet for students to read. You can read aloud, or have students read individually (language curriculum connection).
4. Organize students into groups of four and as a class, copy down the criteria list for the mural they will make:
 - Title of the TYPE of wetland they will create, group names
 - Label the upland area, riparian zone and aquatic zone
 - A minimum of 3 different plant species found in their wetland
 - A minimum of 3 different animal species found in their wetland
 - One threatened plant and animal (species at risk)
 - Interesting facts attached to the mural
 - At least one life cycle of a dragonfly, caddis fly, may fly or frog
 - Ensure the mural is neatly labelled and coloured
5. Give each group a piece of mural paper approximately 25 inches X 16 inches in size. Students can refer to the internet, an encyclopedia, their information sheets, books and posters to assist with labelling their wetland. Making the mural may take two or more classes, depending on the length of time you assign to the task.



Objective

Students will understand and differentiate between the different types of wetlands, specifically a bog, fen, marsh and swamp. Students will also identify the three components of a healthy wetland ecosystem: upland habitat, vegetative buffer (riparian zone) and aquatic zone.



Curriculum Connections

5-10-1, 5-10-2, 5-10-3



Time

135 minutes
(approximately 3 classes)



Materials

- Wetland terms, information sheet
- Mural paper, pencil crayons, markers, paints, glue etc



CD

Refer to the folder “What is a Wetland” for background information, student information sheet and terms to define; a *sensory (imagination) activity* is also included in this folder as an extension.



Objective

Students will learn about the significance of watersheds and how they are connected to wetlands. They will be able to identify the functions of watersheds, the role wetlands play in a healthy watershed, and how human actions can affect watersheds and wetlands.



Curriculum Connections

5-10-2, 5-10-9, 5-10-10



Time

45 minutes



Materials

- Shallow baking pan
- Small cups, tape
- Aluminum foil or plastic baggie
- Dark-coloured (powder) fruit drink mix
- Small pieces of sponge
- Water (and a glass to keep it in)



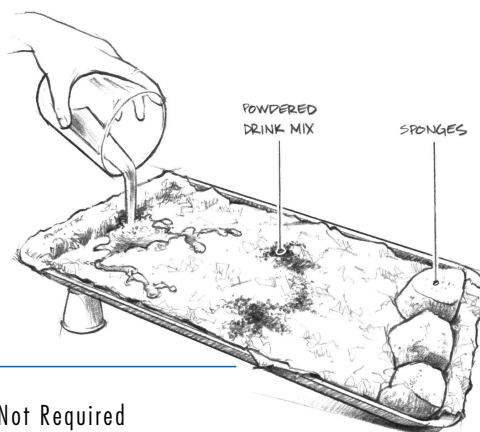
CD

Refer to the folder “Wetlands and Watersheds” and read the information on watersheds.



Procedure for Demonstration 1: Making a Model Watershed

1. Tape the small cups to the underside of one end of the baking pan and prop this end up on a flat surface (table).
2. Tear of a piece of aluminum foil the size of the pan. Crinkle the foil slightly and use it to make a basin in the low end of the pan. In this model watershed, the high end represents a mountain range, like Jasper, while the sponges represent wetlands. The basin is a large body of water (lake or bay) into which the river flows.
3. Set the sponge pieces in the low end of the basin; this represents the wetlands and how they act like “nature’s sponges.”
4. Pour “rain” over the top end of the watershed and see what happens. Sprinkle in some of the powdered drink mix (represents contaminants or pollutants) in various locations around the watershed.
5. Ask students to imagine how the land might be used in each location (e.g. farming, mining, forestry, oil and gas development, urbanization etc) and how contaminants/pollutants might affect the watershed and wetland.
6. Remove the sponges and make it rain again. Now what happens? Ask students:
 - What happened to the watershed before we removed the wetlands? After we removed the wetlands? Where does most of the water end up before removing the wetlands? After?
 - Does the water take the same path every time?
 - How might wetlands affect the rate of flow of water? Slow it down? Speed it up? What effect might this have on land around wetlands?
 - Did pollutants get into the watershed (were they absorbed)? What can we do about them?
 - What can we do to help protect, conserve or enhance wetlands?





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Extension

Have students write out their answers to the above questions. Ask students to research the watersheds of Alberta (refer to the CD folder “Wetlands and Watersheds” and print off the River Basins of Alberta map), or use the River Basins of Alberta map as a puzzle and have students piece each together. Ask, where are most wetlands found in Alberta and why are they important?





Materials

- Baking pan
- Ice cubes
- Sand or other fine material



CD

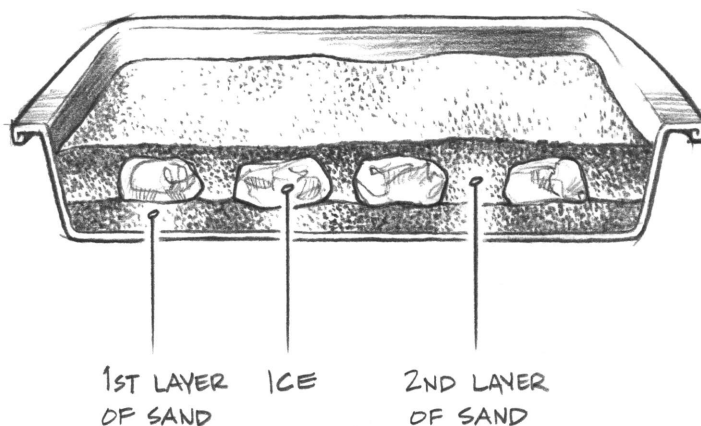
Refer to the folder “Wetlands and Watersheds” for information on how prairie wetlands formed.



Procedure for Demonstration 2: How Were Prairie Wetlands Formed?

Note: this can be prepared in advance and stored in a freezer.

1. Cover the bottom of the pan with a layer of sand.
2. Place a few ice cubes in the pan on top of the sand.
3. Completely cover the ice cubes with sand.
4. Leave the pan exposed to room temperature and watch the depressions form and change with time, as the ice melts.
5. Explain to students that this is how prairie wetlands formed.
6. Ask students:
 - When we alter the landscape, how does it adapt? Can it adapt?
 - When designing subdivisions, industrial sites and highways, do we consider the natural landscape? Should we?
7. Ask students to point out the uplands, riparian and aquatic zones.



