

PARKS AND PROTECTED AREAS

Where Forest Meets Prairie



Alberta
COMMUNITY DEVELOPMENT

Kananaskis Country

This publication is part of a series of field study programs produced by the Environmental Education Program of Parks and Protected Areas in Kananaskis Country and Fish Creek Provincial Park. These publications have been written to address the goals of Alberta Community Development and increase students' environmental awareness, understanding, interaction, and responsibility for the natural world in which they live.

The publications are developed in a close working relationship with teachers, community educators and program writers. Programs focus on the areas of environmental education, science, social studies, and language arts. They are also developed to emphasize elements of environmental literacy, lifestyle, and citizenship.

This material may be freely copied for educational use provided the source is acknowledged.

For more information contact:

Environmental Education Specialist
Parks and Protected Areas - Kananaskis Country
Suite 201, 800 Railway Avenue
Canmore, AB. T1W 1P1

Telephone: (403) 678-5508 (toll-free within Alberta 310-0000)
Internet: www.cd.gov.ab.ca/parks/kananaskis

Where Forest Meets Prairie

ISBN: 0-7785-0882-X Pub. No.:I/782 (printed edition)
ISBN: 0-7785-0883-8 Pub. No.:I/782 (on-line edition)

Copyright © 2002 Government of Alberta



TABLE OF CONTENTS

1.0	Overview	1
	1.1 At a Glance	1
	1.2 Program Summary	3
	1.3 Program Objectives	4
	1.4 Curriculum Tie-Ins	4
2.0	Pre-Field Study	5
	2.1 Activity: Adapt - A - Human	
3.0	Field Study: Where Forest Meets Prairie	
10	(The Montane Trail at Bow Valley Provincial Park)	
4.0	Suggested Extension Activities	13
5.0	Where Forest Meets Prairie: Program Evaluation	14
	Appendices	
	I Student's Notebook	
	I Volunteer's Notebook	

1.0 OVERVIEW

1.1 AT A GLANCE

TOPIC

Communities and Adaptations

PROGRAM LEVEL

Focus on Division II

TIME REQUIRED

Pre - Field Study: two 40 minute class periods
Field study prep.: 2 hours
Field study: half a day
Post - Field Study: three 40 minute class periods

STAFF REQUIRED

1 instructor, plus volunteers
(an adult: student ratio of 1:8 is recommended)

