

GRADE FOUR: WETLAND HABITATS AND COMMUNITIES BOOKLET

TO THE TEACHER

Welcome! This booklet has been designed to help teachers enhance the educational value and enjoyment of the 'Animal Habitats and Human Influence on Habitats' workshop. We recommend that workshop visits coincide with classroom studies of animal habitats. This collection of activities has been designed to meet several expectations of the Grade Four Science Curriculum. Our pre-visit activities have been designed to help students gain a foundation to help them more thoroughly understand what they will experience during the workshop. Additionally, follow-up activities have been provided to help students synthesize their observations and experiences. Most of the activities include working in cooperative groups, hands-on elements or provide a variety of choices in order to accommodate the needs of diverse learners. We hope you find this information useful and easy to incorporate into your classroom.

SCIENCE CONNECTIONS

Strand: Life Systems

Topic: Habitats and Communities

Expectations Met:

Understanding Basic Concepts

- ◆ identify, through observation, various factors that affect plants and animals in a specific habitat
- ◆ classify organisms according to their role in a food chain
- ◆ recognize that animals and plants live in specific habitats because they are dependent on those habitats and have adapted to them

Developing Skills of Inquiry, Design, and Communication

- ◆ use appropriate vocabulary, including correct science and technology terminology, in describing their investigations, explorations, and observations

Relating Science and Technology to the World Outside the School

- ◆ describe ways in which humans can affect the natural world
- ◆ show the effects on plants and animals of the loss of their natural habitat
- ◆ investigate the ways in which the extinction of a plant or animal species affects the rest of the natural community and humans

AGENDA

Please note that the order or location of some of these activities may change due to construction, weather or animal health concerns.

10:00	Welcome to the Toronto Zoo & outline of agenda, discuss "conservation" Define habitat, niche and adaptation, wetlands and characteristics of wetlands
10:20	Tour the Americas
11:40	Lunch. Please have everyone bring a lunch. There will be no opportunity to go to the restaurant
12:15	Discussion: The importance of wetlands (ecological services etc.)
12:45	Tour to the Americas Wetland Demonstration area (pH water testing)
2:00	Certificate presentation and close of program

PRE-WORKSHOP ACTIVITIES

1. WHAT DO WE KNOW?

Help encourage your students to practice making predictions and communicating their ideas through this activity. You will also have an opportunity to assess the prior knowledge or your students regarding concepts covered in the workshop.

As a whole class, discuss what students know and would like to know about what animals need in their habitats. All animals need food (for energy), oxygen, water, proper temperature, nutrients (minerals) and space. Record students' ideas on a large K-W-L chart. After finishing the workshop, revisit and complete the K-W-L chart.

K-W-L Chart:

What We Know	What we Want to Know	What We Learned

Tying It All Together

Language Strand: Oral and Visual Communication

- ask questions on a variety of topics and respond appropriately to the questions of others
- listen to others and stay on topic in group discussion

2. READ A BOOK!

Select a book from our Resource List and read it to your class to introduce some of the workshop topics. While reading, allow opportunities for students to make predictions about what is going to occur, comments on what is occurring, and what their opinion is of the topic after the book reading.

Tying It All Together

Language Strand: Reading

- read a variety of fiction and non-fiction materials
- make inferences while reading
- make judgements about what they read on the basis of evidence
- make predictions while reading a narrative piece on the basis of evidence
- develop their opinions by reading a variety of materials



3. ENVIRONMENT WEB

Through this activity, you can assess your students' prior knowledge about food chain concepts and introduce to them the idea of how living things are intimately connected.

Stand with your students in a large circle. You will hold a large ball of yarn and say aloud: "I am the algae in the ocean that depends on the sun to grow and survive". After saying this, throw the ball of yarn to a student using a one-hand overhand throw. This student will in turn name another living organism that depends on the algae to grow and survive (e.g. I am the _____ that depends on the algae to live). Students must use a one-hand overhand throw and will continue throwing the yarn until it reaches the last student. All students should hold on to a piece of the yarn before throwing it so that a web can be created. When the ball reaches the final student, he/she will then say "I am a human and have accidentally created an oil spill in the ocean" and proceed to sit down. When this student sits down, the rest of the class will be pulled towards this student (due to the yarn connections), thereby illustrating the interdependence of all living things on the earth.

