FOREST EXPLORE

Conservation Discovery School Program

ANN & SANDY CROSS CONSERVATION AREA

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1.0 OVERVIEW

1.1 PROGRAM SUMMARY

Through this daylong outdoor program Grade 6 students will have the opportunity to explore the Aspen Forest of the Ann & Sandy Cross Conservation Area. While hiking with an ASCCA Volunteer or Staff guide, students will make nature observations and practice plant identification. Through other hands-on activities and games students learn about trees and forests, forest ecology, and the value of forests to wildlife and humans. We ask that the school provide a volunteer to student ratio of 1:6 for their class. Distance traveled during the program is approximately 3.5 km.

1.2 CONCEPTS AND OBJECTIVES

Forests are trees, but much more than trees. Foothills Parkland, and its Aspen woodlands provide important habitat (i.e., food, shelter, space, and water) for a variety of wildlife and plant species. Forest species have adapted to the conditions, created in part, by the trees of the forest. This forest community also meets many human needs, including recreational and economic needs.

After participating in the program, students will be able to:

OBJECTIVES	KEY POINTS
1) Distinguish between trees and other types of plants.	Trees are single-stemmed woody plants that are usually taller than 10 feet (+2 m) at maturity.
2) Describe and classify leaf shapes, leaf arrangements, branching patterns, and overall form of a tree.	Vegetation has different patterns, shapes and forms. Important to classification of trees and shrubs are leaf type, leaf shape, leaf margin, and leaf arrangement.
3) Distinguish between deciduous and coniferous trees, and identify three examples.	There are two main categories of trees. Coniferous trees have long needle-like leaves and are evergreen (e.g., White Spruce). Deciduous trees have broad leaves that fall off each year and are replaced (e.g., Trembling aspen and Balsam poplar).
4) Recognize that forests co-exist with other habitats and list two stakeholders (anyone or thing that has an interest) that value grasslands, forests, or both.	Forests exist beside other habitats such as grasslands. People or wildlife may value one habitat more than another or several habitats at the same time. For example, a rancher may value grasslands as range for cattle. A forester may value the forest for lumber production. These competing interests must be balanced for both habitats to remain healthy.

5) Give an example of a forest food chain.	Food chains follow the pattern. Young Aspen trees, a producer, are a winter food source for many animals including the Snowshoe hare, a herbivore, which in turn is often eaten by cougar, a carnivore.
6) Give two reasons why forests are valued by humans.	Forests are a valued resource. They are both an economic resource and a recreational resource to humans.
7) Show respect by following Area rules and explain why these rules are important.	Area rules are in place to help protect and conserve the Area for wildlife and humans.
8) List two actions that threaten, and two actions that enhance forest survival.	Human action threatens forests in the form of aggressive forestry and careless fire practices. General lack of knowledge and appreciation of forests also threaten forests survival. Conservation projects, tree planting and a knowledge and appreciation for forests will go a long way in preserving and enhancing forest survival.

1.3 CURRICULUM CONNECTIONS (Grade 6)

Science
- Activities relate to Trees and Forests (SLE's 1, 2, 4, 5, 6, 8 & 9).

Mathematics
- Math activities in the program include measurements, problem solving, and pattern identification.

Language Arts
- Writing skills are included as students' record information and observations on-site and translate it into poetry/stories/reports on-site or back at school.

Art
- Drawing skills are incorporated as students draw and sketch.

Health
- Life Careers

Physical Education
- Outdoor Pursuits, including hiking preparations (3.5 km hike) and active games during the outing.

2.0 PRE-VISIT ACTIVITIES

2.1 GET INVOLVED, "TAKE ACTION"

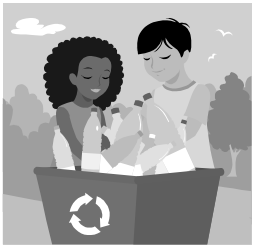
New at Cross Conservation Area! The Ann & Sandy Cross Conservation Area is encouraging youth to take actions that will help protect wildlife and conserve their natural habitats both at the Cross Conservation Area and in their own community.

We wish all students to share their experiences and photos on our website, which could include your visit to the Cross Conservation Area or your own initiatives, from litter-free lunches, building bird boxes or replanting school yards. Let us know any ideas you have for an action plan and we would be happy to promote your successes on our website and provide you with available resources to help make your class' vision a success.

We encourage you to ask your students to envision a way that they can **"Take Action for Wildlife"**.

For more information or ideas for initiatives please visit our Take Action Page!

TELL US ABOUT IT



You made a difference! Let us know what actions you have taken to reduce your Eco Footprint. Send us a paragraph and a couple of pictures and your actions could be highlighted on our website to inspire others!

Send your submissions by email to: info@crossconservation.org.
Note: any pictures sent in should have media consent.

2.2 "PICK A PROJECT" DONATION

Objective

This will assist students in understanding that they can take positive action in conservation. It will also assist teachers in developing student values with respect to the environment. * Note: This donation program is entirely optional.

Procedure

1) Describe the Cross Donation and its ongoing conservation effort.

2) Tell the students you will be visiting this natural area and it is important that it be preserved for future education. Describe our Pick a Project Donation Program and ask them to Pick a Project they think they would like to financially support.

   Sample projects could be: purchasing a class set of magnifying glasses, contributing funds to an ecological study on the area, or purchasing native grass seed for reclamation. Other specific projects will be discussed at the in-service prior to your visit.

3) Some fund-raising options could be:
   - Have each child make a small donation ($1) to a collection
   - Hold a bake sale or car wash
   - Conduct a BOTTLE DRIVE, recycle and contribute to conservation at the same time!
   - Sell artwork, poetry, cards made from experiences at the Cross Conservation Area.

