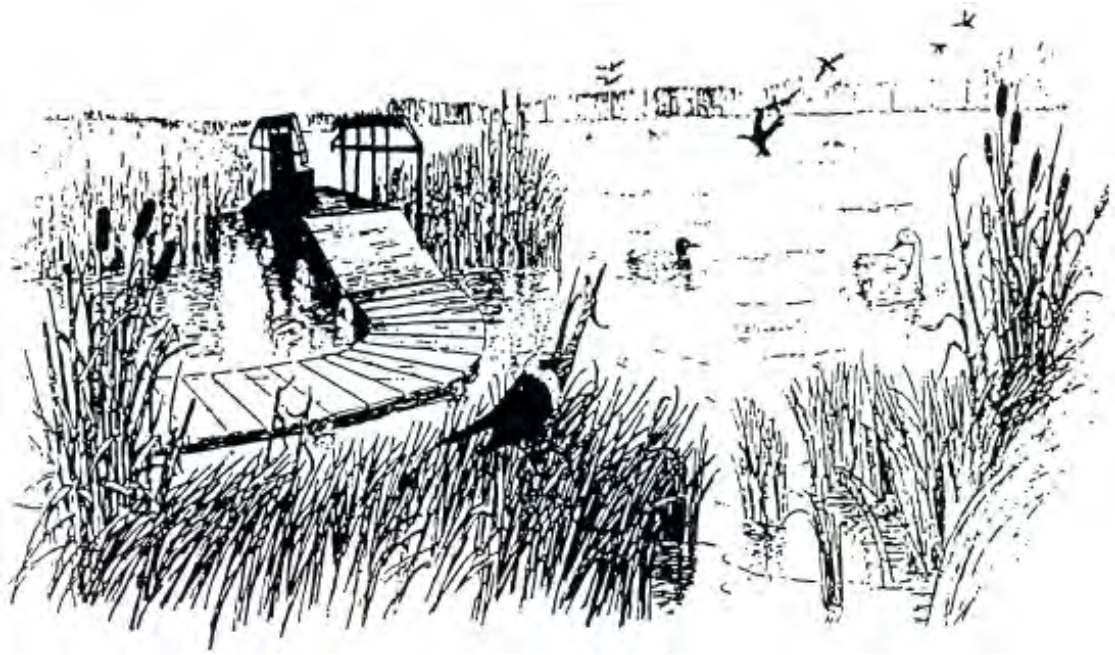
Fish Creek Provincial Park

WETLANDS

A Wetland Education Partnership science program
for Grade 5 students.



Fish Creek Environmental Learning Centre

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Fish Creek Provincial Park

Ducks Unlimited Canada
Conserving Canada's Wetlands

Government of Alberta

WETLANDS

A teacher conducted field study program for Grade 5 students.

This curriculum connected program was developed to support Grade 5 Science *Topic E: Wetland Ecosystems* and the vision of the *Plan For Parks*.

Developed by:

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1.0 INTRODUCTION

Welcome to **WETLANDS**, a curriculum connected full day field study with multidisciplinary preparatory and post activity support. The intent is to offer natural world experiences for students which reflect the curriculum expectations of *Topic E: Wetland Ecosystems* from the Grade 5 Alberta Elementary Science Curriculum, and the priority actions of Alberta's *Plan for Parks*:

- Involve Albertans
- Offer modern facilities, policies & programs
- Provide recreation opportunities
- Conserve landscapes

Fish Creek Provincial Park, Canada's largest urban provincial park, has a strong vision within its Visitor Services Program plan to support and foster environmental education. It states:

The Park offers a dynamic Visitor Services Program where participants are able to connect to our rich natural and cultural heritage through a variety of services and resources.

This is accomplished through modern facilities, competent staff, up to date resources, environmental education and public programs, research, partnerships and being an active member of the Calgary community and the Province of Alberta.

1.1 PROGRAM OUTLINE

Wetlands is a curriculum connected science program for Grade 5 students. Through observation and investigation, students will discover the wide variety of plant and animal life that depends upon each other to survive.

This program package includes preparatory and post field study activity suggestions in addition to the detailed on-site activity instructions. There are also checklists for helping arrange and organize your field study, and a set of field study sheets for students to use that facilitate the experience.

This program was developed by the Environmental Education staff at Fish Creek Provincial Park in consultation with formal and community educators.

1.2 PROGRAM OBJECTIVES AND CURRICULUM FIT

This field study program and the school based preparatory/post activities that complement it have been designed to meet the Alberta Elementary Science Program of Studies specific learner expectations from ***Topic E: Wetland Ecosystems***:

SLE 1
Recognize and describe one or more examples of wetland ecosystems found in the local area; e.g. pond, slough, marsh, bog, fen.

SLE 2
Understand that a wetland ecosystem involves interactions between living and nonliving things, both in and around the water.

SLE 3
Identify some plants and animals found at a wetland site, both in and around the water, and describe the life cycle of these plants and animals.

SLE 4
Identify and describe adaptations that make certain plants and animals suited for life in a wetland.

SLE 5
Understand and appreciate that all animals and plants, not just the large ones, have an important role in a wetland community.

SLE 6
Identify the roles of different organisms in the food web of a pond:

- producers: green plants that make their own food, using sunlight
- consumers: animals that eat living plants and/or animals
- decomposers: organisms, such as molds, fungi, insects and worms, that reuse and recycle materials that were formerly living.

SLE 7
Draw diagrams of food chains and food webs, and interpret such diagrams.

SLE 8
Recognize that some aquatic animals use oxygen from air and others from water, and identify examples and adaptations of each.

SLE 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.

SLE 10
Identify individual and group actions that can be taken to preserve and enhance wetland habitats.

SLE 11
Recognize that changes in part of an environment have effects on the whole environment.

Wetlands will provide students with opportunities to experience and address the Elementary Science general learner expectation:

5.10 Describe the living and non-living components of a wetland ecosystem and the interactions within and among them.

1.3 CROSS-CURRICULAR CONNECTIONS

Wetlands will provide students with opportunities to experience and address many curriculum connections with the Grade 5 core program of studies.

SOCIAL STUDIES

- the environment can effect the way people live (Topic A)
- information with regard to renewable and non-renewable resources (Topic A)
- conservation (Topic A)

LANGUAGE ARTS

EXPLORING

- formulating hypothesis
- posing questions to organize investigations

CONSTRUCTING

- focus their talk or writing on the important ideas related to a topic

COMMUNICATING

- provide support for the expression of opinions on topics within their immediate experience

MATH

- classifies objects according to visible characteristics
- uses appropriate standard measuring units for length

PHYSICAL EDUCATION

- experience success and enjoyment through participation in outdoor activities
- understand the use of clothing and footwear appropriate to outdoor activities
- understand safety principles as they apply to outdoor pursuits
- cooperatively work in groups.

2.0 ENVIRONMENTAL EDUCATION OPPORTUNITIES IN FISH CREEK PROVINCIAL PARK

Fish Creek Provincial Park stretches from the T'suu Tina First Nation at 37th Street in the west to the Bow River in the east. The Park is 20 km long, but only 1-1 ½ km wide, as it encompasses mainly the creek and surrounding valley.

The Fish Creek Environmental Learning Centre, located at the west end of the Park off 37th Street S.W., offers five indoor classrooms, an outdoor picnic area and access to an extensive variety of natural ecosystems: old spruce forest, grasslands, creek waterways, wetlands and disturbed (urban) areas.