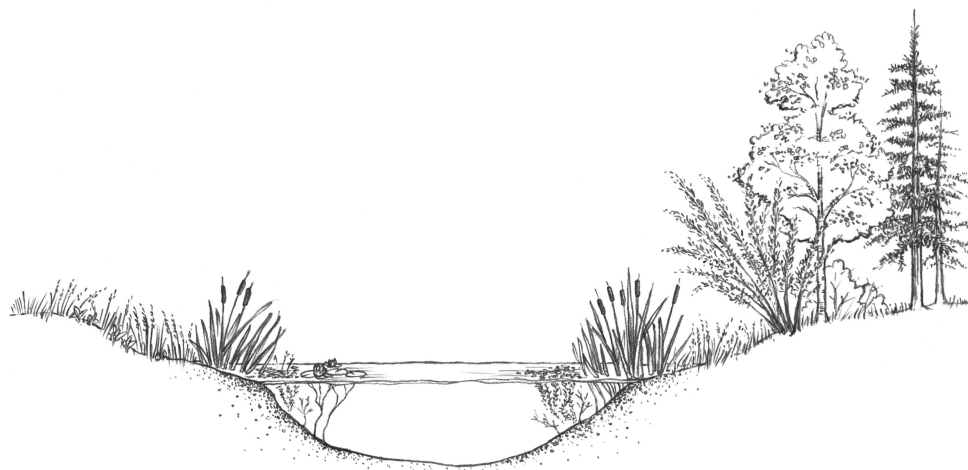


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Extension

Allow time to pass so the wetlands can completely dry out, leaving only the wetland depressions in the sand. Tell students that this passage of time reflects the changing seasons where the amount of water in a wetland can decrease during times of lower precipitation (e.g. drought in summer or fall, lack of rain in spring, lack of snow during winter). Explain this is relatively a natural process, however, human activities on the land and in the water are affecting the recharge rate and amount of wetlands. Ask students why it is important that we regulate and control how much water we use, and reduce or omit pollutants from water? Now pour water back into the pan and ask students to explain what has happened.





Objective

Students will learn about the significance of wetlands throughout Alberta and Canada, as well as the rest of the world.



Curriculum Connections

5-10-1, 5-10-5



Time

25 minutes



Materials

- Map of Alberta, Canada and world (can use an atlas)
- Refer to internet, books, encyclopedias etc for information on wetlands around the province, country and world (a good book is *Our Wild Wetlands* by Sheila Cowing, 1980)



CD

Refer to the folder “World of Wetlands” for some Canadian wetlands examples, and links to websites.



Procedure

1. Give some examples of wetlands found in Alberta (e.g. Wagner Bog), in Canada (e.g. Oak Hammond Marsh, Manitoba) and in the world (e.g. Mangrove Swamps, Florida, USA, marshes and bogs in Siberia etc).
2. Have students first choose an area in Alberta to research wetlands. They must find one wetland and identify the following:
 - Location in Alberta
 - Closest city, town or community to the wetland
 - If it is a recreational area (e.g. has walking trails)
 - An animal and plant that calls this wetland home
 - The importance of the wetland in their region (e.g. to local communities, to wildlife, for peat etc)
3. Students will use maps, the internet, books etc to research their wetland in Alberta.
4. Follow the same procedure for wetlands around Canada (in a province other than Alberta) as well as the world. Students should have three different wetlands to compare.
5. Ask:
 - What similarities or differences exist between the different wetlands?
 - How are the wetlands important for each area? (e.g. provide habitat, recreational area, important for local communities etc)
 - Are the wetlands protected in each area? Why or why not? Should they be?
 - What can you do to help protect, conserve or enhance wetlands in your local area?



Part II: Wise About Wetlands



Investigations and Comprehension



In Part II students will:

- Experiment and discover the characteristics of wetlands
- Better understand the concept of pollution and how it affects a wetland ecosystem
- Develop a greater appreciation for plant and animal life that inhabit wetlands
- Understand animal and plant adaptations and their significance
- Develop a deeper appreciation for interconnectedness through the use of food chains/webs
- Become aware of the functions and values of wetlands





Objective

Students will learn through a series of experiments they can conduct on their own:

- how decomposition occurs in wetlands,
- how aquatic plants breathe,
- how water is filtered and absorbed in wetlands,
- how plants can help purify water, and
- how pollution can affect a wetland ecosystem.

This activity is similar to a lab report design and can be used as such for assessment purposes (with a rubric).



Curriculum Connections

5-1, 5-2, 5-10-2, 5-10-6,
5-10-9, 5-10-11



Time

220 minutes
(approximately 4 classes)



Materials

- Two dead leaves
(about the same size)
- Two pencils
- Two glass jars
- String
- Water for a wetland
- Tap water



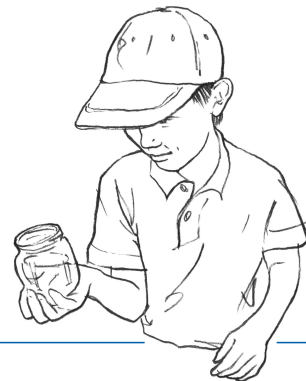
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Refer to the folder “Wetland Wonders” for the student worksheets and background information.



Procedure for Experiment 1: Decomposition (per group of 4 students)

1. Tie the string to the stem of each leaf. Tie the other end of the string to the middle of the pencil.
2. Fill one jar with the tap water and one jar with the wetland water. Label each jar.
3. Place the first leaf into the jar with wetland water, with the pencil across the top of the jar (to keep the leaf suspended).
4. Please the second leaf into the jar with the tap water, in the same way as the first leaf.
5. Record the date and time that the leaves went into the water and over the course of two weeks observe the leaves daily, at the same time if possible, and record all observations into the worksheet provided on the CD.
6. Ask the students:
 - What do you think has happened to the leaf and why?
 - What water type is decomposing the leaf faster?
 - Why do you think this is happening?
(explain that decomposition happens much slower in a bog or fen because of lack of oxygen, bacteria, other microorganisms and high acidity – it almost acts to preserve the plant or animal matter!)





Procedure for Experiment 2: Living, Breathing Plants

A good suggestion is to have two plants for this experiment so that groups of students can observe the two experiments, and record any possible differences between them. Students will observe the two plants in the room over three days. You will have them help set up the experiments, or can set up on your own.

1. Fill the bowl with water almost to the top.
2. Fill the test tube with water and stop it with your thumb while you put it upside down into the bowl almost full of water.
3. Push a runner of live plant into the test tube while it is still held upside down under water.
4. On the opposite side of the plant, put a runner of live plant into the plastic baggie and tape the baggie shut around the runner (while it is still attached to the whole plant – be careful NOT to break off the runner of live plant!).



5. Put the bowl into indirect sunlight in the classroom. Ask students to record the time and day you began the experiment. Then have them record their initial observations of the test tube and baggie:
 - Is the test tube still filled with water? Is the plastic baggie wet on the inside? Does the plant look healthy?