4) For groups that find time or money to be a concern, consider a donation of a service on the visit day. For example, arranging to have the whole class help out with the area, (e.g., cleaning up after themselves before returning to school, picking up garbage on the trail, or growing some native plants in the classroom and returning to transplant them here).

5) This activity is not meant solely as a fund-raiser, but as a means to encourage students to become actively involved in a conservation effort and to enhance the area for future visits.

6) Have the students prepared to make a presentation of their donation to ASCCA staff on the visit day. This will give us a chance to personally thank the students. We will give each class a special certificate as a small token of our appreciation. If you make a donation after your visit, we will send you the certificate to your class.

2.3 FOREST EMBLEMS

Objective

Students will gain an appreciation of Canadian and provincial symbols that come from the forest.

Background

Almost half of Canada is covered in forest. These forests can be divided up into 13 types, with the Boreal forest stretching from Newfoundland to B.C. Much of the forest in Alberta is Boreal. Forests are familiar to all Canadians and 1 in 15 jobs are derived from forests. We are the largest exporter of forest products in the world, therefore, it should be no surprise that some of our national identity is derived from forests.

Procedure

Discuss forest emblems with the class.

1) First discuss the Canadian flag.
   The maple leaf on the Canadian flag is generic (it doesn't accurately represent any of the native maples), and represents the ten types of maple found in Canada. Maples can be found almost everywhere in Canada. In Alberta we can find the Manitoba maple.

2) Do students know what Alberta's provincial tree is?

Alberta chose the Lodgepole pine (Pinus contorta) for its provincial tree. The common name comes from the practice of using this tall straight tree for tipi poles. You may also discuss other provincial trees.

3) Discuss other emblems including Alberta's provincial bird, the Great Horned owl, a forest dweller, and the beaver, an animal that depends on trees for its food and lodgings. Even Canadian sports teams use forest species as emblems (e.g., the Toronto Maple Leafs, or Toronto Blue Jays). When you look at all these examples, it's easy to see that forests are important to Canadians.

4) Have students design an emblem for themselves, as a class, or in groups, using forests and forest species.

2.4 KIDS CAN KEY!

Objective

The students will understand how to identify things by using a dichotomous key.

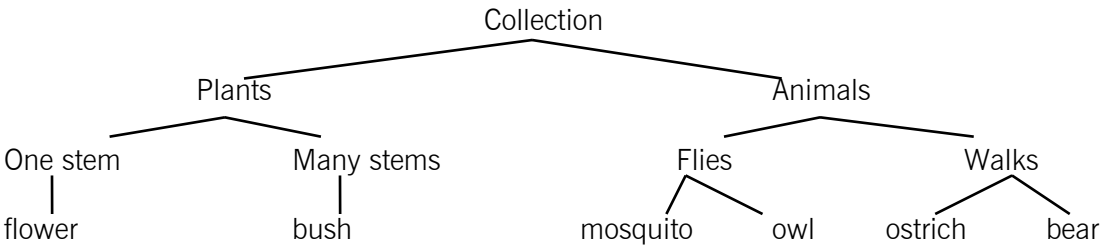
Procedure

1) Explain the process of elimination in classifying any organism, and let the students look at how a key works. For any choice or characteristic there are only two choices. The object is either green, or it isn't. If it isn't green it's something else.

2) As a class exercise, have the students make a key of the people in their class on the chalkboard. You may use identifiers such as colour of clothing, or hair as long as the children are advised that these identifiers have no bearing on other characteristics of the individual.

3) You may also use shoes or books for a more physically active keying activity. Students each contribute one shoe, physically classify them, and build a key on the floor.

4) Have kids work individually or in small groups. Give each group several pictures of plants and animals and assign them to develop a key starting with the group and branching down to individual plants and animals, pasting or drawing each animal that corresponds to that branch. For example:



5) Allow children to make up their own distinctions (e.g., flies, walks) related to what is most important to them. This activity could also be done with local trees and shrubs.

6) Have the groups share their keys with the class, and discuss the different distinctions each group used. Have children consider how another culture or isolated region may use different distinctions. If you lived in the north pole you wouldn't need to separate frogs from seals, if you only ate plants, perhaps you wouldn't classify animals beyond dangerous and non-dangerous.

3.0 ON-SITE VISIT

3.1 A TYPICAL ON-SITE VISIT

9:30 a.m. Your group arrives by bus at the Cross Conservation Area.
- Please drop off and pick up in the lower parking lot and walk up to Belvedere House.
- Organize group in orientation area.

9:45 a.m. Orientation talk given by ASCCA staff or volunteer.
Orientation will:
- Welcome students.
- Introduce them to the Cross Conservation Area.
- Review area rules and expected behavior.
- Introduce them to the program.
- Accept a Pick a Project donation (if applicable).

10:00 a.m. Snack and bathroom break inside. Teachers divide students into groups.

10:15 a.m. If there are two classes, one class stays behind to do an activity to allow the other class to get ahead.

12:00 p.m. Lunch break at Haunted Barn picnic shelter. Optional Games.

12:30 p.m. Classes resume investigation.

1:50 p.m. Classes return to building for washroom break and wrap-up talk by ASCCA staff or volunteer.

2:00 p.m. Group heads back to school.

3.2 SUMMARY OF ACTIVITIES

Part I Activities	Part II Activities
Clueless	Balancing Act
Keys to the Forest	Nature's Nutritionist
Mystery Plant	Oh Deer!
Forestry Friends	Forest Values

3.3 ON-SITE PROGRAM DESCRIPTIONS

PART I ACTIVITIES

CLUELESS

ACTIVITY DESCRIPTION:
Each group is required to identify a mystery plant which will be the Aboriginal cure for a specific ailment. Students systematically describe the different leaf features on each sample.