Tying It All Together

Health and Physical Education Strand: Fundamental Movement Skills

-throw, both while stationary and while moving, a ball using a one-hand overhand motion to a partner or large stationary target, or pass and receive an object

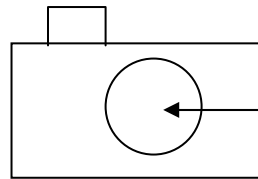
FOLLOW-UP ACTIVITIES

1. WETLAND HABITAT

Through this activity, your students will demonstrate their knowledge and understanding of wetland habitat components, pollution, and habitat destruction. This activity will provide you with an opportunity to assess your students' knowledge of these concepts.

After a discussion on wetland habitats and a review of how habitats can become destroyed (e.g. through the draining of wetlands, excessive littering, atmospheric pollution, trampling, hunting, introduction of non-native species, pesticides and herbicides, etc), students will demonstrate their understanding by illustrating a healthy wetland and one that has been negatively altered. The final product should clearly present the differences between a 'healthy' and 'sick' wetland through the use of at least two elements of design such as colour, line, shape, space, and texture. Suggested presentation formats include:

- placing the illustrations side-by-side on a large piece of paper (e.g. 'before' pollution on the left side and 'after' on the right)
- cut-out circles stapled and glued to the lens portion of a camera (see below)



'before' picture will be placed on top, and 'after' picture below it, thus creating a 'slide show' effect when the top picture is turned over

Tying It All Together

Visual Arts

-solve artistic problems in their artwork, using the elements of design specified for this grade
-produce two dimensional works of art that communicate thoughts, feelings, and ideas for specific purposes and to specific audiences

How To Assess

Teachers may take the following into account when assessing students' products

- Does the student use two or more elements of design in their piece?
- Does the student show a clear understanding of the difference between a healthy and sick habitat?
- Does the student show knowledge of the components that make up a wetland?
- Does the student show knowledge of the factors that cause habitats to become degraded?
- Can the student explain and justify the choices they made in creating their illustrations (e.g. color, size, etc.)

2. OUR COMMUNITY

Through this activity, students will demonstrate an understanding of habitats, communities, and will identify the needs and adaptations of animals in particular habitats.

As a class, students will select a region of the world for their project (e.g. African Savanna, Tropical Rainforest, Temperate Rainforest, Canadian Shield, etc) by a class vote. Once the region is decided, the teacher will have a predetermined set of animals and their habitats for students to select from and, in groups of three, students will choose (or be assigned) a particular animal and its habitat. Time should be set aside

for students to research their particular animal and its habitat. Once research is completed, groups will each receive a large piece of cardboard (size to be determined based on available display space in the school/classroom) on which to create and present their three-dimensional, free-standing animals and habitats. Each habitat should consider four important elements: food, water, shelter, and space. The animal should also be included in the habitat. When their products are completed, students will be given a chance to present them to the class, or to different groups.

Students will comment on others' products, describe any problems or challenges they had in the construction of their product, and explain the choices they made in the selection of materials used. This part of the activity should be preceded by a discussion on how to provide positive and constructive comments, as well as how to accept comments and criticism.

Following the presentations, the habitats will be placed side-by-side on a large presentation table in order to create a large community (e.g. African Savanna). In this way, students will be able to visualize the difference between habitats and communities.

Variation #1

This activity could be linked to the Social Studies Strand, Canada and World Connections, where students must describe the distinguishing physical features of regions within the provinces and territories. In this way, students can select a particular region of Canada (e.g. Great Lakes/St. Lawrence lowlands, interior plains, Appalachians) to study.

Variation #2

As an alternative to building a three-dimensional habitat, students can create an advertisement (e.g. in the form of a commercial or poster) for their habitat. The objective of the piece is to convince the *appropriate* 'animal buyers' to move to this area (e.g. you would not advertise the Interior Plains of Canada to the Atlantic Salmon). Through this, students can show their understanding of particular habitats and how they meet the needs of animals that live in them.