Materials

- 2 Spider plants (or other small-vined plants)
- Test tube or jar (e.g. mason jar)
- Bowl
- Water
- Clear plastic baggie and tape

6. Have students record their observations of the test tube water level and baggie moisture the next day, at the same time. Repeat for one more day and ask:
 - What happened to the level of water in the test tube? What happened to the moisture in the baggie? Does the plant still look healthy?
7. Explain that the water level in the test tube gets lower everyday because the plant produces oxygen and pushes out the water, so there is oxygen in the test tube! The moisture in the baggie is a result of transpiration! Discuss the relationship we have with plants and include the many ways we use plants in our everyday lives (e.g. agriculture – food, forestry – fibre, habitat, recreation, regulate natural water flow and levels and produces oxygen).



Extension

As part of the lab report, have students explain three different relationships THEY have with plants and how their life would be different if those plants were no longer around.



Materials

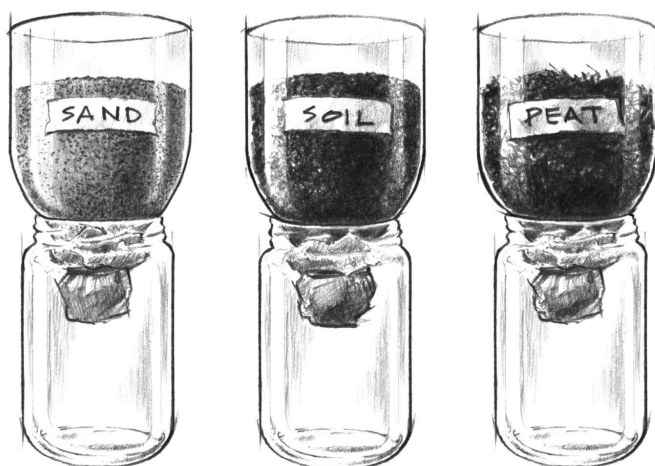
- 3 - 2 L plastic pop bottles for each group of students; cut in half with spout intact
- Tape
- J-cloth
- Measuring cup, ruler (or measuring tape if enough to share)
- 3 elastic bands for each group
- 3 clear wide-mouth jars (e.g. mason jars) for each group (ask students to bring in their own, or ask other teachers to borrow some!)
- Dry sand, garden soil and peat (available at most gardening stores)
- Water



Procedure for Experiment 3: Water Filtration and Absorption

1. Cut the pop bottles in half, leaving the spout intact so that it can be placed into the jars. It is suggested you cut the bottles, rather than students. Students can complete the remaining steps.
2. Place a piece of J-cloth over the spout of each bottle and secure with an elastic band. Turn each bottle upside down in the jars.
3. Label the three bottles as Sand, Garden Soil and Peat. Partially fill the three bottles with the three different materials.

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4. Slowly pour approximately 250 ml of water into one of the bottles. Use a watch to time the rate of flow (how long it takes for the water to go through the soil and into the jar) for ten minutes. Have students record the time onto their worksheets, and measure the amount of water in the jar (using a ruler).
5. Repeat this step for the remaining two jars and have students record their observations.
6. Use the following formula to determine how much water each soil type absorbed:

250 ml – amount of water in jar = amount of water absorbed by the soil

7. Ask the students:
 - Which soil absorbed the most water? Which did not?
 - Why do you think peat may have absorbed more water than the sand or garden soil? Which soil would be the best for planting flowers or crops in? Which soil do you think farmers might prefer?
 - Why might the farmer's preference of peat be detrimental to wetlands?



Materials

- Stalk of celery for each group
- Water
- Beaker or glass jar (needs to be sturdy to hold up the celery) for each group
- Red food coloring



Procedure for Experiment 4: Plant Purifier

1. Ensure the celery is cut, and it has the leaves intact. Give each group a stalk of celery and ensure they **DO NOT** eat it! Record observations of the celery: colour, condition, smell etc.
2. Give each group a glass jar and have them fill the jar 2/3 full with water. Have students record their observations of the water (is it clear, colourless, odourless).
3. Add in several drops of red food coloring, so that the water is darkly coloured and record observations now.
4. Have the students put the celery stalk into the water and record the time and day the celery went in the water.
5. The following day, at the same time, have students make observations about their celery: the color, condition, etc as well as the water level in the jar. Repeat for two more days (total of four days).
6. Record observations after four days and discuss and record the findings:
 - What happened to the celery?
 - What happened to the water level?
 - Where did the water go after it was taken up by the plant?
(some has transpired, some was used in metabolic processes, some was transformed into less harmful substances and some remains in the plant until it dies)
 - Do you think the celery was able to purify the water (remove some of the dye)? Why might you think this?
 - Do wetlands do this (remove impurities from the water)? Why is the beneficial and important? (cattails do this!)





Procedure for Experiment 5: How Does Pollution Affect Plant Life?

1. About 2 weeks in advance have the class label the jars 1 to 6, fill them with tap water and set them in front of a window. The two week time frame allows the water to off-gas any chlorine or other chemicals. (Or, for a more realistic model, try using pond or wetland water and include a bit of soil in the jar!)
2. Record observations of the water after two weeks have passed. Note the color and smell of the water. Also record the time of day and date the experiment officially began.
3. Add one teaspoon of fertilizer to each of five jars (the sixth jar will be the control), stir, wait one minute and record observations.
4. Ask the students to brainstorm the types of pollutants that can get into our wetlands and affect our water supply. Have students record these ideas on the board or on a piece of chart paper.
5. Explain that three of the jars will represent household pollutants, one jar will represent excess pollutants, one jar will represent excess fertilizer and one jar will be a control (with no fertilizer or pollutants added). Have them record this information on their observation worksheet (e.g. 1 = bleach, 2 = cleaner, 3 = oil, 4 = excess fertilizer, 5 = excess pollutants, 6 = control).
6. Add 4 tsp bleach to #1 – bleach jar. Add 4 tsp household cleaner to #2 – cleaner jar. Add 4 tsp lubricating oil to #3 – oil jar.
7. Add duckweed to jars #1 – 3 and ask students to make predictions of what happens to the duckweed in each of the three jars. Have students write their observations on their worksheets.
8. Add 4 tsp EACH of bleach, cleaner and oil to the #5 – excess pollutant jar. Add 3 tsp fertilizer to #4 – excess fertilizer jar. Do not add anything to the #6 – control jar.
9. Add duckweed to jars #4 – 6 and predict what will happen. Write observations on worksheet.



Materials

It is suggested that for the quantity of materials required, as well as the type of materials, this experiment should be led by the teacher. However, small groups could each have a jar to observe, and the class could compare and record each other's results as the experiment progresses.