TIME REQ'D: 20 minutes LEADER: ASCCA guide

MATERIALS NEEDED:
We provide: Visual Aids, Plant Samples with ailment card and Activity Sheets

BACKGROUND:
All plants have characteristics that make them plants. Each species of plant has a unique arrangement of features that makes it different from all others. Plants with similar features are often grouped together into families. Scientists use these features to classify plants. This unique combination of features is what we will use to identify them.
Reproductive structures, flowers and fruit, are often important for identification, but are not always present. Leaves, branching patterns, bark, and other structures can be used to identify families and species of trees and shrubs. Shapes, types, arrangement and margins of leaves are key observable characteristics used to identify trees and shrubs. We will restrict ourselves to these features, focusing on leaves.
The First Nations people depended on local plants as medicine. This knowledge was passed down through generations by identifying and describing the unique characteristics of the plant. Most of the medicine that we have now is produced synthetically; however it was originally derived from plants. There are still many plant species that have not been studied and many may contain medicinal or other properties that are beneficial to humans.

DIRECTIONS:
1. Introduce the students to their ailment card and plant samples and explain their goal is to identify the mystery plant that will cure their condition.
2. Briefly review the different parts of plants (handout/vocabulary/laminated sheet) and growth patterns.
3. Introduce students to the Clueless chart in the student booklet.
4. Break students into their small groups. Give students a set time to observe and record information about their plant samples.
5. Bring the class back together. Review terms and common features.
6. Explain why knowing these terms will help them with identifying their mystery plant.

KEYS TO THE FOREST

ACTIVITY DESCRIPTION:
This activity introduces students to a real plant key to identify trees and shrubs. These keys are used by many types of scientists and outdoors people. This activity will use the new vocabulary they have learned to help them figure out the name of their mystery plant and other samples.

TIME REQ'D: 20-30 minutes **LEADER:** ASCCA guide

MATERIALS NEEDED:
We provide: Dichotomous keys and activity sheets

BACKGROUND:
Dichotomous keys, based on a series of choices between alternative characteristics, are the standard in plant identification. Starting with a basic characteristic the key asks you to characterize the plant as either one thing or the other (e.g., needle leaf or broad leaf). At each step of the key your response to the statement will lead you to another characteristic. After a series of steps the key will give you the scientific name of the plant and usually a description of the plant.

A tree is a woody perennial, usually with one main stem/trunk, generally standing more than 10 ft (2m) at maturity. A shrub is a woody perennial with several stems originating from a clump, usually no higher than 7 ft. Stress and growing conditions affect trees and can cause deformities and dwarf trees. Some shrubs like the Choke Cherry often look more or less like trees, with one or two stems. No distinct line can be drawn between trees and shrubs; therefore they are often grouped together.

The vocabulary and key we will be using refers primarily to leaves. All native trees and shrubs in Alberta can be divided into two groups according to leaf type, needle-like or broadleaf. Other important characteristics are leaf arrangement (alternate or opposite), leaf shape, leaf type (simple or compound) and leaf margins (smooth or serrated). The guide or key used will be "Guide to Common Native Trees and Shrubs of Alberta," written by Wayne Inkpen and Rob Van Eyk. This publication is available through Inside Education and is meant to be used by those without a botanical background and is at a level most Grade 6 students can use with assistance.

DIRECTIONS:
1. A possible introductory game for this activity is the "Kids Can Key" activity included in the pre-visit activities. Using the class, you can divide them or classify them according to their different characteristics (e.g., girls or boys, hats or no hats). Have the students guess how you are dividing the class.
2. Introduce students to the key and demonstrate by keying out a sample plant.
3. In groups have students read through the key and discuss any vocabulary. Have them key out their three plant samples. Give a time limit.
4. Review the steps with groups when possible if the plant does not fit the description or look like the picture. Where did they go wrong?
5. Bring students back together and discuss findings. What did they find challenging?

Besides medicinal purposes, why else might they want to know the name of a plant? Who else might want to know about the plant?

Answer: foods, poisons, rare plants, arborists, foresters, landscape designers, botanists, gardeners etc

MYSTERY PLANT

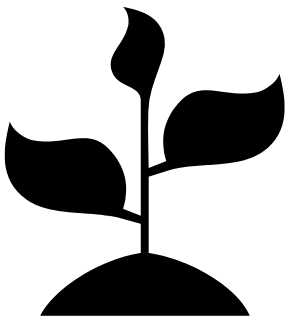
ACTIVITY DESCRIPTION:
Students present their findings about their mystery plants to their classmates. Students practice using the new vocabulary to tell others about the features they observed.

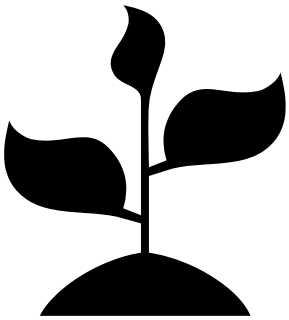
TIME REQ'D: 20 minutes LEADER: ASCCA guide

MATERIALS NEEDED:
We provide: Activity Sheets and guide books

BACKGROUND:
For any scientist, observation and communication are key skills needed to be successful. Deciding what is important to observe depends on the task. Communicating this is a challenge for many. A common reference or vocabulary is necessary. The vocabulary and skills can be learned (e.g., the child's game I Spy).
To identify anything you must be able to characterize its features.

DIRECTIONS:
1. In small groups, have the students answer the questions in the booklet about their mystery plant.
2. Get the students to imagine they are the medicine man of the tribe. How would they describe this plant to someone else so the person could go into the forest and find it themselves? Emphasize that this takes years of knowledge and should not experiment.
3. Have the students prepare a short presentation about their mystery plant including the ailment and how the plant was used as a cure. Give time limit.
4. Presentations should include a detailed description of the plant and other interesting facts.
5. As you continue on along with the day, have the students try to find their plant growing along the trail.





FORESTRY FRIENDS

ACTIVITY DESCRIPTION:
This is a hands on investigation of the forests' trees. Students team up and take some basic tree measurements.