2.1 FISH CREEK ENVIRONMENTAL LEARNING CENTRE

The Fish Creek Environmental Learning Centre offers you the following facilities and services:

1. Each teacher will be given a classroom to use as a home base for the day's activities.

2. Some equipment for the day's activities will be available at the Park. It is your responsibility to count all equipment and return it at the end of the day. Lost or broken equipment must be paid for or replaced.

3. Washrooms and a water fountains are located in the building. There are no vending machines or coffee available. Hot water urns are available upon request. Please make hot drinks in cups, not the urn.

4. A short orientation (about 15 minutes) will be provided to the entire group upon arrival to welcome and introduce everyone to the Park, its rules, the program for the day and what the students may discover outside.

5. Parent volunteers will have a separate orientation (about 10 minutes) to the equipment provided, map of the activity area (maps provided) and the general flow of the day.

6. A washroom and snack break will take place after the group orientation and during the parent volunteer orientation. Please ensure that the students are supervised during this time.

7. **There are NO indoor activities available.** Please bring your own activities and/or DVDs when planning for inclement weather.

2.2 LUNCH BREAK PROCEDURES

Your class may eat inside the facility, within their assigned rooms. Please ensure they understand the following prcedures:

- Empty pop or juice can/bottles and drink boxes go into the special container labeled "BOTTLES AND CANS". We send these to recycling depots. Do the students know what recycling is, how is conserves resources and how it helps the environment?

- Paper and plastic lunch bags, plastic sandwich bags, food wrap and tin foil go home to be reused. What must be done to it before it is stored? Why does it need to be washed? Why is it important to reuse items?

- All other items go into the garbage bin and sent to the landfill. What happens to these items at the landfill?

2.3 OUTDOOR LUNCH OPPORTUNITIES

There are several picnic tables and a large firepit behind the Fish Creek Environmental Learning Centre. Reservations are required to use this outdoor cooking firepit. Call 297-7229 to reserve.

When using a firepit area be sure to:

- provide your own roasting sticks and firewood. DO NOT USE BRANCHES OR DEADFALL IN THE PARK.

- have a bucket of water nearby BEFORE the fire is lit.

- Do NOT feed or disturb wildlife.

- remind students to clean up the firepit area of garbage and left over food.

- check the fire is out before you leave the area.

3.0 TEACHER INSTRUCTIONS AND CHECKLIST FOR PLANNING YOUR FIELD STUDY DAY

Give every driver – I**NCLUDING THE BUS DRIVER** - a copy of the route map
Make sure all drivers know you are coming to **the west end of the Park, near Woodbine!**

PREPARE YOURSELF

- Read the teacher package thoroughly: phone 403-297-7229 if you have any questions
  - Provide and/or modify the optional journaling/data sheets you would like to include in your field study for your needs
- Split your class(es) with parent volunteers into 2 groups, for morning and afternoon activities (see page 11, Itinerary)
- Check student health forms, looking for allergies to bee/wasp stings, nuts, etc.

PREPARE THE STUDENTS

- Review the Park rules (explained on page 12)
- Discuss the field trip, using the points listed on page 13: emphasize the following
  - Bring a hat and refillable water bottle
  - Wear sneakers, not sandals; bring rubber boots for use at the pond.
  - Dress in layers
  - Bring food and water, not money; there are no stores nearby or vending machines at the Learning Centre or Glennfield.
- Complete some preparatory activites: either the ones in this package or some of your own.

PREPARE THE ADULTS

- Please follow the recommended ratios as outlined in your school board regulations. Divide your class into 2 groups, then within these groups into smaller working groups led by a parent volunteer.
- Review the park rules with the adults (explained on page 12)
- Emphasize the following:
  - It is always a good idea to bring a hat and refillable water bottle
  - Wear comfortable walking shoes, not sandals; bring rubber boots for the pond.
  - Dress in layers; the temperature and weather can change unexpectedly
  - There is nowhere to buy anything at the Learning Centre or Glennfield, including COFFEE!
- The adult's role is to assist with and support the supervision of students throughout the entire day

YOU BRING:

- A cheque made payable to **Minister of Finance** for $5.00 per student (no charge for adults)
- First Aid kit
- Student journals, pencils, etc. (as you deem fit)
- Before you leave the school on the morning of your field study, collect the names and cell phone numbers of all of your teacher and parent volunteers.

3.1 PLANNING YOUR ITINERARY FOR THE FIELD STUDY DAY

Below is a sample itinerary for your field study day. This is a tool for your parent volunteers so they know the key times during the day. Key times are:

- when to arrive at the school,
- when to meet at the park,
- when to be back for lunch and
- when to be back at the Learning Centre to ensure a smooth departure.

Your departure and arrival times are set by you and the bus company at the time of booking the bus.

The Wetland Educator leads the pond study and will provide a park orientation to the group. You will be leading the hike while the other group is at the pond.

Time	*Activity*
_____	Depart from school
_____	Arrive at Fish Creek Provincial Park , orientation, snack and bathroom break
_____	Group A: Pond Study(about 1.5 hours)
	Group B: Land Study (about 1.5 hours)
_____	Lunch (held either inside or outdoors, weather permitting and at your discretion) and bathroom break (30 minutes)
_____	Group A: Land Study (1.5 hrs)
	Group B: Pond Study (1.5 hrs)
_____	Return to classroom, gather groups and belongings (15 minutes prior to departure)
_____	Load bus, travel back to school
_____	Arrive back at school

4.0 CLASS DISCUSSION ABOUT THE FIELD STUDY

Alberta's Parks and Protected Areas

Alberta's parks and protected areas belong to all Albertans and contain many different natural landscapes that are home to numerous plant and animal species. The province's network of parks and protected areas covers roughly 27,500 square kilometres and includes more than 500 sites. This network helps to ensure that Alberta's biodiversity is preserved for future generations.

Alberta's *Plan For Parks* vision: *Alberta's parks inspire people to discover, value, protect and enjoy the natural world and the benefits it provides for current and future generations.*

Provincial parks exist to protect provincially significant natural, historical and cultural features. They contain a range of outdoor recreation, interpretive and environmental education opportunities, facilities and services so that visitors can explore, learn, understand and appreciate the natural world.

Alberta's Parks are protected by the Alberta Parks Act, and it is through this legislation that these landscapes have specific and important guidelines to help keep them healthy and vibrant.

The following is a list of rules that reflect the Park's mandate to protect and conserve the natural environment.

Do not feed or disturb wildlife
Feeding wildlife is not necessary and is potentially dangerous. The Park's ecosystem provides all the food and habitat wildlife require for their basic needs. Human food does not meet their nutritional requirements and can cause some species to become dependent on handouts. Quietly observe all wildlife from a comfortable distance.

Leave only footprints
Take only pictures. Everything in the Park - breathing and non-breathing - is protected to help conserve the complex living system that thrives in Fish Creek Provincial Park. Students are welcome to share their discoveries, but must remember to leave everything as they found it. Treat plants, insects and trees gently to avoid unnecessary injury or damage.

Pets on a leash
There are no off-leash areas in any of Alberta's provincial parks. This protects Park wildlife as well as domestic pets. Please do not bring pets on the field study. They can be distractions for students and pose a health risk for those allergic to pets. Guide Dogs and Assisted-Living Dogs are the only animals permitted in Park buildings.