- Approximately 5 L of aged tap water for each jar (let it sit for approximately 48 hours in the open; you may need a pail to store it in)
- Light source from a window
- Teaspoon (measuring spoon)
- Six glass jars approximately 1 L each
- Duckweed or algae (from local pet store; enough for five of the jars)
- Bleach
- Lubricating oil (e.g. motor oil or baby oil)
- Common household cleaner such as Mr. Clean
- Plant fertilizer
- A marker and tape to label the jar
- Chart paper and markers



NOTES

10. Observe the jars every day for five days and record observations for each day. Ask:

- What has happened to the water in each jar? To the duckweed in each jar?
- How does this represent pollutants in our environment now, and how would these pollutants affect the health of a wetland ecosystem?
- If there is an algae bloom with excess fertilizer, could this really happen and what effects would it have on a marsh or swamp?
- Why might the oil in the jar be less harmful than the other pollutants? How would the oil still be harmful to other plants or wildlife?
- What can we do to ensure wetlands remain pollutant free?
- How would you safely dispose of polluted water?

**Extension**

You could test the acidity of the water using pH indicator strips, and compare the results from each jar.





Procedure

You can have students briefly review the chart found on the CD in the folder “Living in the Wet” before participating in this activity. However, for more of a challenge, this activity is designed to review the adaptations after the activity has been completed.

1. Set up the classroom into stations with the different species’ pictures found on the CD.
2. Assign students in groups of two and, with a pencil and piece of paper, have them move around the stations attempting to answer the questions about adaptations provided:
 - What does this animal eat?
 - How is it suited to eat this particular food?
 - What part of the wetland is this animal / plant able to live in (e.g. water, land, both)?
 - What special things does this animal / plant have so that it can live in a wetland (e.g. water-resistant fur, webbed feet, tail like a paddle, feathers, funnel-shaped leaves, tiny openings in leaves, ability to store lots of water etc)
3. Have the students rotate to a new station every 2-3 minutes.
4. When all stations have been visited, take up their answers on a piece of chart paper, listing all adaptations for both the animal and plant species.



Extension

Play the [Adaptive Measures](#) game on the next page! It emphasizes the need for specializations of physical features when animals are foraging for food.



Objective

Students will identify different animal adaptations unique to wetland ecosystems.



Curriculum Connections

5-10-4, 5-10-7



Time

35 minutes



Materials

- Paper, pencil for each student
- Chart paper, markers



CD

Refer to the folder “Living in the Wet” for background information on various species and adaptations.



Materials

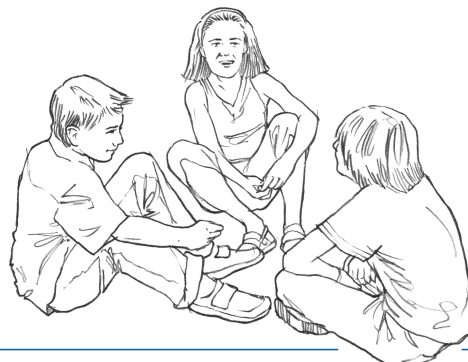
- Two medium sized bowls for each group of four students
- Two cups of sand (or white sugar) for each group
- 20 dried red kidney beans for each group
- 2 straws (large and straight) for each group
- 1 fork and 1 spoon for each group
- 1 set of wooden chop sticks for each group



Procedures for the Adaptive Measures Game

1. Pour the sand into one bowl and mix in the red kidney beans.
2. Tell the class they need to determine the best adaptation to find the food (kidney beans) in the sand.
3. Each student must choose the straw, fork, spoon or chopsticks to retrieve their food from the sand. One student at a time can attempt to retrieve their food when you say "GO!"
4. Time the students for 30 seconds, and tell them to keep their food in their own pile. Have them count their kidney beans after each student has attempted to retrieve their food.
5. Ask the students:
 - Was it easy or difficult to retrieve your food with the tool you were using?
 - How might animals need to adapt to their environment to maximize their survival chances?
 - Do you think it is difficult for animals to adapt to a rapidly changing environment?
 - How can we make a difference in how the environment is changed, so that animals may not need to adapt so quickly?

(Idea modified from: Alberta Parks and Protected Areas, Fish Creek Provincial Park, 13931 Woodpath Road, S.W. Calgary, AB, T2W 5R6)





Procedure

1. As a class, brainstorm a list of plants and animals that live in or use wetlands and write all ideas on the board. Ensure you have enough plants and animals for each student in your class (you can refer to the CD folder “Who Eats Whom” for a list of ideas).
2. Assign items to individual students and give them enough time to research their plant or animal on the internet (approximately 30 minutes to research and write).
3. They must answer the questions:
 - Am I a producer, consumer or decomposer (they must define all terms but identify their plant or animal as only one)
 - What eats me, or what do I eat (predators)?
 - Where do I live in the wetland (habitat)?
 - What relationships might I have with other plants or animals (if known)?
4. When students have their answers, hand out a white cue card to each student to write their animal or plant name on the FRONT, and if they are a producer, consumer or decomposer on the BACK (approximately 30 minutes to play the game).
5. Once they have done this, have them tape their cards (with their plant or animal name showing) on the front of their shirts. Ask the class to stand in a circle.
6. The teacher will be the sun, the ultimate energy source. The teacher will have the ball, yarn or string and throw it to a PRODUCER. Ensure you keep the END of YARN in your hand! Also ensure you have the scenario cards ready in your free hand (or close by) for step #9.



Objective

Students will develop an understanding of the interconnections and interactions among living and nonliving things in an ecosystem. Students will identify organisms and their role in the ecosystem.



Curriculum Connections

5-10-6, 5-10-7



Time

60 minutes
(for brainstorm, research and activity)



Materials

- Pencils, paper for each student
- Small white cue cards
- Markers
- Ball of yarn or string



CD

Refer to the folder “Who Eats Whom?” for background information.

NOTES

7. The producer will then hang on to a portion of the yarn and pass the ball to another student, a CONSUMER. Repeat for a decomposer and continue on through the group, so all students will have a piece of yarn in their hand. Students can receive the yarn only TWICE, so each of their hands has a portion of yarn in it.

8. Everyone should now have yarn in their hand(s). The food web has been constructed! Ask the students:

- What would happen if one of us let go of their yarn?
- What would happen if three or four of us let go of our yarn?

Briefly discuss how we are interconnected and interdependent with each other, and how this interconnection makes the whole system function healthfully.

9. From the scenario cards, ask the students the “what if...” questions and have them act accordingly (refer to the CD folder “Who Eats Whom” for scenario cards).

10. Observe what happens if and when the yarn is pulled. Discuss the scenarios and relate how we are all interconnected to the environment.