Tying It All Together

Visual Arts

- distinguish between relief and free-standing sculpture
- produce two- and three-dimensional works of art that communicate thoughts, feelings, and ideas for specific purposes and to specific audiences
- plan a work of art, identifying the artistic problem and a proposed solution
- identify strengths and areas for improvement in their own work and that of others

Language Strand: Oral and Visual Communication

- use some vocabulary learned in other subject areas in simple contexts
- listen to others and stay on topic in group discussion
- use appropriate strategies to organize and carry out group projects



Materials

(of the following, teachers can pick and choose, depending on availability)

plasticine	construction paper	foil	wax paper
yarn	toothpicks	pebbles	sand
glue	felt	tape	fabric
plastic wrap	popsicle sticks	dried leaves	cotton balls
paint	markers	crayons	pipe cleaners
wire	burlap		

Cardboard cut into equal sizes (required)

How To Assess

During evaluation, teachers may take the following into account:

- Did each student effectively contribute to the group?
- Did students work cooperatively within their group?

- Does the product contain the four elements of food, shelter, water, and space?
- Is the product three-dimensional and free-standing?
- Did the students give and receive comments in a constructive, positive manner?
- Participation in group discussion
- Use of appropriate vocabulary

3. TAKING ACTION THROUGH LETTER-WRITING

Through this activity, students will explore conservation issues (e.g. pollution, littering, habitat destruction) relevant to their community and use their knowledge to take action.

Here are some ideas for topics:

- protecting locally sensitive areas that have been threatened (e.g. Oak Ridges Moraine, wetlands)
- lack of recycling (in shopping malls, fast food restaurants)
- cleaning up litter in parks
- endangered species (e.g. sea turtles, tigers)
- Canadian rainforest (e.g. logging in British Columbia)

Examples of individuals/organizations the class can address the letter to (addresses can be found on government and corporate websites):

- local MPPs
- Provincial Premier
- Prime Minister
- Provincial Environment Minister
- Federal Environment Minister
- Mining and Forestry companies

Tying It All Together

Language Strand: Writing

- communicate ideas and information for a variety of purposes and to specific audiences
- begin to write for more complex purposes
- organize and develop ideas using paragraphs
- revise and edit their work, using feedback from the teacher and their peers
- proofread and correct their final drafts, focusing on grammar, punctuation, and spelling
- introduce vocabulary from other subject areas into their writing

4. FOOD CHAIN FILMSTRIP

Through this activity, students will be able to demonstrate their understanding of food chains as systems.

After a review and discussion on food chain concepts, students will individually create a food chain filmstrip. Each scene of the film should build upon the previous one in a logical sequence (e.g. Plants use energy from the sun to grow, rabbit eats the carrot in the first segment, then the fox eats the rabbit in the next segment). Students will accompany each segment with a few sentences describing what is occurring in the scene.

Tying It All Together

Visual Arts

- produce two-dimensional works of art that communicate thoughts, feelings, and ideas for specific purposes and to specific audiences

Language Strand: Writing

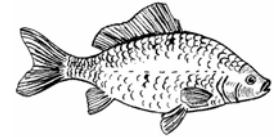
- communicate ideas and information for a variety of purposes and to specific audiences
- produce pieces of writing using a variety of specific forms and materials from other media to enhance their writing

- write simple and compound sentences
- introduce vocabulary from other subject areas into their writing

How To Assess

Teachers may consider the following in their evaluations:

- Does the filmstrip follow a logical sequence?
- Is each scene accompanied by appropriate text?
- Does the student use simple and compound sentences?
- Does the student demonstrate a clear understanding of food chain concepts?



5. MINI AQUATIC ECOSYSTEM

(adapted from Bosak, Susan. 2000. *Science Is*. Scholastic Canada Ltd.:Markham. Pg210)

In this activity students will create a closed aquatic ecosystem in a jar. The activity will demonstrate the important elements of a healthy ecosystem, and is easier to maintain than an aquarium.