Pitch in
Litter should be placed in the rubbish bins provided or in a pocket. Human litter is hazardous to Park plants and wildlife.

Fire in its place
Use only designated fire pits. The burning of Park vegetation is not permitted.

Discussion Checklist

___ Discuss how Fish Creek Provincial Park is a wild environment. It is one of 500 parks that are protected as a provincial system of natural environments. Discuss the difference between wild and tame animals and environments (coyotes vs. pet dogs, Fish Creek Provincial Park vs. school yard, etc.)

___ Discuss the purpose of provincial parks and protected areas. Have the class make a list of behaviours on the field study that would show respect for living things and a commitment to their care. Possibilities include:

- leave ant hills, nests and rotting logs alone and intact. They are animal homes.
- walk with care and mindfullness. When leaving the trails to complete program activities take care to minimize your impact.

___ Discuss the Park rules. These rules reflect the provincial parks mandate to protect and preserve our natural environment (page 12).

___ Discuss outdoor safety. Students need to:

- stay where an adult can see them at all times
- walk, do not run.
- keep feet on the ground: no climbing.
- leaves dead branches on the ground: they do not make safe walking sticks.

___ Discuss behavioural expectations. Explain that the field study will be another school day, just at a different place. All the school rules apply. Remember that other schools will probably be there trying to also work.

___ Discuss the appropriate clothing required for the season and the day's activities. Dress in layers.

Mornings in the shady forest will be cool. Trails may be muddy and wet. Several layers of clothing, including a water resistant layer and a hat or hood will provide the most comfort. Warm weather means sunhats, sunscreen and insect repellent will also be required.

5.0 INTRODUCTION TO WETLAND ECOSYSTEMS

In studying wetland ecosystems we look at the living and non-living things in an area and their interactions. This means we try to account for as many parts of the ecosystem as possible, e.g. the plants, animals, soils, and the flow of energy and nutrients through it. A wetland ecosystem does not end at the water's edge, and as water levels change so do the interactions occurring within the ecosystem. Many wetland animals, such as dragonflies, will use both land and water areas throughout their life cycle. In our wetland study we will be looking at three wetland zones: the aquatic (water), riparian (water's edge) and upland (higher land).

Figure 1:
When studying ecosystems we look at the interactions of plants, animals, soils, even the flow of energy and nutrients.

Organisms within an ecosystem have adaptations, or specialized bodies and behaviors which help them to survive. For example, insects have adapted different ways of breathing (or obtaining oxygen) in a watery environment, either from the water's surface or through the water itself (see fig. 2).

Predacious diving beetle *Damselfly nymph*

Figure 2:
Two breathing adaptations: adult predacious diving beetles swim to the water's surface, capture bubbles of air beneath their wings and breathe through specialized skin, whereas damselfly nymphs stay on the pond bottom and use gills to pull oxygen directly from the water.

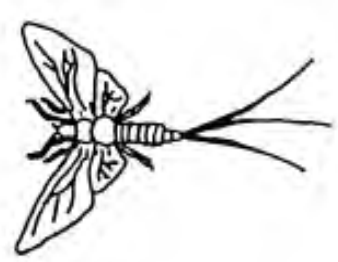
Human actions can effect wetlands in positive and negative ways. These can occur indirectly, through reducing the amount of garbage we create, or directly, by responsible wetland use (e.g. not trampling shoreline plants). In Fish Creek Provincial Park, engineered wetlands have been constructed to help filter water runoff from surrounding communities before the polluted water reaches Fish Creek.

6.0 PREPARATORY FIELD STUDY ACTIVITIES

The preparatory activities described here will introduce the field study day to your students and will allow them to practise the skills to be used during the field study day. If possible invite the parent volunteers into the classroom to also experience these activities.

Feel free to use your own activities in addition to the ones described in this orientation package. Within the activities you select and present to your students be sure to:

- Select activities in addition to the ones described in this package that reflect each specific learner outcome from the curriculum that will be addressed on the field study day. ***(See Program Objectives and Curriculum Fit).***
- Consider other curriculum areas and explore how all subject areas can be connected to your field study day.
- Conduct some activities outside to get the students familiar with outdoor classroom management strategies and thinking of school in an outdoor setting.



6.1 PREPARATORY AND POST TEST

This preparatory and post test is designed to evaluate learning associated with this field study experience, not the entire unit. It should be the first and last activity the students do. By comparing the changes in their scores it's possible to gain some insight to what the students have learned from this field study experience.

WETLAND ECOSYSTEMS

_____ _____

Name **Date**

1) How would you describe a wetland to someone who has never seen one before?

_____

_____

2) List THREE ways that wetlands help the environment.

a) _____

b) _____

c) _____

3) Describe ONE way that YOUR CLASS could help teach people about wetlands in the Calgary area.

_____

_____

4) List THREE living things and THREE non-living things that you can find in wetlands.

Living Things	Non-Living Things
a) _____	_____
b) _____	_____
c) _____	_____

5) Read the following questions, circle the number that best describes what you think and answer the questions below…

		not really				absolutely
a)	I think wetlands are really important for humans and animals.	1	2	3	4	5
	Why/how? _____					
b)	I would like to help protect wetlands.	1	2	3	4	5
	How? _____					
c)	I would really like to visit a wetland, in my neighbourhood or somewhere else.	1	2	3	4	5
	Where? _____					

6) Imagine you are trying to describe a wetland to someone who has never seen on before. Draw and label a picture of a wetland, including as many parts as you can think of including plants and animals and non-living things.

WETLAND ECOSYSTEMS

_____ _____

Name **Date**

1) How would you describe a wetland to someone who has never seen one before?

A wetland is an area with soils that hold water, where water levels can change a lot throughout the year, and can have many kinds of water loving plants and animals.

2) List THREE ways that wetlands help the environment.

a) **They filter pollutants out of water runoff**

b) **They provide habitat for many species of plants and animals**

c) **They hold water - this can help to prevent floods or drought**

3) Describe ONE way that YOUR CLASS could help teach people about wetlands in the Calgary area.

Answers will vary - they may include making posters, sharing research projects, informing the media (radio, newspapers, television), creating newsletters or a website, raising money for conservation organizations…

4) List THREE living things and THREE non-living things that you can find in wetlands.

Living Things	Non-Living Things
a) **Plants**	**Soils**
b) **Animals**	**Water**
c) **Fungi**	**Rocks and minerals**

5) Read the following questions, circle the number that best describes what you think and answer the questions below…

	not really				absolutely
a) I think wetlands are really important for humans and animals.	1	2	3	4	5

Why/how? **They hold and clean the water, they are excellent habitat**

b) I would like to help protect wetlands.	1	2	3	4	5

How? **Talking with people about responsible wetland use, joining community projects**

c) I would really like to visit a wetland, in my neighbourhood or somewhere else.	1	2	3	4	5

Where? **In a city or community park, a constructed wetland, a pond near cabin, etc.**

6) Imagine you are trying to describe a wetland to someone who has never seen on before. Draw and label a picture of a wetland, including as many parts as you can think of including plants and animals and non-living things.