TIME REQ'D: 20 minutes **LEADER:** ASCCA guide

MATERIALS NEEDED:
We provide: Rulers and measuring tapes You provide: Pencils and Activity Sheets

BACKGROUND:
No forest ecology study would be complete without some type of tree measurements. Here in pairs or groups students measure the height of a tree. Forest ecologists would probably go on to measure circumference and determine area (area of trees in a plot), age, and species. Foresters often do the same types of measurements to help them decide on the age and productivity of a forest. With the help of tables, the volume of a tree can also be estimated. The wood volume of some common objects are, 0.0001 cubic meters for a pencil, 0.0031 cubic meters for a hockey stick, and 0.5150 cubic meters for a picnic table.
There are many methods to measure height indirectly, without climbing the tree or cutting it down. The two methods described here require at least two people, one at the base of the tree and another at a distance from the tree. The "pencil method" uses estimation and requires no measuring equipment. Have someone hold a pencil or another object at arms length so that the top and bottom of the object line up with the top and bottom of the tree. Keeping the bottom of the object and tree base lined up turn the object to a horizontal position. Have another person walk from the base of the tree, at a right angle from the first person, to the end of the object. The person walking may estimate the distance by using their pace. You could also have students measure back to the base of the tree with a measuring tape.
The "ratio method" involves some calculation and use of a ruler. Have one student hold the ruler at arms length so that the top and bottom of the ruler line up with the top and bottom of the tree. Have the second student stand at the base of the tree. Have the first student record where the second student's head (top of their head) is on the ruler. Divide the length of the ruler (number of centimeters) that represents the height of the tree by the height of the student on the ruler. Multiply the second student's actual height by the number calculated from the ratio. This should give you the height of the tree.

DIRECTIONS:
1. See "Be a Tree" activity under optional activities as a possible lead-up to this activity.
2. Demonstrate and describe to students the method you would like them to use to measure the height of a tree.
3. Have students divide up into pairs and distribute equipment (rulers and flexible tape measures). Have each group select a tree to measure. Remind students to be particularly careful if they are walking backwards to line things up.
4. Take out the tree cookies and have students break into groups and count the growth rings. Discuss how many rings each group counted, what the rings mean and why they may be spaced differently. Are there any interesting inconsistencies or special markings on the tree cookies?

5. Discuss how other tree measurements are useful for different reasons. To calculate diameter, necessary to determine area or volume, you must first measure circumference. At approximately 1 m above the ground use a flexible tape measure to determine the circumference. Diameter is calculated by dividing the circumference by pi, or 3.1416. . Area is calculated by multiplying pi by the radius squared. Radius is half of the diameter.

OPTIONAL LUNCH TIME GAMES

These games can be played at lunch, or any other time during the day if time permits.

Build a Tree (taken from Sharing Nature with Childen II by Joseph Cornell)

Students co-operatively act out the parts of a tree. Gather students and explain that they are going to look at a tree from the inside out.

In Build a Tree, players act out the various parts of a tree: the taproot, lateral roots, heartwood, sapwood, phloem/cambium, and bark. The heartwood section pantomimes providing strength and support for the tree. The roots (taproot and lateral) anchor the tree in the ground and draw up water and trace minerals. The sapwood carries water up to the branches and leaves. The cambium is the growing part of the tree. The phloem carries food from the leaves to the rest of the tree, and the bark protects the tree.

Heartwood

Select 2 students for the heartwood. They should stand back to back. Tell them they are the core of the tree and their job is to stand tall and strong.

Taproot

Select 2-3 for taproots. Have them sit, backs to the heartwood, legs outstretched. Their job is to enable the tree to get water from deep in the earth and anchor the tree firmly to the ground. They can make slurping noises as they take in water through the roots.

Lateral Roots

Select 2-3 to be fibrous roots. They lie on the ground outstretched. Their job is extracting water from the soil. They also make slurping noises as they take in water through the roots.

Sapwood/Xylem

Select 4-5 to be xylem. They stand around the heartwood, hands joined. Their job is to draw water up from the roots and lift it to the trees highest branches. They raise their hands as they shout, “Wee” as they bring the water up. Select 2 for leaves, joined to the xylem. They raise their unclasped arms to the sun, and shout "Yippee!" because making food is fun.

Cambium/Phloem

Select 5-6 to be phloem. Circled around the xylem hands joined is the phloem. Their job is to carry the food manufactured by the leaves and distribute it to the rest of the tree. The phloem shouts, "Voom!" lowering their hands to the ground because phloem carries food to the roots.

Bark

All but 1 of the remaining group should be the bark. They protect the rest of the tree.

Boring Beetle

The last person is an insect, a “boring” beetle. When the tree is set in motion with all its noises and movements the bug tries to reach the heartwood. If successful this would be harmful to the tree, since wounds make it possible for organisms to infect the tree and weaken or kill it. You can also show how hazardous removal of bark can be to a tree.

Once the tree is assembled, give the commands for the tree parts: 1)"Heartwood, stand tall and strong!" and "Get tough, Bark!" 2)"Roots, let's slurp! 3)"Leaves, let's make food!" 4)"Sapwood, bring the water up!" 5)"Phloem, bring the food down!" After the first round, just shout the commands without giving the names of the tree parts.

Camouflage

This game can be played anywhere along the trail but is best played in tall grass. Make sure that the spot that is chosen is free of any hazards (e.g., barbwire, Stinging Nettle). Set the boundaries for the game using your parent volunteers as boundary markers. At no time should the students go beyond these boundaries.