Allow several large containers of tap water to stand for a few days so that the water is free of chlorine and well aerated. Place bottom sediments in a large empty jar. Place some aquatic plants into the jar (secure to the bottom with weights if necessary). Add small snails to the jar, then fill $\frac{3}{4}$ full with the aerated water. Close the lid securely and place jar near a window (avoid direct sunlight otherwise water temperatures will get too high). The ecosystem (particularly the plants) must have adequate light. Wait several weeks until the ecosystem becomes adapted to the light source. Put the fish in a sealed plastic bag. Put the bag and contents into the ecosystem so that the temperature of the water in the bag gradually becomes the same as the water in the ecosystem. After several hours, release the fish into the jar. After a few weeks, once the ecosystem is functioning and appears to be balanced, seal the jar by melting some paraffin wax and applying it around the lid so that no air can enter or escape.

There are certain keys to set-up that will allow the jar's contents to function as an ecosystem. Balancing the ecosystem can be tricky, especially with a smaller jar. Filling the jar only three quarters full of water, leaves the remaining quarter for air. The amount of oxygen in the air and water is constantly replenished by green plants, which give off oxygen during the day when they manufacture food for themselves (photosynthesis). Although algae may work in a closed aquatic ecosystem, they aren't ideal because they reproduce rapidly and use up a lot of oxygen as they decompose. Elodea are a better plant choice. The plants provide animals in the ecosystem with food and oxygen. The fish must be plant-eaters, tolerant of salinity and be able to survive in low-oxygen conditions. Snails in a closed aquatic ecosystem act as consumers as well as decomposers. IF the ecosystem is a balanced one, the animals should never go hungry. If their population becomes too large for the food supply, the weaker members will die off until their numbers are in proportion to the food available.

As the ecosystem is being developed students should record their observations of the changes that they see. They can also make predictions of what they think will happen in the coming days. Once the ecosystem is complete they can use their observations to write a brief report about the methods used to create the ecosystem, and how it works. Students can also research other ecosystems to discover how their mini ecosystem is similar to natural ecosystems. Remember that the only experiment that is a failure is one from which we learn nothing. If your ecosystem should die discuss some of the possible causes and consider trying again.

Tying It All Together

Language: Writing

- communicate ideas and information for a variety of purposes and to specific audiences

Materials

Large, very clean jar (at least 3-4 litres, ideally, 15-27 liters) with lid; Aquatic plants (elodea);
 Animals (snails and 3-4 small mollies); 6-8cm of bottom sediments (sand, gravel);
 Water in large containers; Optional – paraffin wax

6. THE ENDANGERED HOPPIT

(adapted from Bosak, Susan. 2000. *Science Is*. Scholastic Canada Ltd.:Markham. Pg356.)

This activity reinforces the concept of extinction as an imaginary creature called a hoppit is threatened with extinction.

Mark off a small “home” area with masking tape. Spread small objects throughout a larger playing area. Students become “hoppits”. Hoppits are imaginary creatures, which hop. Their life consists of gathering as much food (small objects) from the ground as possible. The object of the game is for hoppits to keep hopping and gathering food. Hoppits collect their food in a small pile in the home area, they can also stop hopping and rest in the home area. To start the game, hoppits hop about on two legs and gather food. They can pick up only one piece of food (object) at a time and take it to their food pile. Each hoppit has its own food pile in the home area, and tries to keep the pile at least as large as other piles. After about 10 minutes, hoppits are told that bad weather has made it harder to get food. This harder life is represented by hoppits now being able to hop on one leg only. If a hoppit hops on two legs, it “dies” and is out of the game. The one-legged hoppits should hop about and gather food for another 5-10 minutes. Hoppits are now told that humans have built a shopping plaza on their home. Hoppits can leave their food piles where they are, but can no longer stop and rest in the home area. To stay alive, hoppits must *continuously* hop on one leg, while adding to their food piles.

How many hoppits survive after 5 minutes? 10 minutes? 20 minutes? At least two hoppits must survive for the species to continue. Discuss the reasons for the hoppits’ extinction.