6.2 VOCABULARY

Introduce the following terms to your students. These terms can be introduced through games such as ECO CROWS AND CRANES (see page 22) or integrated into the spelling program used in language arts. The crossword puzzle included in the appendices of this package can be used as an assessment tool to ensure students understand terminology important to this unit of study.

adaptation: physical structure or behaviour which helps an organism survive in the ecosystem it lives in.

carnivore: organism that eats animals.

community: all the organisms living together in a certain area. Can include any number of different populations. e.g. spruce trees, woodpeckers, red squirrels

consumer: organisms that obtain their energy by eating other organisms.

ecology: the scientific study of the relationships between organisms (including humans) and their environment.

ecosystem: a community of organisms interacting with its environment, including non-living elements such as soil and water.

environment: the total of all surrounding influences which affect the life and development of organisms, including air, water, soil and weather.

food chain: a set of producer and consumer relationships within a group of living things, starting with the sun and moving from the producer to the decomposer.

food web: the relationships among all the food chains in a community: an interlocking pattern of food chains.

habitat: where an organism lives.

herbivore: an organism that eats plants or their products.

interaction: relationship or action occurring between two or more organisms.

omnivore: organisms that eat both plants and animals.

organism: any plant or animal; a living being with organized structure.

population: organisms of the same species living and reproducing in the same place.

predator: an animal that hunts and eats other animals for food.

prey: an animal that is hunted and eaten by other animals.

producer: an organism that makes its own food using sunlight, water, carbon dioxide and inorganic substances.

6.3 WETLAND CLASSIFICATIONS

A wetland is an area characterized by water-holding soils, changing water levels, and water-adapted plants and animals. The Canadian Wetland Classification System identifies 5 general classes of wetlands: **bog, fen, marsh, swamp** and **shallow open water**. Common terms like *"slough"* and *"pond"* and are often used to refer to wetlands and deciding for sure what the wetland is can be tricky.

As a very general rule, in Alberta you will find bogs and fens in more northern regions, and marshes, swamps and shallow open water in more southern regions. In Fish Creek Provincial Park, the wetland used for your field study is a shallow open water wetland. It is a pond originally formed by beaver, and today water enters the pond through precipitation, ground water, and flooding of Fish Creek.

Lakes, rivers, creeks and other permanent, moving water bodies are classified by different systems, and therefore are distinct from wetland classifications.

Table 1: Alberta's wetlands (adapted from *Wetlands: Webbed Feet Not Required* Teacher's Guide, 2005)

	Bog	Fen	Marsh	Swamp	Shallow open water
Common name	muskeg, peatland	muskeg, peatland	sloughs, ponds	sloughs	sloughs, ponds
Location	cold, wet lowlands in Northern Alberta	cold, wet lowlands in Northern Alberta	lowlands throughout Alberta	forest	lowland areas throughout Southern Alberta
Water source	mostly precipitation	groundwater, precipitation	groundwater, surface water, (rivers, etc.), precipitation	seasonally-flooded rivers, creeks, etc.	surface water
Common plants	sphagnum and peat mosses	sphagnum and peat mosses	cattail, rushes	trees and shrubs	grasses, sedges

6.4 ECO CROWS AND CRANES

This game offers a good organizational format that can be used repeatedly with a wide variety of topics. Once they understand how the game is played the format can be used to teach and informally evaluate many topics.

Ask the students to find a partner and stand facing each other along a line you have designated. Designate one side as the "true" side and the other as the "false" side. Explain that you will make a statement. If the answer to the statement is true, then the "true" side chases the "false side for 5 metres. If they tag someone that person comes over to their side. If the answer to your statement is false, then the opposite happens, the "false" side chases the "true" side for five metres.

Prepare 10 statements that mix up the true and false answers and play the game. This game offers a good informal assessment tool. If both groups run in opposite directions, or run into each other or don't move at all, you know there is a problem with the concept in the statement you just made.

SAMPLE STATEMENTS:

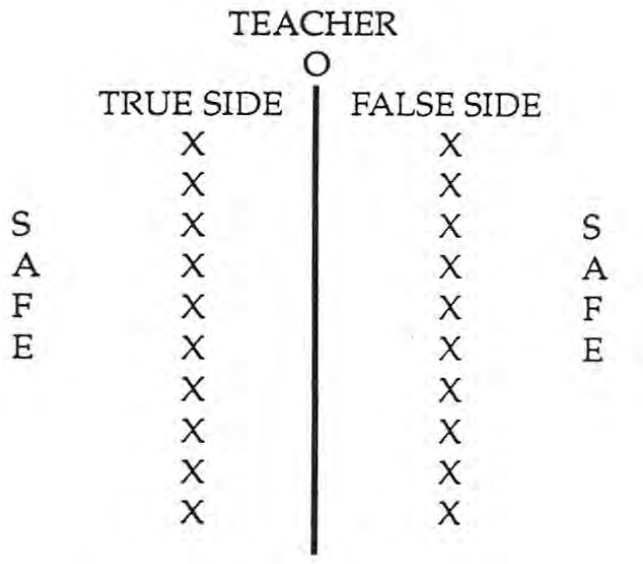
True An organism that eats only plants or their products to gain its energy is called a **herbivore**.

True The relationships among all the food chains in a community is called a **food web**.

False A physical structure or behaviour which helps an organism survive in the ecosystem is called **ecology**.

True An animal that is hunted and eaten by other animals is called a **prey**.

False Wetland ecosystems are **not** influenced at all by the terrestrial ecosystems that surround them.



6.5 STUDENT LEARNING JOURNALS

Preparation for the Field Study day.

Provided in this teachers' package are resources and ideas for student learning journals, however **it is up to you to decide how you would like your class to record their field experience.** Personalized worksheets, nature sketchbooks, observation lists, even photography can be used; the important thing is to decide how your students will be using their time during their field trip, and what they can work on in the classroom.

If you choose to use worksheets during your field study, please take some class time to review these sheets with your students so they can more effectively use them during their field experience. Keep in mind the pond is a muddy place, and worksheets are going to get dirty.

6.6 MYSTERY SPECIES

This is a good student centred activity for introducing the plants and animals that live in a wetland.

Provide the students with a list of possible plants and animals found in a wetland ecosystem and ask each student to select one. Be sure nobody knows anyone else's species.

Ask each student to prepare four clues about the wetland species that progress from general information, with the first clue, to more specific information with each subsequent clue.

EXAMPLE: water strider

CLUE NUMBER 1:
I am small consumer, found on still water in areas that are not to windy.

CLUE NUMBER 2:
I have 3 body parts and six wax-coated feet that keep out the water.

CLUE NUMBER 3:
I stand with legs spread apart to distribute my weight so I won't break through the water's surface as I move around the wetland.

CLUE NUMBER 4:
I can move very fast and change direction quickly as I glide across the water.

Ask one student to come up and read their first clue and place it onto a poster board. The rest of the class guesses what they think it is and places their written guesses into a box. The student presenting the clues goes through the guesses to see if anyone was correct. If not, then they present the next clue. This progresses until someone guesses what the mystery species is.

Give each student the opportunity to do this in the weeks that lead up the field study.

7.0 ON-SITE FIELD STUDY ACTIVITY DESCRIPTIONS

7.1 POND STUDY

Objective: Students will understand that a wetland ecosystem involves interactions between breathing and non-breathing things, both in and around the water. Students will identify some plants and animals, examining some of the special adaptations they have to survive in a wetland.