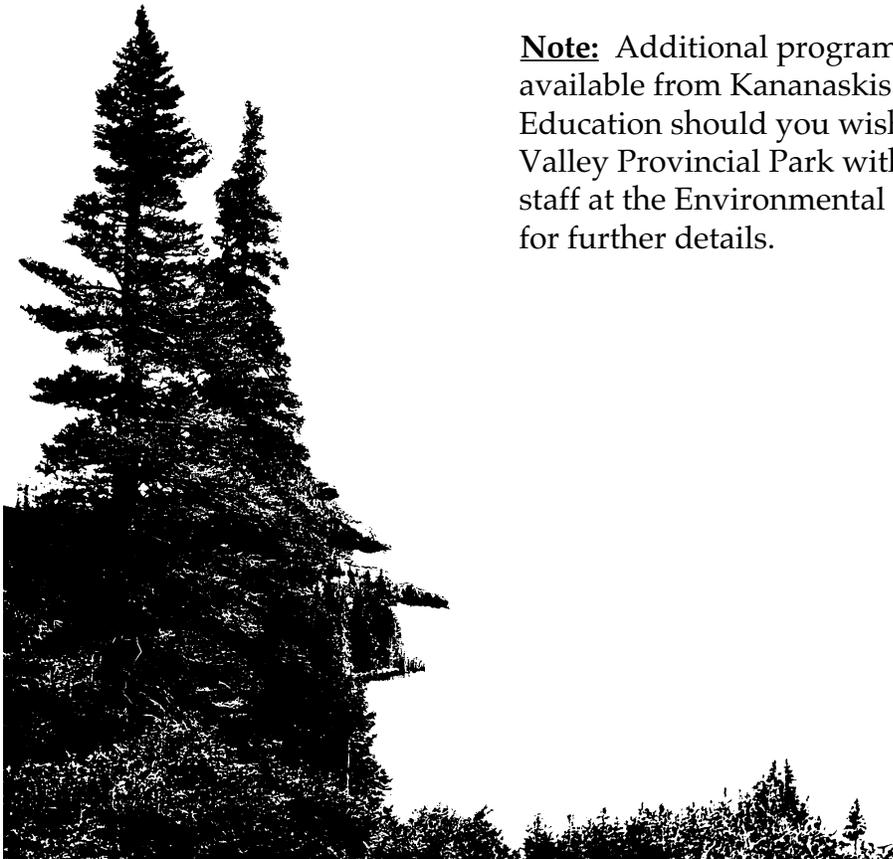
BEST SEASON

late spring, summer, or early fall

SUGGESTED LOCATIONS

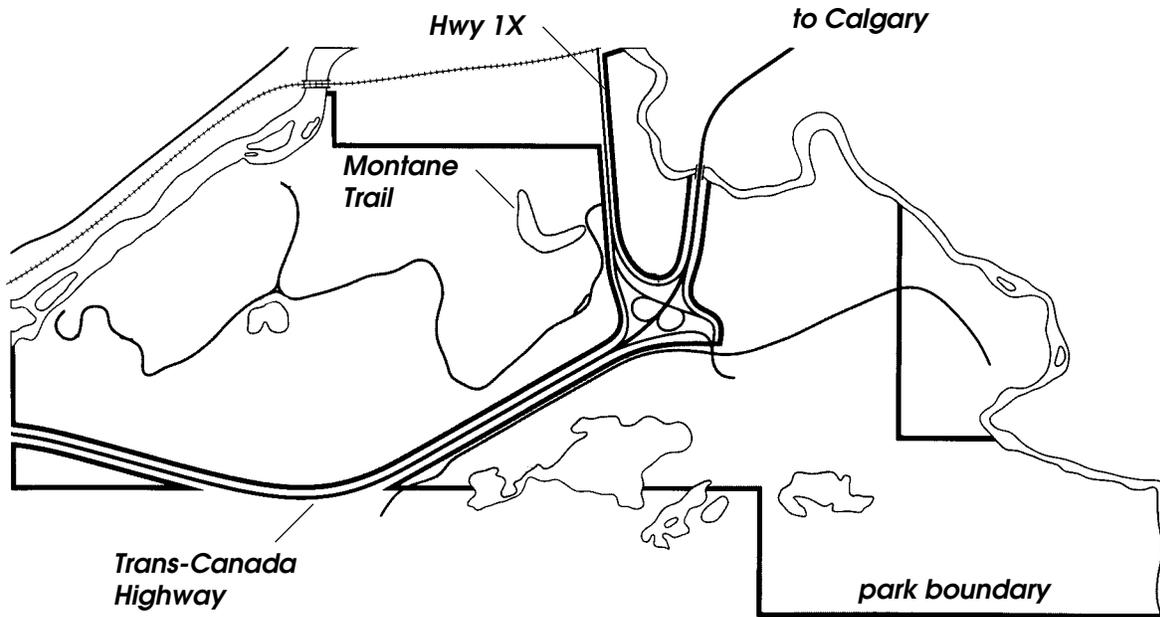
The Montane Trail, Bow Valley Provincial Park. The trailhead is located at the Visitor's Centre. A map showing how to get to Bow Valley Provincial Park is shown on the following page.

Note: Additional programs and activities are available from Kananaskis Country Environmental Education should you wish to spend a full day at Bow Valley Provincial Park with your class. Please contact staff at the Environmental Education office (678-5508) for further details.