This game can be explained in predator-prey terms. Ask them what they think some of the different adaptations grassland animals need to escape predation: speed, burrowing, camouflage! One of the group or an adult (it is great to start with the teacher) is a predator, and the rest are prey. While the predator turns their back, the prey moves into the background trying to find a hiding place. The predator turns around and sees how many prey they can find without moving. The predator calls out a person’s name if they can see them. Once all the visible prey is found, the predator calls, "Camouflage!" and all the remaining prey stand-up.

An extension to this game is to have the students’ journal or to share their experience hiding in the grass or the forest. It is amazing what they experience when they are quiet and still!

Web of Life

Gather kids into circles of about 10 each and stand shoulder to shoulder facing in. Explain that they are going to make the web of life and then untangle it. Reach over and shake hands and hold on. Take another hand and hold on. Make sure you don't get the person next to you or same person as first hand. Untangle it without letting go, caution not to hurt each other, help them when needed (if they are getting frustrated). End by discussing how all things in nature are connected like the strands in a web.

PART II ACTIVITIES

FOOD CHAIN GAMES

ACTIVITY DESCRIPTION:
Students are introduced to forest food chains and food pyramids through an active game (e.g., Food Chain Game, Frozen Food Chain Tag or Nature's Nutritionist.

TIME REQ'D: 30 minutes **LEADER:** ASCCA guide

MATERIALS NEEDED:
We provide: Laminated character cards on coloured paper (Food Chain Game) or Food Chips (e.g., Honeycomb Cereal) (Nature's Nutritionist)

BACKGROUND:
A food pyramid is one of the many types of relationships in an ecosystem. All energy comes from the sun and is converted to a usable form by plants we call producers. Animals, or consumers, that eat primarily plants are called herbivores. They must eat several pounds of plant material to produce a pound of flesh. Animals that eat other animals are called carnivores. Some animals, like man, eat from both groups and are called omnivores. Considering an ecosystem's natural cycles helps us to understand how it functions. Food chains, pyramids, and webs are part of the larger, more complicated nutrient cycle of an ecosystem. The nutrient cycle is incomplete without another class of organisms, the decomposers. Decomposers break down organic materials into nutrients that plants can reuse. Decomposers are the recyclers in ecosystems.
Although animals eat a variety of food sources, the simplified food pyramid helps show that they must eat or consume energy to survive. Animals at the top of the food pyramid in the forest include; the cougar, the coyote, the fox, the owl, and the Pileated woodpecker. These carnivores rely on an even greater number of herbivores and omnivores. Forest herbivores include; moose, elk, and deer, porcupines, Snowshoe hare, voles, and insects. Forest omnivores include Black bears and skunks. The Aspen tree provides not only shelter, but food for most of these animals. Herbivores may also eat berries, such as Saskatoons and rose hips, bark, buds and lush leafy herbs such as Pea vine and ferns.

DIRECTIONS FOR FROZEN FOOD CHAIN TAG:
1. Start with a large habitat and reduce size.
2. Like frozen tag, mice run around and owls chase them.
3. When caught the mice freeze and turn into grass, stick arms out and can only be unfrozen by another mouse running underneath their arms.

DIRECTIONS FOR NATURE'S NUTRITIONIST:
1. Set up the game by introducing the concept of food chains and pyramids, with examples.
2. Students choose to be a grass, a Snowshoe hare, or a Cougar. Physically divide the 3 groups.
3. You are the sun and you radiate energy onto the plants, so they can make their food. Give all the Aspen trees 2 food chips. To grow the trees eat 1 of the food chips. The other is stored energy.
4. Have the hares feed. Give a time limit for them to tag the trees, and collect food chips.
5. Gather the hares back together. Did they all get a food chip? If not they die. If they got 1 they lived, but are weak (sit out, no energy to pass on). If they got 2 they are healthy. If they got more they are fat. All hare that collected food chips eat 1; the rest is stored

energy that they can pass on to cougars.
6. Now it is time for the cougar to eat. Again set a time limit, and boundaries. Cougar tag hare and collects all their food chips.
7. How did the cougar do? 2 food chips is alive, 3 healthy, 4 can reproduce, and 5 is fat.
8. If the food pyramid didn't work the first time tell the students that they must arrange themselves so that everyone gets to eat. It may take more then one try.
9. A short debriefing should include the fact that for any one predator there are many prey.

BALANCING ACT

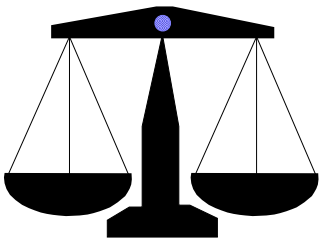
ACTIVITY DESCRIPTION:
In this activity students explore and discuss some of the values stakeholders have regarding use of grassland and forest ecosystems. They should understand that land use issues are diverse and complicated but that both ecosystems are very important to their lifestyle.

TIME REQ'D: 20 minutes LEADER: ASCCA guide

MATERIALS NEEDED:
We provide: Stakeholder sheets

BACKGROUND:
Forest ecosystems have been interacting with grassland ecosystems in Alberta since the glaciers retreated 12,000 years ago. Despite the constant shift on the landscape between ecosystems gaining and losing ground, there is often a temporary balance that is struck when the topography, climate, and biotic components are held constant for a certain amount of time. Human influence on this balance has been significant through industrial development, agriculture, and urbanization having a huge impact on both ecosystems. This activity is designed to inform the students about the different people or things that have an interest in these natural or developed ecosystems. They should understand the natural and human forces acting on forests but also appreciate the importance of both ecosystems to their lifestyle. Many values determine the future of our forest.

DIRECTIONS:
1. Make a boundary for the grassland ecosystem, the forest ecosystem, and a place for both (ie. close to the forest = forest, in the field = grassland, somewhere in between = both).
2. Hand out the different stakeholder sheets to each group and have them brainstorm which ecosystem (grassland, forest, or both) they might rely on most and why. Some are harder than others.
3. Let them read aloud their stakeholder sheet and discuss what ecosystem they need and why. They should also think about and share what other stakeholder(s) they thought might rely on the same ecosystem.
4. They should stand in the designated ecosystem area until everyone has presented their side.
5. Ask them: Which ecosystem should be protected?
   What happens if we protect only one of these ecosystems?
   How would the loss of one of these ecosystems impact you?