Activity Summary: The class will move to the pond study area with the Wetland Educator, where they will collect, examine, record and return the invertebrates to the water. Particular attention will be paid to adaptations and interactions.

Time: approximately 1.5 hours

Equipment provided by the Centre:

white basins
Aquatic Invertebrate and Plant Identification Guides
two-way microscopes
microboxes
scoop nets

Equipment provided by the school:

Student learning journals, pencils (if desired)

Setting: pond

Instructions:

The Wetland Educator will provide an orientation to equipment and activities at the pond site, and will be on hand to provide assistance throughout the pond study.

1. Equipment will be distributed to the working groups by the Wetland Educator.

2. The Wetland Educator will review the collection procedures:

   a. The white basin will be filled half way with clear, cool, fresh pond water. This is where you will place all of the plants and animals you collect that day, so limit the amount of "muck" to keep the water suitable for observation of life.

   b. Every student will have a scoop net. Use the scoop nets to collect animals from the water, then bring them back to the white basins.

   c. Bend down close to the tub and get your scoops under the water before releasing the animals into the white basins - let them swim out of your scoops.

   d. Make sure to collect a few plants, so that the animals will have something to hide in and cling to while in the white basins.

e. Observe the plants and animals; some will be as large as your hand, others as small as a pencil tip

i watch the whole white basin for different swimming techniques, ways of breathing, and animals eating each other

ii use a microbox or a two-way microscope to look closely at particular plants or animals

3. Observe life around the pond's edge, as a healthy pond requires a healthy shoreline.

4. Record your observations in a student learning journal (if desired).

Safety:

1. you are working with living organisms:

   a. keep organisms in water at all times

   b. handle all organisms with care

   c. all water and organisms are returned to the pond

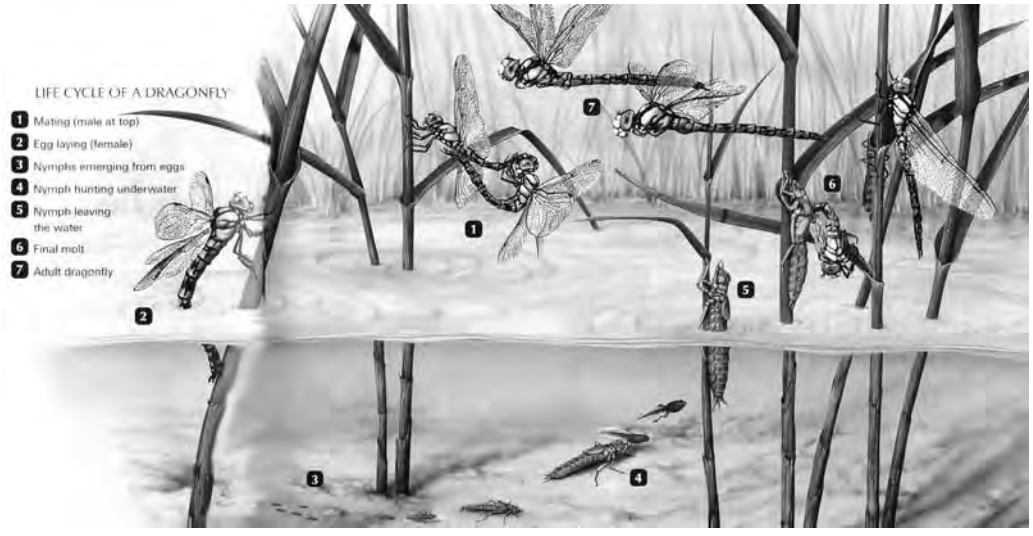
   d. do not pour water - immerse and tip your containers

2. stay out of the water

3. no horseplay

4. careful where you step

5. follow instructions



7.2 LAND STUDY - WETLAND WONDERINGS

Objective: Students will understand that a wetland ecosystem is part of a greater ecosystem that includes interactions between breathing and non-breathing things. Students will explore the Riparian (riverside) area, observing some plants and animals, while examining interactions and adaptations.

Activity Summary: Students will explore the upland and riparian areas of the wetland ecosystem on this walk. They will observe and record the many components of an ecosystem, watching for animals, plants and insects and exploring how they interact with each other in this ecosystem. They will also consider how human impact affects the Park.

Time: 1.5 hours

Equipment provided by the centre:

Wetlands Wonderings booklet

Equipment provided by the school:

Student learning journals
Pencils
Activity sheets (your choice)

Setting:

Riparian and Upland forest ecosystem

Instructions:

1. Divide class into 5 smaller groups with a minimum of one adult volunteer per group of 6 students
2. Give each adult volunteer an *Wetlands Wonderings* booklet
3. Ensure students each have a pencil/pen and Learning Journal or paper on which to record observations
4. Ensure adult volunteer knows when to be back at "Home Base"
5. Set forth and discover!
6. Please stay in the assigned areas of the Park so Park staff know where you are.

8.0 POST FIELD ACTIVITIES

The intent of conducting post field study activities is to provide an opportunity for students to review what they learned on the field study within the context of where they live. These activities serve to review the main concepts of the field study and reinforce basic skills.

8.1 STUDENT LEARNING JOURNAL

Provide some class time to ensure that Student Journals are complete. During class discussions about the following items (8.1.1, 8.1.2 and 8.1.3) provide students with the time to comment on these discussions in their Journal. Develop title page covers for each Journal and place them in a classroom library so all students have access to all Journals. This sharing of data is an important element in the scientific process and provides an opportunity for students to expand their learning.

8.1.1 Human Impact

Discuss the impact or changes humans have made in the park. What effect have these had on the wetland environment they visited on the field study? Summarize this in their Learning Journals with written work and illustrations.

8.1.2 My Impact

First individually, ask the students to create two lists. One the first list indicate things they do to damage the environment (i.e. litter). On the other list, indicate things they do to help the environment (i.e. keep dog on leash, stoop and scoop, pick up litter). Share these lists through a class discussion. As a class come up with other ways they can help the environment. Encourage them to act on their ideas. Summarize this in their Student Learning Journal with written work and illustrations.

8.2 POND EXPLORATION

Ensure all worksheets are completed as fully and accurately as possible. Have the students select one plant and one animal to research. Reports should include adaptations, interactions and the life cycle of the organism. After the research has been presented, can the students complete the web picture on their worksheet in more detail? Graph the results in the numbers column on the critter chart and/or use this information to create a pyramid for the populations in the pond.

8.3 UNDERWATER ART WORK

This activity uses water, re-sealable plastic bags, picture frames or mat-board and student art to create an interesting artistic effect.

Ask the students to create some artwork that reflects an aspect of the field study using whatever medium they wish (crayon, paint, pastel, collage, etc). These should be the same size as the plastic re-sealable bags they are using. Fill this re-sealable plastic bag with water to that when all the air is removed and it is sealed, it is about 2 cm - 3 cm thick. Place the student artwork behind this re-sealable plastic back and cover both with a mat-board frame and hang on the wall. Movement in the water will create an interesting effect for the picture behind it.

8.4 COMMUNITY STORM DRAIN EDUCATION PROGRAM

This activity introduces students to how things they can't see influence water quality and provides an opportunity for them to do some community education.

One of the significant threats to water quality is ground water contamination. Pollutants such as fertilizers, oil and litter make their way into Fish Creek, and other bodies of water in your area, through ground water and storm drain deposits.