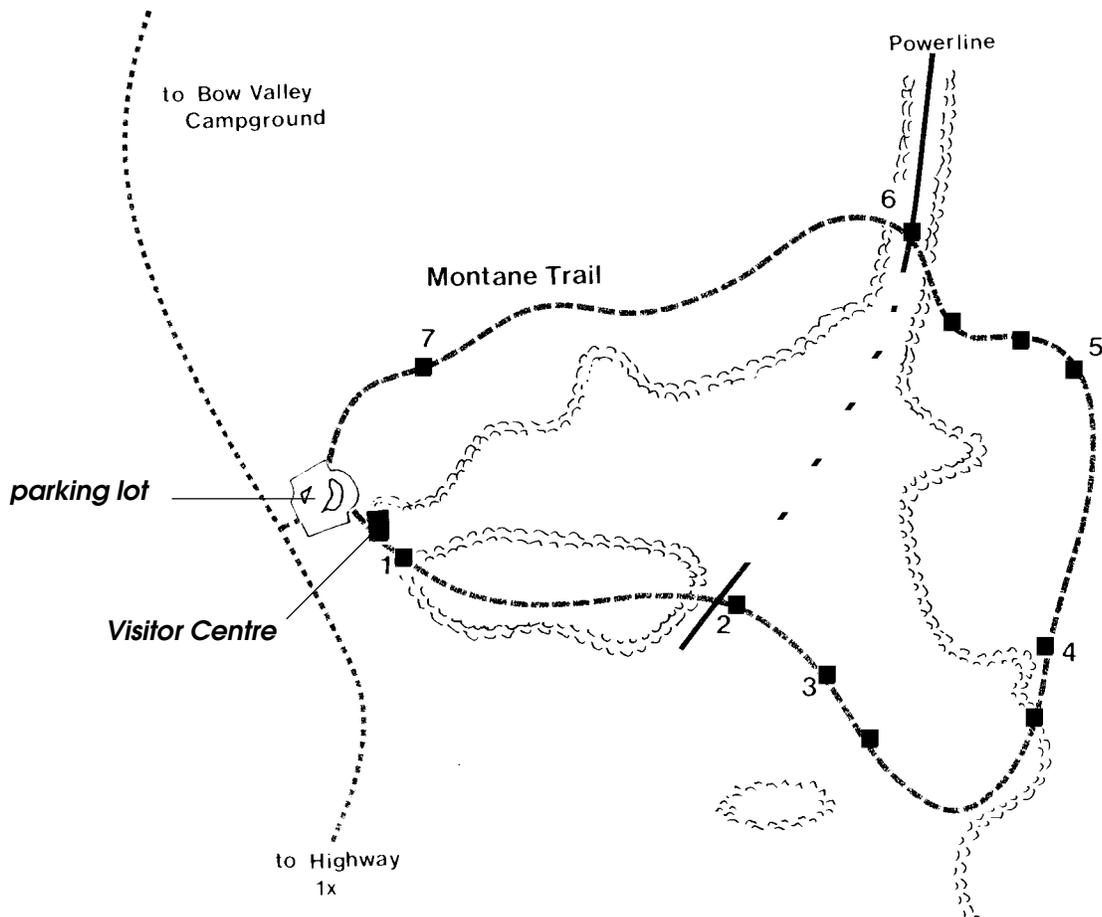


Bow Valley Provincial Park

To get to Bow Valley Provincial Park: travel west about 80 km from Calgary on the Trans-Canada highway. Take the first exit to the north after you cross the Kananaskis River.



The Montane Trail, Bow Valley Provincial Park.
The trailhead is located at the Visitor's Centre.



1.2 PROGRAM SUMMARY

The program *Where Forest Meets Prairie* focuses on the topics of communities, environmental factors, and adaptations. A community is a place where an assemblage of plants and animals live and meet their needs. The program explores an area where forest communities and grassland communities lie adjacent to one another in a patchwork or *mosaic* pattern. Environmental factors such as moisture, light, and temperature are investigated, along with adaptations, characteristics that help plants and animals to survive in their environment.

Where Forest Meets Prairie is an activity-based examination of these topics. The program is divided into three sections: a pre-field study activity (conducted in the classroom) called *Adapt - A - Human*; a field study at the Montane Trail in Bow Valley Provincial Park where students conduct their own investigations; and in-class post-field activities.

This program is part of a unit written for Division II on natural ecosystems. Each program can be used separately or as a unit of study. The complete unit includes:

Where Forest Meets Prairie - a field study to Bow Valley Provincial Park's Montane Trail where students investigate the Montane ecosystem.