Extension

While still holding the yarn, ask the students what would happen if you removed some of the producers from the food web. Have two producers completely drop their yarn. What are the effects? Now have the consumers who were connected to those producers completely drop their yarn. What happens now? Explain that everything is interconnected and interdependent; if one organism disappears from the food web, other organisms are affected and the system may fall apart. Ask the students how they think this might happen in “real life”, and then ask them what we can do to help prevent this from happening.



Part III: Wetlands Field Trip



Review and Investigations



In Part III students will:

- Explore various concepts related to wetland ecosystems and learn to describe what a local wetland is
- Develop an understanding for life in a wetland
- Deepen their awareness and understanding of interconnections and interdependencies through food webs and life cycles
- Develop an understanding of how human actions can affect the health and functioning of wetland ecosystems
- Develop an understanding of the values associated with wetlands

The following 6 activities are designed as a field trip and are intended to take approximately 2 hours to complete. It is suggested you reserve a half day for this field trip, depending on travel time, to provide students with ample time in the wetland. Have students pack a lunch and snack, and wear appropriate clothing for wetland field studies (e.g. rubber boots, jacket, hat, sunscreen, insect repellent etc depending on the weather/season). A student field trip booklet is included on the CD, in the folder “Wetland Field Trip.”





Objective

Students will describe a local wetland, learn to draw and interpret food webs and/or chains, identify life cycles of invertebrates, recognize that some aquatic animals use oxygen from the water and understand that human actions can effect the balance of wetland ecosystems.



Curriculum Connections

5-1, 5-2, 5-10-1, 5-10-2,
5-10-3, 5-10-5, 5-10-7,
5-10-9, 5-10-11



Time

Variable



Materials

- School permission forms, volunteer forms (if applicable)
- Wetlands information on sites to visit
- Bus (booked for trip)
- Pre-trip teacher visit to wetland site (if applicable)



CD

Refer to the “Wetlands Field Trip” folder for field trip planning tips. For background information on field trip activities 10, 11, 12 and 13 refer to the corresponding sub-folders.



Procedure Pre-Trip

1. Ensure you have the bus booked for the field trip. Additionally, ensure you have contacted the wetland you will be visiting. It is a good idea to visit the wetland prior to bringing your class there, to familiarize yourself with boundaries, safety issues etc. You may want to inquire if there is a wetland guide that could lead you through the site, both during your visit and on the field trip day.
2. In class, introduce students to the concept of field notes and how to take them.
3. Review safety procedures and instil a “buddy system” (pairs of students that must stay together at all times). Record a list of the “buddy” pairs for future reference (and head counts). Also review behaviour expectations.
4. Ensure letters home (permissions, volunteer requests etc) have returned to you, signed and completed.
5. You may want to review wetland terms, such as plants, invertebrates, riparian and aquatic zones etc prior to departing on the trip.

Handling Frogs

Frogs are not animals to pet. Frogs and toads should not be handled frequently or, preferably not at all. If students are handling frogs, use extreme care. It is best to gently grasp the shoulder blades with a thumb and forefinger. Be careful not to squeeze the abdominal area and be careful not to allow the frog to slip from the grasp. Touch frogs with wet hands clean of all sunscreens, lotions and insect repellents, which can be harmful to frogs, tadpoles and eggs. Be aware that handling frogs, turtles and snakes may transmit salmonella (a bacterium related to typhoid). Wash hands after handling.

They Have Extraordinary Skin

Frogs are special animals with delicate skin. Any foreign residues on human hands will affect their skin.

- They breathe with their lungs and also through their skin by absorbing oxygen from the water.



- Frogs, toads and salamanders drink with their skin rather than their mouths. They have a highly vascular patch of skin on their belly and groin area called the “seat patch”, which they use to drink the water that they sit in.
- Because they live on the edge between water and land, they are sensitive to pollution and other environmental changes.
- Amphibians cannot tolerate the high salt content of sea water and are the only vertebrate that does not live in marine habitats.



Procedure for the Field Trip

1. When you arrive at the wetland, review the rules and expectations for the day.
2. Tell students that you will first enter the wetland area absolutely SILENT. This will leave wildlife undisturbed, and allow students to observe life in the wetland.
3. Ask students to buddy-up and find a close but quiet location to sit, listen and watch without speaking. Time the students for five minutes.
4. After the five minutes are up, call the students back and ask them what they heard or saw. What kind of diversity is in the wetland?
5. Now introduce students to their surroundings and explain that they are in a community, just like a human community. Explain that they must respect the wetland area and all that live in it, and leave no trace that they were visiting (no littering, picking flowers etc). Also explain that all life in the wetland is to be handled with utmost care if and when students go to the water. Nothing should be harmed.
6. Prepare students for Activity 10.



Time

15 - 20 minutes



Materials

- *SQUISH! A Walk in a Wetland!* student booklet
- Pencils, erasers
- Ice cream buckets (for specimen holding tanks) and margarine containers (for soil investigation)
- Kitchen strainers, aquarium nets or dipping nets (D-nets work best); try a local hardware store for nets
- Magnifying glasses, binoculars if available
- Small shovels (a few will do – students can share)
- Proper attire for wetland field studies (weather/season dependent)



CD

Refer to folder “SQUISH” for SQUISH! student booklet and print one copy per student.

Teacher Tip: Using the *SQUISH!* student booklet make your own notes for teaching the activities onsite.



Objective

Students will be able to identify wetland soils



Curriculum Connections

5-10-2, 5-10-6, 5-10-9



Time

15 minutes



Materials

- *SQUISH!* student booklets (from CD)
- Pencils, erasers
- Small shovels (share)
- Margarine containers



Procedure

1. If permissible in the area you are visiting, have students dig a small hole near the water's edge, and another further upland, closer to vegetation.
2. Gather some soil in each of the containers and make sure you know what one is which. Compare the soil in the two containers. Ask:
 - Is the soil similar in colour or different? How? Is it darker or lighter? Is it green, brown, black or grey?
 - Does the soil smell? What does it smell like? Eggs (Sulphur)?
 - What is the texture like? Is it mushy or solid, crumbly or slimy?
 - Are there earthworms in the soil (be careful if there are!) or not? (lack of worms would mean soil is too wet and they would not be able to breathe)
 - Do you see water in the soil? Is there a lot or a little, or none at all?
3. Ensure students are recording all of their information into their student booklets.
4. Prepare for Activity 11.





Procedure

1. Have students review what categories of plants are commonly found in a wetland.
2. Have students disperse around the wetland, and using their booklets, seek out, identify and describe the three categories of aquatic plants.
3. Ensure students stay in their “buddy pairs” and adhere to safety rules and expectations.
4. Prepare students for Activity 12.