Contact the City of Calgary, Water Works to determine how the storm drain system in your area works. Chart out a map of were the storm drains go from your community. Which bodies of water to they impact?

Create a brochure to educate the community about this drain system and what should, and should not, be put down there. These could be sent home with the school newsletter or used in class presentations students make in other classrooms in the school.

Create some stencils with education messages that, with the City Water Works permission, could be spray painted on the ground near storm drain entrances. Contact Trout Unlimited Canada at www.yellowfishroad.org for information and resources to conduct this activity.

8.5 FOOD WEB MOBILES

This activity summarizes the plants and animals found at the wetland and provides an opportunity to play some fun and challenging games with props and materials developed by students.

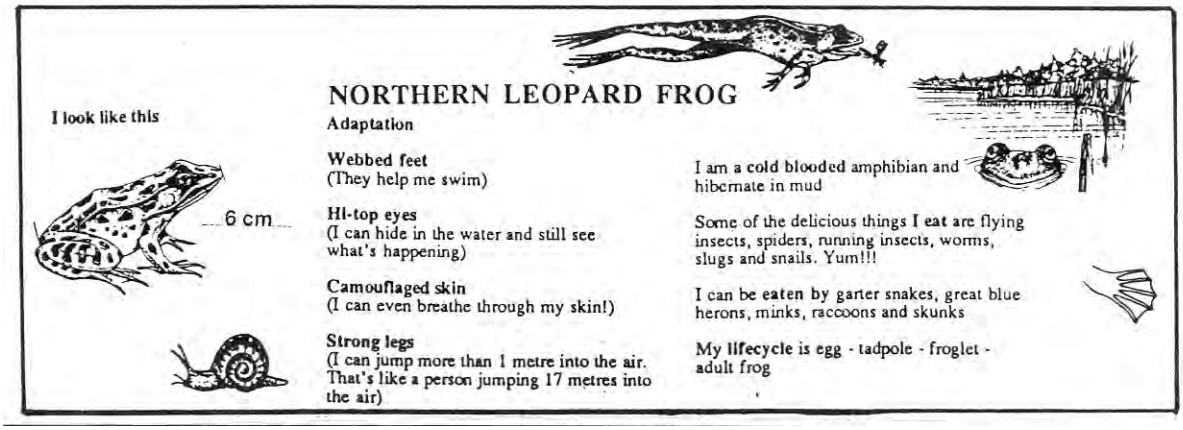
Review all the plants and animals found at the wetland. Have the students create cards with the following information:

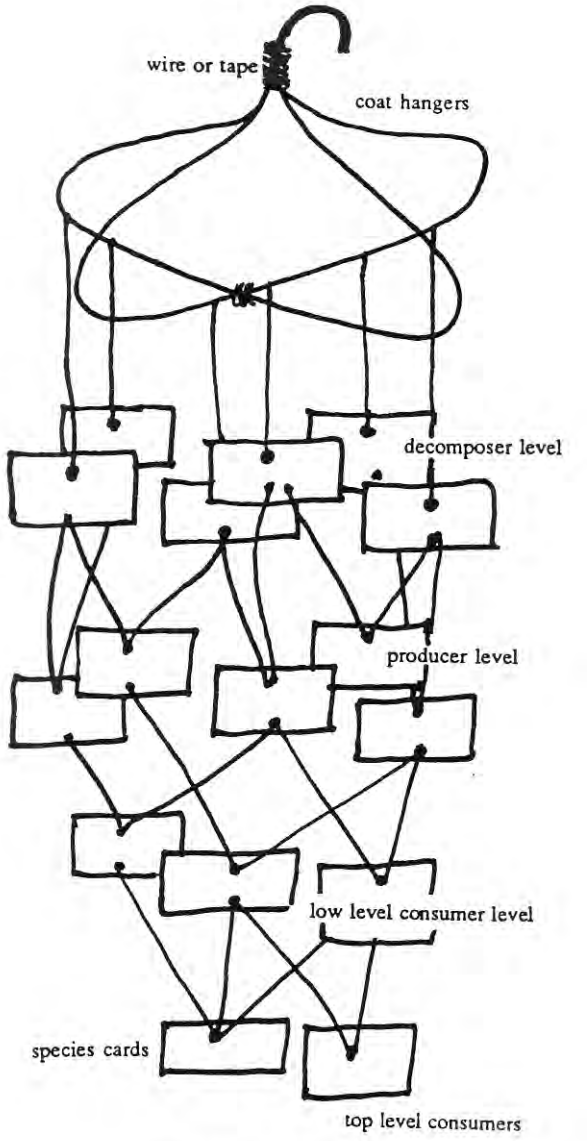
- species name
- diagram or cut out pictures that includes some reference to size
- unique adaptations
- survival requirements (what specific needs does it require to survive)
- role in the food chain or ecosystem

Once students have created complete sets of these cards for the wetland ecosystem challenge them with a few questions such as the following.

1. Group all the producers, consumers and decomposers together
2. Create food chains with 3 elements, with 4 elements and with 5 elements
3. Create an ecosystem pyramid with the cards
4. Arrange your cards to show how the wetland ecosystem would change if all the plants were removed.
5. Arrange your cards to show how the wetland ecosystem would change if the water content was doubled.

Finish this activity by creating mobiles out of the cards students have made. These mobiles should represent the food pyramid that exists in the wetland ecosystem from top level consumers on down through low level consumers, to producers to decomposers.





strings that indicate food web connections

Punch holes in the middle of the top and bottom on each card. Cut doweling or coat hangers into different size pieces, add string and the cards students created so that animals and plants are connected as they would be in real life. Balance the pyramid by adjusting string length or moving cards around. After it is balanced, discuss what happens when one animal or plant is taken away, i.e. becomes extinct or leaves one area for another.

8.6 NEWS ARTICLES

Ask the students to read the newspaper, magazines and other periodicals and watch for articles about water issues. Collect these news articles and have the students critically review them.

What are the issues?

Who are the players in the issue?

Are all sides of the issue represented in the article?

Is there enough information to properly inform the public about the issue?

Does the issues apply locally?

What is your opinion on the issue?

Is there anything you can do to solve the concerns expressed in the article?

8.7 ENVIRONMENTAL SCENARIOS DEBATE

Using the scenarios provided have class debates. Making the students take a stand on the issues will help them to realize how complicated the issues can be. Introduce the scenario. Through a class discussion, describe the following:

What is the issue?

Who are the players?

SCENARIO #1

Farmer Jones has a very large marsh on his property. He wants to drain it so he has more land that can grow crops. He says this is necessary because low grain prices have reduced his income. He must pay his bills or the bank will foreclose on his farm. Many of Farmer Jones neighbours oppose his plan. Jones' marsh is the only wetland area for kilometres around. It is an important habitat, especially for waterfowl. Many species nest at the march. Migrating birds use it for a feeding and resting stop. His neighbours also point out the birds help the farmers by eating many insects.

SCENARIO #2

A paper company wants to build a new pulp and paper mill in a small community. Some residents support the proposal because the mill will provide work for 400 people. Many of the young people will not have to leave the area looking for jobs. The increased money being spent in the area will help the economy of the entire town. Opponents of the proposal point out that favourite recreation areas will be destroyed, polluting chemicals will enter the town's river and that noise pollution will increase significantly.