Forest, Field, and Pond - A Study of Ecosystems - a field study where students investigate food chains, food webs, and interrelationships that exist in three different communities.

It's the Limit - deals with the concept of limiting factors.

1.3 PROGRAM OBJECTIVES

Students will:

- investigate different aspects of a natural community
- demonstrate an understanding of the concept of adaptation
- be able to predict how an organism might adapt to changes in environmental factors
- be able to draw a comparison between human and natural communities
- be able to characterize a forest or a prairie community by describing the plants and animals that live there

1.4 CURRICULUM TIE-INS

These materials can be used to assist in fulfilling curriculum requirements in the following subject areas of the curriculum:

Subject	Topic Area - Curriculum Tie-In
Science (Division II)	Topic II: Living Things and the Environment A. Environmental factors - organisms live where conditions are suited to their needs B. Adaptations - organisms make structural and behavioural adaptations to survive C. Ecosystem - living and non-living things interact in an ecosystem
Language Arts	• reading, listening, using descriptive language, poetry, story-writing
Math	• Addition, division, calculating averages

2.0 PRE-FIELD STUDY

2.1 ACTIVITY: ADAPT - A - HUMAN

Central to the concept of adaptation is the change that occurs in an organism that allow it to survive better in its environment. In this activity, students look at how the human form might adapt to different conditions and environments - such as living in the hair on a dog's back.

Objectives

Student shall...

- demonstrate an understanding of what adaptation is.
- appreciate how different environmental factors encourage an organism to adapt

Curriculum Tie-in

Science:

- structural and behavioural adaptations

Time Required

two class periods of 40-60 minutes each

Materials

- chalkboard
- Home Cards (included in this section)
- large pieces of paper (can be recycled or reused paper) - one per group
- a variety of crayons or coloured pencils

Instructions for the Teacher

1. Divide the class into groups of two or three students per group. Give each group a piece of plain white paper and crayons or magic markers in a variety of colours.
2. Ask the students:
If you lived in a different place and could change your body so that you were better suited to the environment, what would you look like? As an example:

"If I lived at the North Pole I might change my feet so they looked like cross-country skis. My arms might be very long so I could use them for ski poles. I probably would grow long, warm hair to help keep me warm. My hair would probably be white to blend with the snow so that polar bears would have trouble seeing me."

As you give this example, you may wish to draw what this new life form would look like on the chalkboard.

3. Explain that you are going to give each student group a card. On the card will be printed a place where the group must invent a human form that could live there. (for example, the card for the previous exercise might have said "Your new home is at the North Pole").



Each group will keep their place a secret from the other groups, and make a drawing of their new form. Suggest that the drawing first be made in pencil and then retraced with crayons or markers.

4. Distribute the Home Cards. To make these cards you can glue the page to a stiff card, and then cut along the dotted line. Alternatively, you may wish to simply laminate the page before cutting.
5. Allow 15-20 minutes for drawing and discussion. You may choose to have groups label the special features of their human and perhaps give their human a name.

After the groups have completed their drawings, each group can then show their drawings to the rest of the class, with one member of each group describing the special features of the organisms they have drawn. The class can then be given five guesses to determine where this life form is adapted to live.

6. If the class' guesses are incorrect, the group responsible for the drawing then gives their living place and explain why they drew the life form the way they did. You may wish to discuss each drawing, allowing the class to make comments on the structures shown in the drawings.
7. Ask the class if there are real plants and animals that live in the places on their cards. Discuss some of these living things. What shapes do they have; what allows them to survive where they do?
8. Tell the students that you have been talking about *adaptations*. Ask the students to give you a definition of the word *adapt*, and ask them to use it in a sentence.

Note to the teacher: The word **adapt** can be used in two different ways.