Objective

Students will identify the categories of aquatic plants commonly found in wetlands: submergent, emergent and floating plants.



Curriculum Connections

5-10-3, 5-10-4



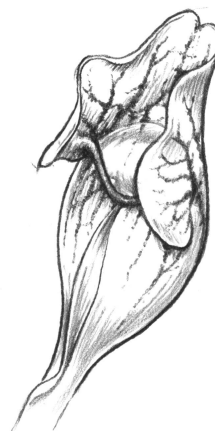
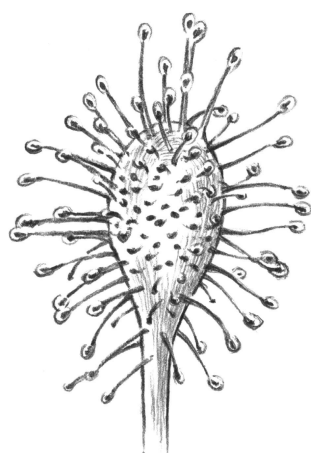
Time

15 minutes



Materials

- *SQUISH!* student booklets (from CD)
- Pencils, erasers





Objective

Students will be able to identify what an invertebrate is, its adaptations and role in a wetland ecosystem and how human actions might affect invertebrates.



Curriculum Connections

5-10-3, 5-10-4, 5-10-9



Time

20 minutes



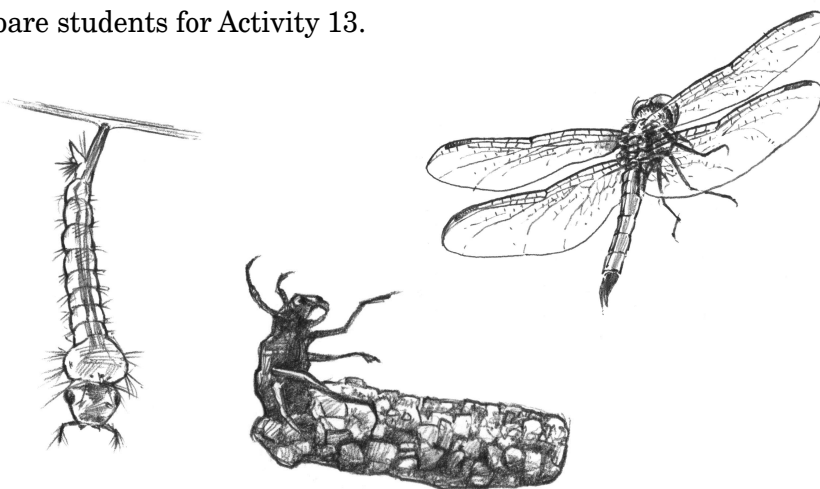
Materials

- **SQUISH!** student booklets (from CD)
- Pencils, erasers
- Ice cream buckets (for specimen holding tanks) and margarine containers (for soil investigation)
- Kitchen strainers, aquarium nets or dipping nets (D-nets work best); try a local hardware store for nets or make your own (on CD)
- Magnifying glasses



Procedure

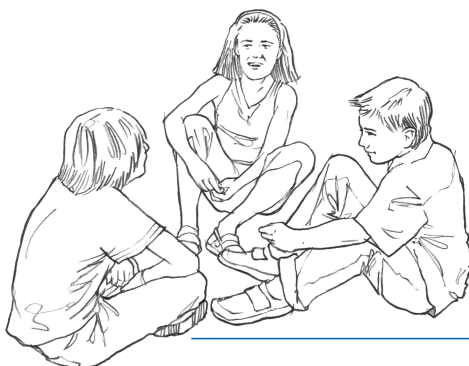
1. Ensure students follow these rules: always put invertebrates directly into the specimen holding tank (full of water) as soon as they have been taken out of their natural environment (e.g. pond); they need to breathe! Be very careful when handling any invertebrate, they are very delicate! Only put invertebrates into the specimen holding tanks; try to keep leaves and soil out!
2. Have one student (who is NOT holding then net) go to the water's edge and carefully fill their specimen holding tank (ice cream bucket) with water. Do not let leaves or mud get into the holding tank.
3. To capture invertebrates, have ONE student from a "buddy pair" stand near the edge of the water very carefully, holding the net. Tell them to slowly put the net in the water and scoop up any invertebrates they may see swimming around.
4. Students must not try to splash, or dig into the mud underwater, as this will cloud the water and you will not be able to see invertebrates.
5. Once students have something in their net, quickly bring it to the specimen holding tank and turn the net upside down. **GENTLY** shake out the net, or swish it in the holding tank, to loosen the invertebrate into the water.
6. Once there is an invertebrate in the holding tank, observe it and record all observations into the student booklet.
7. Prepare students for Activity 13.





Procedure

1. Gather students into a circle for a brief discussion on the importance of a healthy wetland.
2. Ask students to look from where they are sitting, for signs of disturbance and conservation actions in the wetland, and silently think about the implications.
3. Now ask student to explore the wetland, in their “buddy pairs” for signs of disturbance and conservation acts. Record their findings in their booklets, as well as sketch the wetland area and label it for disturbances/conservation, and answer any related questions.
4. Prepare to board the bus and leave the wetland. Remember to leave the wetland better than you found it, so if there is any trash etc, pick it up and dispose of it properly.



Objective

Students will be able to identify human disturbances and acts of conservation in the wetland, and assess the status of the wetland.



Curriculum Connections

5-10-9, 5-10-10, 5-10-11



Time

15 minutes



Materials

- *SQUISH!* student booklets (from CD)
- Pencils, erasers



CD

Refer to the folder “Assessing Wetland Health” for background information.



Objective

Students will review what they have learned during the wetland field trip.



Curriculum Connections

Review “Wetlands Field Trip” curriculum connections



Time

Variable



Materials

- *SQUISH!* student booklets (from CD)



Procedure

1. On returning from the field trip, either the same day or next day, have students take out their booklets.
2. Go through the booklets to discover what the students found, and to ensure that all areas have been answered. If unanswered, fill in as a class.
3. You can simply gather the booklets and use this as an assessment tool, or have students write a story or short paragraph about their experiences at the wetland, including:
 - Their favourite plant, invertebrate and vertebrate (e.g. bird, fish, frog, beaver etc)
 - The importance of soil type in the wetland (what plants it enables to grow, where they can grow etc)
 - The importance of invertebrates in the wetland, as well as vertebrates
 - How food webs are interconnected and the importance of maintaining a healthy balance
 - The importance of the health of the wetland
 - Conservation actions humans can take, and why this is important
4. You can also have students prepare a piece of artwork from their wetland field trip, taken from their sketch of the wetland in their booklets.
5. You may also want to review terms from the wetlands unit.