OH DEER

ACTIVITY DESCRIPTION:
This activity involves playing "OH Deer", taken from Project WILD. Students learn the components of habitat by playing out scenarios as deer and habitat.

TIME REQ'D: 20 minutes LEADER: ASCCA guide

MATERIALS NEEDED:
We provide: Tracking sheets and soft nerf-like balls.
You provide: Pencils and Activity Sheets

BACKGROUND:
All animals need habitat to survive. Habitat is the specific arrangement of food, water, shelter, and space that an organism requires. Any individual or population needs enough of each component to survive. Many Foothills Parkland species rely on the Aspen forest as part of their habitat, especially for food and shelter.

Populations fluctuate according to the availability of food, other necessities, and disease in an ecosystem. Wildlife officers collect data and monitor populations. The data they collect helps them make decisions when populations change and may be at risk. They must make difficult decisions trying to maintain the balance between human demand, traditional practices, and conservation of the species and the ecosystem for future generations.

DIRECTIONS:
1. Ask the students to name some of the things that all living things need to survive. Summarize the list that they have made by listing the four basic areas: food, water, shelter, and space.
2. Explain that all the things that deer need to survive (food, water, shelter and space). This makes up habitat.
3. Have the students count off in fours. The ones should form one line and the twos, threes and fours should form another line facing the ones. These lines should be about 5-10 meters apart. The ones are the deer and the twos, threes and fours are habitat (food, water, shelter and space). (Have the teacher, or someone else assist by recording the numbers of deer and habitat in each round. These sheets may be used later, back in school, in a graphing exercise.)
4. Explain that you will play a few rounds. In each round, the number ones (deer) need to decide whether they need food, water, shelter or space. The number twos, threes and fours (habitat) also must decide what habitat component they are going to be (food, water,

shelter, or space) for that round.
5. Show the symbols for each habitat component to the students. Food - hands over stomach. Water - hands over mouths. Shelter - hands over head. Space -arms stretched out and open.
6. Emphasize that students cannot change their symbol once the round has begun. They will be able to change their symbol only at the beginning of each round.
7. Have them stand 5-10 meters apart facing each other.
8. Get them to turn away from each other and make their symbol for that round. When you say, "Go!" they turn to face each other.
9. Deer find the habitat that matches their symbol and take them back to their side. This demonstrates to students that when an animal is successful and is able to meet its needs, then it can reproduce. If an animal does not find a habitat to match its needs, it dies and becomes part of the habitat. Habitat waits until a deer takes them and if they are not tagged in that round, they remain habitat.
10. You can introduce a predator, standing between the two groups at the side with a sponge ball. If the predator hits a deer with the ball the deer returns to habitat.
11. After you have played several rounds, gather the students for a discussion. Discussion questions might include:
    - Did anyone find that they were animals more than once?
    - Did the number of animals go up after the first round of the game?
    - What happened when there were more animals than habitat?
    - What things could make habitat endangered?
    - What can we do to make sure that habitat is here in the future for deer?

FOREST VALUES

ACTIVITY DESCRIPTION:
This activity explores how students value forests and provides a basis for wrapping up the day.

TIME REQ'D: 20 minutes LEADER: ASSCA guide

MATERIALS NEEDED:
We provide: Quotes and poem

BACKGROUND:
To appreciate the forest you must make some type of connection to it. Hopefully students have gained some type of appreciation of what a forest is during this short hike.
Forests are valued for many reasons. There is ecological, quality of life, recreational, aesthetic and economic value to a forest. Quality of life values overlap the other categories. Ecological values include the life supporting value of a forest. Ecologically forests also provide habitat for wildlife, maintain soil, moderate climate, and moderate water quantity and quality. Recreational value is wide ranging and forests support many human activities such as hunting, fishing, camping, hiking, skiing, wildlife viewing, and photography.
Economic value from a forest comes primarily from using trees as a resource and commodity. The products and jobs the forestry industry provides constitute a large part of the Canadian economy. Even many service jobs relate back to a bustling forest industry. Recreational

pursuits also provide economic inputs to a community.
Aesthetically forests provide inspiration. They are part of our natural environment and part of our national identity. Some recreational, economic, and even ecological value can be derived from planned forests. These replanted or planned forests provide habitat for some wildlife, but have a reduced biodiversity. They are manmade forests that simply do not have the diversity or complexity of natural forests because we do not have the knowledge to create what has taken years to evolve and grow. These replanted forests also lack nutritional resources due to past logging practices, therefore they do not regrow at they same rate. Replanted forests have mainly an economic value, but do have some recreational and ecological value.

DIRECTIONS:

1. A wrap up can happen inside or outside. Everyone should be comfortable.
2. Start with a quote and/or talk about how and why forests are important to you.
3. Ask the students how and why forests are important to them. Draw from student answers to try and cover economic, ecological, recreational, and aesthetic importance.
4. When discussing the relationship between ecological and economic values, ask students what they can do to reduce the threat to forests. Do they recycle? Do they buy products with minimal packaging like bulk food? Most Canadians don't want to put the forest industry out of work because they provide us with many things we need. It would also be detrimental to our economy.
5. Read a poem or a story about trees.
6. End the day with a sharing circle, tell the students what your favorite part of the day was and have them share their favorite part.

4.0 POST-VISIT ACTIVITIES

4.1 FOREST USERS

Objective

To help students see opposing points of view with regard to forest use issues.