1. **Adapt** can be used as follows: "Over the centuries, the human species adapted to life in the grasslands by standing erect and by perfecting binocular vision (i.e., looking with both eyes at the same thing)". This use of the word **adapt** implies a long-term change that occurs over the course of many centuries and many generations and alters the genetic make-up of an organism.
2. Another use of the word **adapt** is as follows: "When the teacher turns on the overhead lights after watching a movie, the students' eyes take only a few seconds to adapt to the light." This is a short-term adaptation, one that can occur over the course of a few seconds or a few years, and does not involve the genetic make-up of a species

In summary, adaptation is an adjustment to a new situation or environment and can occur over both short and long periods of time. Long-term adaptation is also known as evolution.

9. Adaptations can be structural or behavioural. Read the introductory example of adaptation ("If I lived on the North Pole") again, and ask them if these are structural or behavioural adaptations. Once students realise these are all structural adaptations, ask them to give a behavioural adaptation. Examples might include "I dig holes in snow drifts to sleep in", or "I only go out on warm days".

Ask the students to examine the adaptations that their humans underwent in **Adapt - A - human**, and have the students divide them into two categories: structural and behavioural adaptations. You may then suggest additional behavioural adaptations.

Some examples of behavioural adaptations include the following:

- plants grow towards the light
- wolves hunt in packs
- hawks soar high above the ground so that they can use their excellent eyesight

Other examples of structural adaptations include the following:

- most animals that live under rocks are flat
- owls that hunt at night are able to see well in the dark
- whales use special sound detectors or sonar to locate food
- some trees have very deep roots (tap roots) to help them get water deep in the ground
- flowers often have bright colours to attract insects
- humans have thumbs that allow us to grasp things.

Ask the class for other examples of adaptations in plants and animals that they are familiar with, and ask the students to characterize them as behavioural or structural.

10. After the examples have been given, ask what would happen to a plant or animal that was suddenly put into some environment they were not normally found in: e.g. a polar bear in the tropics, or a monkey in the Arctic. The class will realize that these animals are adapted for life in their own habitat, but not in others. Ask students what would happen if a human were to be moved from the arctic to the tropics, like the polar bear. Students should then realize that humans are possibly the most adaptable of all of the animals in the world, because of the variety of behavioural adaptations that they demonstrate.

Humans display a diversity of structural and behavioural adaptations. Ask your students to separate the following adaptations into either behavioural or structural, and explain why:

- people living in hot countries take a siesta in the afternoon
(behavioural - they can save their energy for doing work when it is cooler)
- Inuit people generally have short, stocky bodies
(structural - decreasing the ratio of surface area to volume has the effect of decreasing heat loss)
- people living at high elevations have more red blood cells
(structural - they need more because the air contains less oxygen at high elevations)
- Natives in Brazil frequently use boats to move through the marshy jungle
(behavioural - they would otherwise have great difficulty in travelling through the dense jungle)
- People who live in countries where the sun is hot have black skin
(structural - the pigment helps to protect the skin from the sun's rays)
- The Zulu people of Africa are tall and slender
(structural - this shape allows body heat to dissipate easily)
- The Woodland Cree in Northern Alberta make snowshoes so that they can move through the woods easily
(behavioural - ease of motion)

**YOUR NEW HOME IS...
ON A TREE LIMB**

**YOUR NEW HOME IS...
IN A FLOWER**

**YOUR NEW HOME IS...
IN A ROTTING LOG**

**YOUR NEW HOME IS...
IN A FLOWER POT**

**YOUR NEW HOME IS...
UNDER A ROCK**

**YOUR NEW HOME IS...
ON THE BACK OF A DOG**

**YOUR NEW HOME IS...
IN A FOREST**

**YOUR NEW HOME IS...
IN AN ASH TRAY**

**YOUR NEW HOME IS...
IN A POND**

**YOUR NEW HOME IS...
IN A FIELD OF GRASS**

**YOUR NEW HOME IS...
IN A FLOWER**

**YOUR NEW HOME IS...
ON A HOCKEY PUCK**

**YOUR NEW HOME IS...
ON TOP OF A MOUNTAIN**

**YOUR NEW HOME IS...
ON A CAR WHEEL**

**YOUR NEW HOME IS...
ON TOP OF THE
TEACHER'S HEAD**

**YOUR NEW HOME IS...
UNDER THE BARK OF A
PINE TREE**

**YOUR NEW HOME IS...
IN A CRACK IN THE SIDEWALK**

3.0 FIELD STUDY: WHERE FOREST MEETS PRAIRIE

There is no substitute for immediate, hands-on experiences. This half-day field study takes place at the Montane Trail at Bow Valley Provincial Park. Students receive a "Student's Notebook" that guides them through a number of field activities. By investigating the Montane Trail, students will learn about the characteristics of a forest and a prairie, and examine the adaptations of the organisms that live there.