Part IV: Wetlands Issues



Critical and Reflective Thinking

In Part IV students will:

- Learn about wetland issues and begin to form opinions, make decisions and take actions regarding issues
- Become aware of threats to wetlands
- Identify some of the species at risk in wetlands
- Become aware of ways to help conserve, protect and enhance wetlands



Indoor



Outdoor





Objective

Students will identify human impacts on wetlands, and how our actions can threaten the health of wetlands.



Curriculum Connections

5-10-9, 5-10-10, 5-10-11



Time

30 minutes



Materials

- Yarn or string approximately 4 meters long (this is the timeline)
- Clothes pins to secure the task cards on the timeline
- Tape



CD

Refer to the folder “Changing Attitudes” for the Changing Attitudes Timeline.



Procedure

1. Photocopy the Changing Attitudes Timeline document found on the CD in the folder entitled, *Changing Attitudes*. Cut apart the 20 wetland information cards. Each card has a time period (geological time or human history) along with information about wetlands development and/or information of human history and how it is connected to wetlands.
2. Ask students if they think people have any attitudes or opinions about wetlands. What could those be? Do attitudes and opinions always stay the same? What causes our attitudes and opinions to change?
3. Hand out the information cards; some students may pair up and share a card. You may choose to have students pin their information card to a four-meter string clothesline using clothespins or have students organize themselves into the timeline without talking.
4. When they think they have got it right, have them say aloud the dates to double check the timeline’s accuracy.
5. Have students read the card’s date again and information beginning from the earliest to modern time. Have all students listen to how wetlands developed and how human attitudes towards wetlands changed through history.
6. Review with the following questions:
 - How were wetlands formed over geological time on planet earth?
 - What did you notice about the changes in human attitudes about wetlands over time?
 - How have we changed our views about wetlands?
 - Why do you think these changes are important? Will the changes have a positive or negative impact on the wetlands?
 - What can you do about changing people’s attitudes towards wetlands?
 - Do you think our attitudes about wetlands will change in the future?
7. Have each student write a paragraph to summarize the learning about the development of wetlands and people’s attitudes towards them over time.



Procedure

1. Discuss the threat that Purple Loosestrife pose to wetlands. You may want to include some of the background information from the CD on a chart for students. Alternately, you can ask students to research Purple Loosestrife.
2. After students have an understanding of Purple Loosestrife and related issues, hand out white blank paper to each student. Tell them they will design an information pamphlet / brochure to educate the public about Purple Loosestrife.
3. Students can make a rough copy (highly suggested) and use this as a foundation to create their final pamphlet/brochure.
4. The pamphlet / brochure must include:
 - Title, name, date
 - At least one image of Purple Loosestrife
 - The history of Purple Loosestrife in North America
 - The appearance / characteristics of Purple Loosestrife
 - Effects on wetlands
 - Procedures for removal and community action
5. Have students hand in their pamphlet / brochures.
6. You can also have students research more / different non-native, invasive species to Alberta's wetlands and create a pamphlet / brochure.



Extension

Refer to the supplementary CD for the activity suggestion "The Duck Dilemma." This is an activity that encourages students to do some bird watching, specifically for ducks (if possible), and create a poem about the duck(s) they observe. Alternately, if no ducks are available for viewing, students can research their favourite duck and write a poem about that duck.



Objective

Student will explore the concept of "non-native species" and the issues associated with invasive species in wetlands.



Curriculum Connections

5-10-2, 5-10-9, 5-10-11



Time

30 minutes



Materials

- Paper (to make pamphlets / brochures)
- Pencils, crayons, markers, rulers etc
- Internet access



CD

Refer to folder "Purple Loosestrife" for background information and the Duck Dilemma activity.



Objective

Students will develop an understanding of the many issues surrounding the use and development of wetlands through a role-play debate, from various wetland stakeholder perspectives. Students will use research and critical, reflective thinking to provide possible solutions to the issues.



Curriculum Connections

5-10-2, 5-10-9, 5-10-10



Time

50 minutes



Materials

- “Action in the Wetlands” and “What’s Happening to our Wetlands”: articles on poster back
- Paper, pencils, internet access



CD

Refer to the folder “Wetland Dilemma” and print off the wetland map, role play cards and important background information.



Procedure

1. Have students read the poster back articles, as well as any information from the CD you feel might be necessary for the activity.
2. Print and hand out a wetland challenge map to each student, or using an overhead, display the wetland challenge map for the class.
3. Hand out the stakeholder cards and have students read their view points. You may want to group students into the various stakeholder groups. You can also decide to use all groups or select only a few.
4. Enable students to have time to research wetland issues or stakeholder viewpoints, if you would like them to develop more background information. You may need to adjust your timing if you would like them to research more information.
5. Using the guiding questions below, enable students to become familiar with their role, even if they do not necessarily agree with what their role says (this enables students to understand that there are multiple perspectives and all ideas, opinions and values need to be considered):
 - What are the benefits of keeping wetlands in the area?
 - What are the benefits of having a golf course in the area?
 - Study the map – where is the best place for the golf course? Remember that a healthy wetland is more than just water; it also includes the area of plants around the edge!
 - What alternatives or compromises can you think of to lessen the loss of the wetland and still build the golf course? Could bridges, tunnels or culverts be used?
 - Can you think of potential impacts from the users of the wetlands: ranching, grain farming, drinking water, housing, roads? How do you think these users will change the wetland?
 - What would or could you do to provide educational information to the community on the value of wetlands?

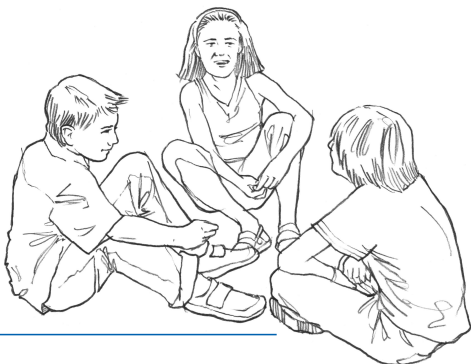


NOTES

6. After students have had time to prepare their views and opinions based on their roles, set up the class as a town hall meeting, where students will debate the management of the wetland.
7. Allow each group to present their position and information, in approximately 2-3 minutes, and then allow for questions, then rebuttals. You should chair this meeting, to maintain classroom management.
8. You can repeat this process several times if the students have a lot of information and ideas to share. This is an excellent time to take notes!
9. After all points have been pondered and discussed, using chart paper have the students provide final recommendations for their position. You can organize columns on chart paper as PROs vs CONs, or you can list each of the stakeholders final positions.
10. Debrief with the students and ask how they felt about this debate:
 - What did they learn about multiple perspectives?
 - What did they learn about the uses of, and valuing wetlands?
 - Did this activity change their opinion? Where they prompted to think about alternatives or compromises?