Scenario

The land surrounding Ripple Lake is half privately owned and half publicly owned. Some of this lake shore property is a provincial park. The provincial government is considering a Forest Management Agreement with Loggy Forestry Company on the public lands adjacent to the park. As part of the Forest Management Agreement Loggy Forestry Company must obtain public input during the development of their forest management plans. Management plans must address the needs of all forest users. They have scheduled a public meeting to inform local residents about the proposed agreement and gather public input.

The rural community around Ripple Lake has a small but growing recreational industry. This industry revolves around sports fishing and the provincial park. Local business owners provide lodging, food, equipment and fishing supplies to visitors. Local citizens

are afraid logging would cause water problems in the lake, and clear cutting would be an eyesore. The environmentalists, some naturalists, and some recreational users would like to see the park expanded, the area protected, and logging prohibited. Other residents and business owners think logging and a possible saw mill would boost the local economy.

The logging company wants to ease any environmental concerns by explaining that some sensitive areas, including those close to waterways, will be left uncut. Their position is also that planned cut patterns will increase some wildlife species. They also propose that economic spin-offs from logging will greatly benefit the community.

Procedure

Explain to students that the class is going to role play or undertake a simulation about a forestry related land use issue.

You may want to brief students and/or let them research roles before the meeting, or hold an impromptu meeting. Call the meeting to order.

Forest Users in attendance:

- Cottage owners-Concerned about noise, traffic, pollution, and property values
- Local residents-business owners (restaurant, hotel, retail, and recreational)-Concerned about their present business and future business opportunities
  -unemployed- Interested in possible job opportunities
- Recreational/Park users- Use park facilities, land and water, concerned about noise and water quality
- Naturalists- Enjoy area flora and fauna in park, many of whom fish recreationally and are avid birders
- Ecologists-Study flora and fauna and are concerned logging would negatively effect wildlife populations in the park, a protected area
- Environmentalists- Concerned logging in general is ecologically damaging.
- Native peoples- Concerned about the environmental impact, loss of habitat, and spiritual value of the area.
- Reporters/Media- Attend meeting as a professional duty, interested in any conflicting opinions issues.

4.2 FORESTRY CAREERS

Objective

Students will learn what skills and education are needed to work in various forestry careers.

Procedure

1) Brainstorm with students to create a list of forestry careers. You may refer back to on-site activities for ideas.

2) You can either co-ordinate or assign research to students. Research, from various sources such as libraries, government and professional agencies and associations,

educational requirements of various forestry related careers. Government departments and industry associations that might be helpful include Alberta Forestry Association, Alberta Forest Products Association, Canadian Silviculture Association, Association of University Forestry, the provincial Department of Environmental Protection, and Forestry Canada. Choose a few with different educational backgrounds (e.g., Silviculture or forestry technician, Professional forester, and Production Manager of a Pulp and Paper Mill). Have students make presentations on the career they researched.

3) Invite one or more individuals from a forestry career option to your school. You may ask them to speak to your class about their job and education necessary, or invite them to a school career day. Make sure any invited guest is aware of their audiences' needs (e.g., desired information, attention span, need for a variety of activities and where they fit into your unit of study).

4.3 CLASSROOM PAPER RECYCLING

Objective

Students participate in their own recycling project and see how paper is made and recycled.

Materials

scrap paper (recycling bin)	vegetable scraps, flowers and/or dye
wooden frames	water
fine wire screen	stapler
blender or food processor	tea towels
iron	bucket or large basin

Procedure

1) Tear scrap paper into small pieces. Soak paper in hot water in the blender for approximately 20-30 minutes or until paper is quite soggy.

2) Assemble screen. Staple screening to one of the frames.

3) Blend paper and water mixture thoroughly. This is your pulp. Add any dyes or vegetable matter and mix again.

4) Pour pulp into the large basin and add more water. It should be thin and soupy.

5) You might have to experiment before hand to find the proper consistency.

6) Place the two frames together, screened frame on the bottom with the screen next to the other frame. Holding the frames together, place them in the watery pulp mixture and move the frames gently back and forth until you get an even layer on the screen. You may need to scoop some of the mixture onto the screen.

7) Lift the frames out of the mixture and let the excess water drain off. Keep the frames level. Remove the top frame and turn the screened frame over, onto a tea towel. Press the screen to help remove the paper.

8) Lift the screen away, and place another tea towel on top of the newly formed paper. Use a hot iron to press the new paper, and leave it to dry.

9) The recycled paper can be used to make special occasion cards or other art projects. Experiment with paper types, vegetable scraps, and dyes for varied textures and effects.

4.4 FOREST ENGINEERS

Objective

Students reflect on all the things needed to build a healthy forest.

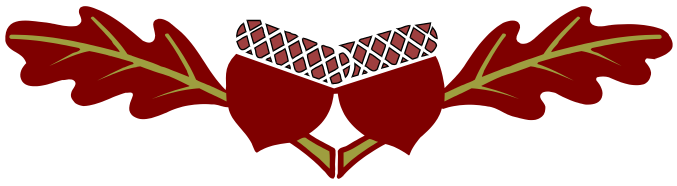
Procedure

Forests are complex ecosystems with an extraordinary number of interactions and interconnections. There are, however, some things any ecosystem needs to function, and some things that make an ecosystem a forest. Listing some of these things helps us understand just what goes on in a forest, and how diverse and complex it is. Listing some of the plants and animals discussed on the hike is a good place to start. A quick run through the natural cycles will help round out your list so that everything needed for a functioning forest is included.

1) Tell students that they have been given a piece of barren land and have been asked to build a forest.

2) Get students to draw and list the things they would like to include in their forest. Have they included everything needed to have a functioning forest (e.g., producers, herbivores, carnivores, decomposers and fungi, soil, water, and shelter)?

3) Have students come together for a sharing circle and share what they think is most important to a forest. Why is this important? Who is it important to?



5.0 OTHER RESOURCES

5.1 FORESTRY RESOURCES

The following is a list of other forestry resources.