8.8 QUOTES FROM NOTABLE NATURALISTS

This activity provides an opportunity to integrate Language Arts into this field study, students can be presented with the quote below or any other quotes from other notable naturalists.

> ***"This we know, the earth does not belong to Man;***
>
> ***Man belongs to the earth.***
>
> ***All things are connected, like the blood which unites one family.***
>
> ***Whatever befalls the earth, befall the sons of the earth.***
>
> ***Man did not weave the web of life.***
>
> ***He is merely a strand of it.***
>
> ***Whatever he does to the earth, he does to himself."***
>
> **Chief Seattle**

Read the quote to the students. Give them several minutes to think about it and then discuss it as a class.

Ask the students to write and illustrate an explanation of its meaning to them personally.

Have the students rewrite it using their own words to demonstrate they understand the meaning of the quote.

Ask the students to develop and illustrate their own philosophical quotes on an environmental issue or topic.

8.9 RECOMMENDED RESOURCES

Webbed Feet Not Required
Alberta Environment - available for download as a PDF or for order at Alberta Environment's Environmental Education website, pdf link here: http://environment.gov.ab.ca/info/library/8207.pdf

Ducks Unlimited

Lesson plans and environmental science resources. www.ducks.ca

***Yellow Fish Road* program**

Trout Unlimited Canada - stormdrain stencilling kits and in-class presentations www.yellowfishroad.org

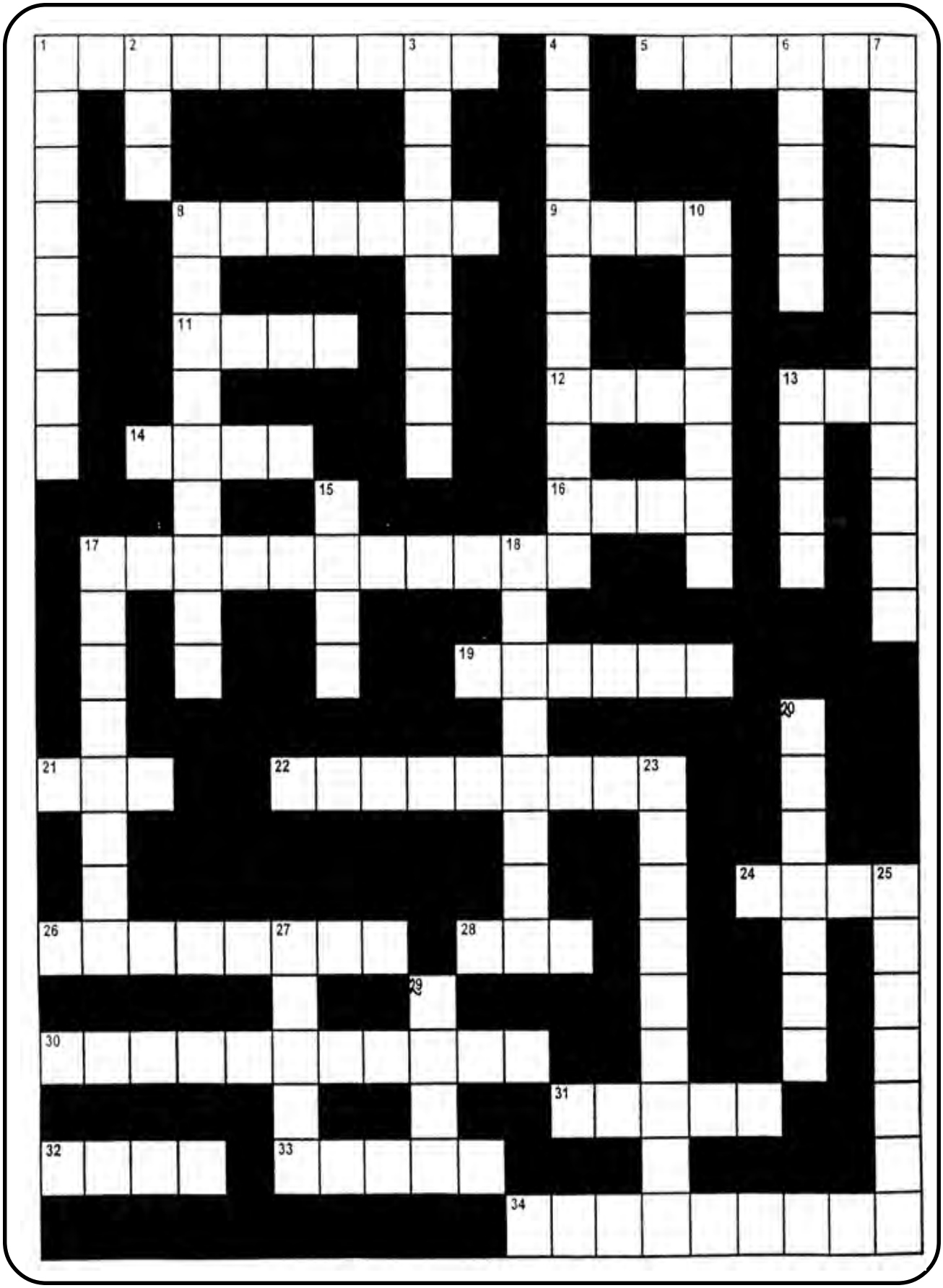
One Simple Act

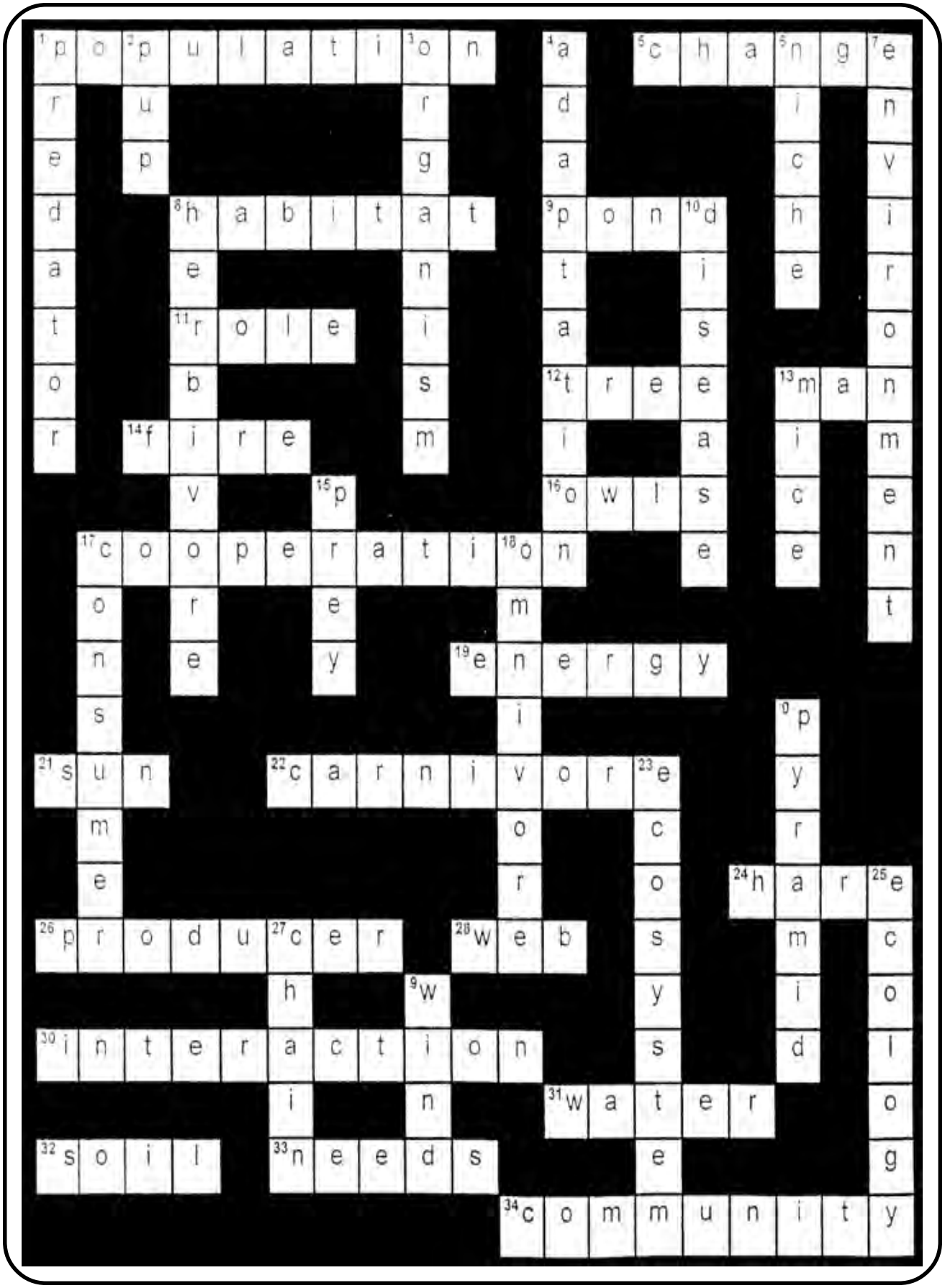
Alberta Environment - simple ways that students can affect positive change for the environment. www.onesimpleact.alberta.ca