Extension

Have students write a formal paper (e.g. essay) that includes at least two perspectives and recommendations different than their own, and explain why they think the wetlands should be protected, why the golf course would be built, or what could be done to support both perspectives.





Objective

Students will identify various wetland species at risk in Alberta.



Curriculum Connections

5-10-3, 5-10-5, 5-10-11



Time

30 minutes



Materials

- Pencils, paper
- “Wetlands Alive” article from poster back



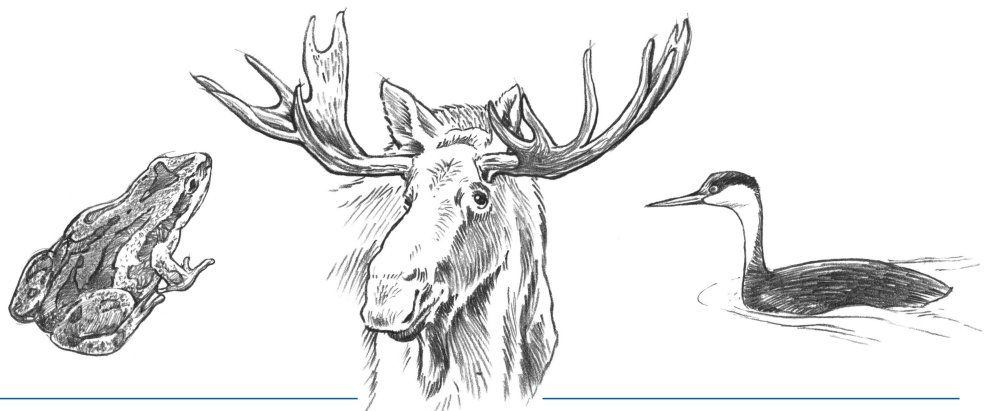
CD

Refer to the folder “Wetlands Species at Risk” for information on various at risk wetlands species in Alberta; and a KWL chart*.



Procedure

1. Students will choose a species at risk in Alberta to research, from the list provided on the supplementary CD.
2. Have students fill out the first two sections of the KWL chart.
3. Students will need to find the following information:
 - Identify the species at risk, where it lives in Alberta and what part of the wetland it inhabits
 - What are the species’ characteristics and food choice?
 - What are the causes of “at risk” status? For example, human development or invasive species competition?
 - What are some actions that have, or will, take place to help reduce the threat to the species?
 - What can you do to assist the species?
4. After students have found the above information, have them complete the final section of the KWL chart. You can have them share some of their information now, to you or the class, or wait until they have completed the final steps of this activity.
5. Now you will ask students to make a report of the species at risk, characteristics, habitat, threat(s), recommendations to reduce threat(s) and what you (or your community) can do to help this species. The report should look similar to this:
 - Species name (in Latin as well, if possible)
 - Species characteristics and habitat (including prey/food)
 - Threat(s) to the species
 - Recommendations to reduce threat(s)
 - Personal and/or community actions
6. Reports can be shared as a class or can be posted in or outside the room for others to learn about Alberta’s wetland species at risk.



* A chart that shows what the writer knows, wants to learn and has learned.



Procedure

1. Ask your students if they would be interested in becoming involved in various action projects that can help wetlands.
2. Commitments can range from creating brochures to hand out at community events, to volunteering in a wetland, to participating in online projects or receiving newsletters.
3. Use the following information to connect with a variety of wetlands action projects to involve your students.

Project Webfoot

This wetland program reaches out to many youth, grades 4-6, across the world. Its cross-curricular approach is to provide knowledge and information to students so that they have the awareness and skills to become critical decision-makers for the future of wetlands conservation.

Engaging learning materials can be obtained through Project Webfoot. For more information, visit www.ducks.ca/aboutduc/how/edu.html

Wetlands Alberta

This site provides exciting and interesting ways that youth can participate in wetlands projects across the province. There are also various resource suggestions for more wetlands activities and educational materials. Visit www.wetlandsalberta.ca

Alberta Conservation Association

This site provides great information on conservation projects across the province. You can also search for local or regional conservation sites to possibly visit with your students! Visit www.ab-conservation.com/go/default/index.cfm



Objective

Students will learn, through a variety of action projects, what they can do to help conserve, protect and enhance Alberta's wetland ecosystems.



Curriculum Connections

5-10-10, 5-10-11



Time

Variable



Materials

- Information listed to the left; how it is utilized is dependent on your time etc

Do More, Commit to One Simple Act

The *One Simple Act School Toolkit* provides grades one to six teachers with the tools and resources to have students personally commit to one of ten simple acts that protect the environment. This toolkit is flexible, offering a collection of tools that teachers can draw on based on students' needs. Visit www.onesimpleact.alberta.ca/get-involved/schools.asp

ONE SIMPLE ACT
IT'S EASY TO BE
 ENVIRONMENTALLY
FRIENDLY
onesimpleact.alberta.ca



Public Awareness and Education

One of the key ideas to conservation and protection of wetlands is education and awareness. In small groups, you can have your students develop a campaign to take into the community to promote the conservation, protection and enhancement of Alberta's wetlands. This can be accomplished, for example, through brochures, fact sheets, newsletters, posters, booths at trade shows or by attending community meetings regarding the natural environment.



Conservation in Action

Have your students make the following connections between the following activities and wetland protection. Then, ask them to commit to at least ONE action that they will practice year round.

- Short showers (5 minutes) or shallow baths – reducing water helps keep more water in the wetlands
- Turn off taps when brushing teeth – same as above
- Spread a light dusting of compost on your lawn – compost helps retain moisture, meaning less watering and more water in the wetlands
- Water lawns in the early morning or later evening – reducing evaporation, meaning more water in the wetlands
- Use recycled paper, and both sides – 99% of pulp is water (main ingredient for paper); reducing the use of paper helps conserve water
- Only turn on lights when necessary, and make sure they are turned off when you are not using them – using less electricity helps reduce the amount of water used in coal-fired electricity generating plants (water is heated to produce steam, which turns the turbine to help create electricity)
- Return unused or unwanted chemicals, hazardous wastes, paints, medicines etc to proper eco-stations or other collection sites – NOT pouring these materials down drains we help keep chemicals out of water systems
- Set up nest boxes in your local wetland – provide nesting sites for birds
- Volunteer to pick up litter, or clean up local wetlands – conserving, protecting, and enhancing our wetlands is a benefit to all wildlife and humans

Also ask students for their ideas on conservation actions to help protect and enhance wetlands!