Alberta's Focus on Forests: A Resource Guide on Alberta's Forests (Ele. And Jr. High)
Produced by the Alberta Forestry Association.
Write to Focus on Forests
Alberta's Forestry Association
101 10526 Jasper Ave.,
Edmonton, Alberta
T5J 1Z7

Between the Stands, Poster.
Inside Education (formerly FEESA), An Environmental Education Society.
900, 10150-100 St.,
Edmonton, Alberta
T5J 0P6

Guide to the Common Native Tree and Shrubs of Alberta, (key)
by Wanye Inkpen and Rob Van Eyk.
Available through FEESA

Native Trees of Alberta, Poster.
Alberta Environmental Protection,
Available through the Education Section

The Status of Alberta's TIMBER SUPPLY
Pub. No.: T/325, ISBN 0-7732-5026-3
Alberta Environmental Protection,
Available through the Information Centre.

The Forest Explorers (a student booklet)
Canadian Council of Forest Ministers, ISBN 0-9696158-3-3.

Our Common Ground, National Forest Week
Canadian Forestry Association, A Federation of Provincial Forestry Associations
185 Somerset St., S.W.
Suite 203
Ottawa, Ontario,
K2P 0J2

5.2 GLOSSARY

ABIOTIC: A non-living factor in an environment (e.g., light, water, temperature)

ALTERNATE: As with leaves or branches, placed singly at different heights along a stem or trunk.

BLADE: Flat part of a leaf.

BIOME: An ecosystem of a large geographic area in which plants are of one formation and for which climate sets the limits.

BIOTIC: A factor or process which is biological in nature or results from a living organism.

BROADLEAF: A term for a plant with wide bladed leaves, generally refers to flowering plants, in contrast to conifers or grasses.

BROWSE: Evidence on bushy plants that deer, elk, or cattle have fed, on the twigs, leaves, and bark.

CANOPY: The more or less continuous cover of branches and foliage formed collectively by the crowns of adjacent trees.

CARNIVORE: An animal or meat eater.

CARRION: The bodies of dead animals usually in a state of decay.

CLONE: Asexually produced offspring of a common ancestor (i.e. Aspen).

COMMUNITY: A group of different organisms which all rely on the same physical habitat to meet their needs.

COMPETITION: An interaction between two species in which both require the same limited resource. Interspecific competition occurs between two different species. Intraspecific competition occurs between two individuals of the same species.

COMPOUND: Referring to leaves made up of several leaflets.

CONIFER: A plant that bears its seed in cones; usually refers to needle leafed trees. Conifers are often referred to as softwood trees.

CONSERVATION: The protection of natural resources.

CONSUMER: Herbivores and carnivores that consume energy and transform it into biomass. A Primary Consumer is an organism that eats plants (e.g.,

squirrel). A Secondary Consumer is an organism that eats animals that eat plants (e.g., weasel). A Tertiary Consumer is an organism that eats animals which eats secondary consumers (e.g., hawk).

CREPUSCULAR: Active at dawn and dusk.

DECIDUOUS: Falling off at maturity; usually refers to trees which drop their leaves each year. Deciduous trees are often called hardwood trees. May also refer to antlers which are lost.

DECOMPOSER: Organisms that convert dead organic material into inorganic materials.

DIURNAL: Active during the day.

ECOSYSTEM: All living things and their environment in an area linked together by energy and nutrient flow.

FOOD PYRAMID: A representation of the flow of energy through consumer levels.

FOREST MANAGEMENT AGREEMENT (FMA):
An agreement between the Alberta government and a company that enables the company to enter public forest land for the purpose of establishing, growing and harvesting timber in a manner designed to provide a perpetual sustained yield.

GRASSLAND: A vegetative community in which grasses are the most conspicuous members.

HABITAT: The arrangement of food, water, shelter and space suitable to an animal's needs.

HARDWOOD: See DECIDUOUS.

HERBIVORE: A plant eater.

INSECTIVORE: An insect eater.

INTERACTION: The relationship of one organism to another.

LIFE CYCLE: The continuous sequence of changes undergone by an organism in changing from one form to another in its lifetime.

LOBED: A particular shape, usually of leaves where the blade id prominently indented.

MARGIN: Edge of the leaf blade, described as smooth, wavy, or serrated (i.e., toothed).

MICRO-ORGANISMS: Microscopic one- or multi-celled organisms such as bacteria, fungi, and algae.

NOCTURNAL:	Active at night.
NODE:	The place on the stem where the leaf originates.
OMNIVORE:	An animal which eats both plants and animals.
OPPOSITE:	Referring to leaves and branches, where 2 leaves or branches originate at the same point on opposite sides of the stem or trunk.
PETIOLE:	Leaf stem: attaches to node and base of leaf.
PREDATOR:	An animal that kills and eats other animals.
PREY:	Animals that are killed and eaten by other animals.
PRIMARY PRODUCER	Green plants which are able to make their own food from simple organic substances.
SCAVENGER:	An organism that feeds on refuse or carrion (e.g., coyote, beetle).
SILVICULTURE:	The theory and practice of controlling the establishment, composition, growth and quality of forest stands to achieve the objectives of management.
SNAG:	A dead, but standing tree from which the leaves and most of the branches have fallen.
SOFTWOODS:	See CONIFERS.
UNDERSTORY:	The lower level of vegetation in a forest. Usually formed by ground vegetation (e.g., mosses, herbs, fungi, and lichens), and shrubs, but may also include subdominant trees.
WEB OF LIFE:	The concept that every living thing interrelates with others so if we alter one organism we alter all others. (See FOOD WEB).
WHORL:	Three or more leaves, leaflets, or branches, originating from the same node or level on the trunk.
WILDLIFE:	Animals which are not domestic or tamed.

5.3 SPONSORS

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