Kananaskis Envrionmental Education Resources

Several downloadable programs are available that tie into the Grade 5 *Wetlands* unit. Of specific interest is the *Aquatic Animal Identification Guide* (at the end of the list). www.tpr.alberta.ca/parks/kananaskis/ed_materials.asp

9.0 NOTES




1 p o 2 p u l a t i 3 o n 4 a 5 c h a 6 n g 7 e
r u r d i n
e p g a c v
d 8 h a b i t a t 9 p o n 10 d h i
a e n t i e r
t 11 r o l e i a s o
o b s 12 t r e e 13 m a n
r 14 f i r e m i a i m
v 15 p 16 o w l s c e
17 c o o p e r a t i 18 o n e e n
o r e m t
n e y 19 e n e r g y
s i 0 p
21 s u n 22 c a r n i v o r 23 e y
m o c r
e r o 24 h a r 25 e
26 p r o d u 27 c e r 28 w e b s m c
h 9 w y i o
30 i n t e r a c t i o n s d l
i n 31 w a t e r o
32 s o i l 33 n e e d s e g
34 c o m m u n i t y

ACROSS

1. organisms of the same species living together in the same place
5. to alter or make different
8. where an organism lives
9. a small, usually circular body of water
11. the function an organism fills in its ecosystem
12. balsam poplar is a deciduous , ...
13. opposite of woman
14. to roast marshmallows you need a _____
16. birds that hunt at night
17. working together for joint benefit
19. strength or power
21. all our planets revolve around the _____
22. any meat eating animal
24. a snowshoe _____ turns white in winter
26. organism that makes its own food
28. a spider may spin a _____
30. relationship of one organism to another
31. liquid ice
32. another word for dirt
33. animals have basic _____, such as water and food
34. all the organisms living together in a certain area

DOWN

1. animal that hunts other animal
2. baby coyote
3. each plant and animal is an . . . .
4. a change to help an organism survive is an . . . .
6. the place an organism holds in its ecosystem
7. all the surroundings that affect an organism
8. any animal that only eats plants
10. illness or sickness
13. small rodents some people have for pets
15. animals that are hunted by other animals
17. any animal that obtains food by eating other organisms
18. an animal that eats both plants and animals
20. a triangular, shaped solid object
23. a community of organisms interacting with its environment
25. the study of relationships between organisms and their environment
27. a series of interlocking links
29. a very strong breeze

WORD SEARCH

H A B I T A T N E M N O R I V N E
O E N O I T I T E P M O C A I R E
F O R E S T N H E E F O O D A C R
R T S B Z E S R P C H A H L O L C
E L D T I I O E R H O S E S C E H
M M E E F V I E E T R L Y O E A A
U S E G I B O D Y A O S O O G G I
S I N N S A W R M R T P E G N L N
N N R A A T A A E E E R R O Y A O
O A O H N U T D M R S O I L D V I
C G M C I F E E A R E T F I C I T
O R N D C L R T O P C C S D Y V A
Y O I E H Y I T O A T E U G O R L
O C V F E O A N R N A A R D T U U
T R O I N D D E A S A E T N O S P
E E R L E U T L E A N N A I U R O
N E E R C N P E L E E C S W O S P
T K P S I E Y T I N U M M O C N D

WORD SEARCH WORD LIST

AIR
ADAPTATION
ALGAE

BAT

CARNIVORE
CHAIN
COMMUNITY
COMPETITION
CONSUMER
COOPERATION
COYOTE
CREEK

DEER
DISEASE

ECOLOGY
ECOSYSTEM
ENERGY
ENVIRONMENT

FISH
FIRE
FLY
FOOD
FOREST

HABITAT
HERBIVORE

INTERACTION

LIFE

MARSH

NEEDS
NICHE

OMNIVORE
ORGANISM

PART
PLANT
POND
POPULATION
PREDATOR
PREY
PRODUCER

ROLE

SCUD
SOIL
SUN
SURVIVAL

WATER
WIND

WETLANDS

Name:_____

Date:_____

FOOD CHAINS

Using as much detail as possible, illustrate a food chain using only plants and animals that you observed in the pond today. The arrows show us the flow of energy through our food chain. Use the guides provided to help you decide which are producers, primary consumers, secondary consumers, and decomposers.

Plants produce their own food, so they are called PRODUCERS

Animals can't make their own food, so they are called CONSUMERS.

If an animal eats only plants it is a PRIMARY CONSUMER

If it eats only animals, it is a SECONDARY CONSUMER

When plants and animals die, they are broken down by DECOMPOSERS, which can be tiny (like bacteria) or quite big (like worms)

ADAPTATIONS

An ADAPTATION is a change to a plant or animals body or behavior that helps it to survive. We can observe these adaptations using our microboxes! Using as much detail as possible draw and/or describe the adaptations of each of these wetland animals...

Water strider:

Backswimmer:

Snail:

Dragonfly or damselfly nymph:

Your discovery!

WHAT'S IN A PARK?

Use this page to keep track of some of the things you discover.

List 5 human made changes you have seen in the Park:

1. _____
2. _____
3. _____
4. _____
5. _____

Did the human made changes seem to help or hurt the Park plants and animals? In what ways?

What do you think this area would look like if it were **not** a Park? Draw it.

THINGS I SAW

THINGS I HEARD

THINGS I TOUCHED

THINGS I SMELLED