Tying It All Together

Physical and Health Education Strand: Fundamental Movement Skills

-combine locomotion/travelling skills in repeatable sequences, incorporating a variety of speeds and levels

Physical and Health Education Strand: Active Participation

-follow the rules of fair play in games and activities

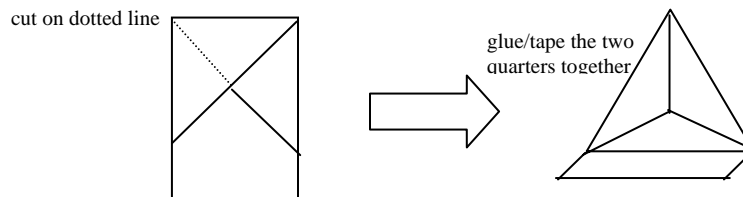
-demonstrate respectful behaviour towards others in the group



7. BUILDING HABITATS

Through this activity, students will demonstrate their understanding of different types of habitats.

In pairs, students will construct four separate ‘trioramas’. Using a regular 8.5x11-inch paper, fold it into quarters (triangles) and cut from the corner of one edge along the fold line to the center spot. Fold this flap in and glue it to the next. The sheet should look like this (solid lines represent folds in the paper):



Students will select and construct four habitats in each triorama: tropical rainforest, desert, grassland, wetland, or ocean. The front rectangular flap of each triorama will contain a description of the habitat that is displayed. The trioramas can be glued together to form a square unit, with four scenes. Students may be given the opportunity to present and display their habitats to the rest of the class.

Tying It All Together

Visual Arts

- demonstrate awareness that the overlapping of shapes is one way of creating the illusion of depth
- produce three-dimensional works of art that communicate thoughts, feelings, and ideas for specific purposes and to specific audiences
- plan a work of art, identifying the artistic problem and a proposed solution

Language Strand: Writing

- communicate ideas and information for a variety of purposes and to specific audiences
- produce pieces of writing using a variety of specific forms and materials from other media to enhance their writing
- introduce vocabulary from other subject areas into their writing

Materials

Four sheets of paper per group

Scissors

Glue

Variety of classroom materials (e.g. plasticine, toothpicks, felt, pipe cleaners) for building the habitat

How To Assess

Consider the following points in your assessment:

- Individual participation and contribution to product
- Cooperation among group members
- Clear visual distinction between different habitats (each has different characteristics)
- Appropriate labeling and description of habitat
- Appropriate characteristics for each habitat

SUMMARY

The following is a general summary of the major concepts covered in the workshop.

Habitat, Community and Niche

Habitat, community and niche are terms that describe an animals environment and its role in its environment. Animals and plants have special characteristics or features, which allow them to be suited to their habitat and niche. Examples seen in the workshop include:

-Elephant

- ~ habitat is African Savannah or semi-desert
- ~ its role (niche) is consumer, keystone species (it affects the environment in ways that allow many other species to thrive), and bulldozer
- ~ adaptations are trunk (used for communication, lifting, touching etc.), tusks (used for digging, fighting), skin (wrinkles for cooling), and ears (movement for cooling)

-Otter

- ~ habitat is rivers, lakes and creeks
- ~ niche is a carnivore of fish, crustaceans, and frogs
- ~ adaptations are webbed toes and steam-lined body for swimming, waterproof fur, and teeth shaped for eating meat

-Massasauga Rattle Snake

- ~ habitat is swampy wetlands and woodlands
- ~ niche is carnivore of mice, frogs and small birds
- ~ adaptations are a rattle to ward off danger, colouration for camouflage in habitat, hinged fangs that inject venom into prey that prevents blood from clotting, and heat sensitive pits to help detect temperature changes and find prey in the dark

Human Influence on Animal Habitat

Humans can influence animal habitat by, cutting down forests for cattle grazing and to accommodate increasing human population, using pesticides and herbicides, pollution, littering, and cutting down meadows. Loss of habitat is the number one reason for endangerment of animals and plants. Some of the main reasons for species becoming endangered include, loss of habitat (cheetahs), killed for pelts, skins or feathers (cats and birds), killed for medicinal reasons (tiger bones), over collected for food (whales), and pet market (small primates). While extinction is a natural process (e.g. dinosaurs), human influence has accelerated the rate of extinction as animals cannot adapt to rapid environmental changes. Conservation is increasingly important for the preservation of habitat and species for future generations. Examples of endangered species include:

-Great Indian Rhinoceros

~ habitat is tall grass near moist area used for wallows, found in India, and other parts of Southern Asia

~ reason for decline is loss of habitat due to farming, cattle diseases, sport hunting and oriental medicines

~ conservation actions have included captive breeding programs and protection

-Lowland Gorilla

~ habitat is West African rainforest

~ reason for decline is destruction of habitat, hunted for meat, pets, body parts for lucky charms, and war

~ conservation actions have included captive breeding programs and protection

Food Chains

Food chains are composed of producers, consumers and decomposers. Each component is dependent on another for long-term survival. Changes in one member of the chain (e.g. pesticide spraying on plants) will eventually affect others (e.g. the herbivores eating sprayed plants).

VOCABULARY

Adaptation	Special characteristics or features animals/plants have developed which make them better suited to their habitat and niche in nature
Community	All the living things in an area
Conservation	The act of protecting and preserving plants, animals, and their environment or habitat; planned management of a natural resource to prevent exploitation, destruction or neglect.
Consumer	A living thing that must eat other living things to survive
Decomposer	A living organism that breaks down dead animals or plants in order to get food.
Endangered	A species whose population is down 50% in the last decade, or whose habitat is less than 500 square kilometers, or where there are less than 2500 individuals or 250 matured individuals, or a species in immediate danger of extinction
Extinct	The total loss of a species in all parts of the world
Habitat	The type of environment where and animal or plant species lives; components include food, water, shelter and space.
Niche	The role or place an animal occupies in its environment or habitat
Producer	A green plant that makes food which is the first step in a food chain; photosynthesis is the process by which plants makes and stores food

RESOURCES

General

<http://www.ontarionature.org/educate/activities.html> (T)

This site includes ideas and activities if your class wants to get involved in conservation.

<http://chemeng.nmsu.edu/lorax.htm> (T&S)

Full-text of the story "The Lorax" by Dr. Seuss. It is a great story to read to your kids to introduce to them the concept of sustainability, habitat destruction, and the importance of conservation. Students can even write an sequel to the story as it ends on an unfinished note.

<http://www.science.ca/> (S&T)

Excellent searchable, Canadian website with a wealth of information. Includes current science news and events, the opportunity to interview a Canadian Scientist, an area to post questions on specific topics, an activities resource, and a 'questions of the week' section posted by Canadian students.

<http://school.discovery.com/teachingtools/teachingtools.html> (T)

Quick and easy-to-use worksheet generators.

www.aliexplorer.com/clipart/home.html (T)

Selection of animal and plant clipart.

Endangered Species

www.cbc4kids.ca/general/the-lab/endangered/default.html (S&T)

General information on endangered species of Canada, monthly profile of a species at risk from the COSEWIC endangered list, and lots of pictures and fact sheets.

Habitats

www.greecenyc.com/1s/grade4 (S&T)

This site is called "Animal Habitats" and was designed by grade four students. It contains a list of different habitats with a description of the different animals that live in those habitats. Very easy to read.

www.enchantedlearning.com/biomes (T)

This site has general descriptions of a wide variety of habitats throughout the world.

<http://www.osee.org/> (T)

This site contains useful links and excellent resources for environmental educators. Contact Bill Andrews for information on the OSEE Curriculum Project, a rich resource for elementary science.

Books

Degler, Teri. 1990. The Canadian Junior Green Guide. McClelland and Stewart: Toronto.

Ideas and activities for students interested in environmental issues and action.

Schimmel, Schirm. 1994. Dear Children of the Earth, A Letter from Home. Northward Press: Minnetonka, Minnesota.

A fictional picture book with a positive message about environmental appreciation.

Wright, Alexandra. 1992. Will We Miss Them? Charlesbridge Publishing: Watertown MA.

A non-fiction picture book about endangered species.



Animal
Crackers
by Fred
Wagner