Objective

Student shall gain first-hand experience of:

- examples of how environmental factors cause plants to adapt
- a forest and a prairie community

Curriculum Tie-ins

Language Arts: reading, listening, using descriptive language, poetry

Math: Addition, division, calculating averages

Science (Division II) - Topic II: Living Things and the Environment:

- A Environmental factors - organisms live where conditions are suited to their needs
- B Adaptations - organisms make structural and behavioural adaptations to survive
- C Ecosystem - living and non-living things interact in an ecosystem

Time Required

preparation time: 1-2 hours

field study: half day

Materials

Divide the class into pairs. **Each group of two** will need the following equipment for the field study. Have the materials made, collected, and stored several days **before** the field study.

- 1 shoe box or similar container to hold the field study materials
- 1 four metre string ruler; make in class (see Preparations, below)
- 1 pencil with eraser for each person
- 2 clipboards (borrowed or handmade)
- 1-2 magnifying lens (if available)
- 2 magnifying boxes (if the students know how to use Pooters, these would be useful)
- two copies of *Student's Notebook* (one for each student)

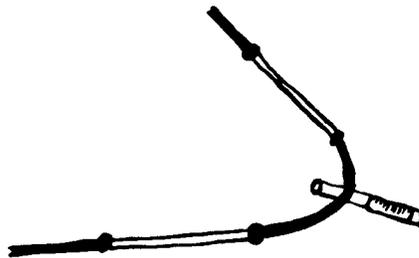
The teacher will need:

- whistle
- extra pencils
- extra sheets and student booklets
- extra magnifying lenses or hand lenses
- copies of *Volunteer's Notebook* for all volunteers (remember a copy for yourself)

Preparation

- **How to make a 4 metre string ruler:** The string ruler will be used to mark off an area to explore on the field study. Demonstrate its construction, and allow the groups to follow along.

Give each group approximately 5 meters of string to start off with. Tie a knot at one end of the string. Measure 1 meter and tie the next knot. Continue until you have four 1-meter sections. Cut off the excess string. Next, use a dark felt pen to colour every other 1-meter section. Do this by drawing the string across the pen. Practice using the string ruler. Measure the room, a set of windows, or the blackboard.



- Photocopy the *Student's Notebook* for each student. Hand these out and read through the activities with the class. They should understand the directions for each stop.

Prepare for the field study by doing the following:

- ask students to dress properly (long pants, shoes, socks). Students will be on hands and knees at times so encourage them to wear old clothes. They should also bring rain wear, lunch, and a drink.
- Obtain necessary permission slips and enlist the aid of parent volunteers for the trip. A ratio of 1:8 is recommended. You may wish to send an information letter home to them, including some of the above information.

- Make certain the class knows when the bus will leave and return to school.
- Groups of two are to work as partners and help each other during the field study. Where possible, match good readers with poorer readers to allow each pair some independence from adults during the field study.
- Preview the Montane Trail before your trip. Bring a copy of the *Volunteer's Booklet* and try to do as many of the activities as possible, so as not to be caught off guard during the field study.
- If you wish, a fifteen minute video entitled *Bow Valley Mosaic* may be borrowed from the Environmental Education department of Kananaskis Country (tel: 678-5508) that will offer you and your class an excellent introduction to the area. (Note: even if you view the video, a trip to the area is still highly recommended)
- A briefing for the volunteers can be given just before the field study or during the trip on the bus. To aid you, ask the volunteers to read the section entitled "Just before You Begin..." in their *Volunteer's Booklet*. Remind them that they are there to uphold behaviour expectations, to help with reading at each stop, and to help students arrive at their own answers. Remind them to try to avoid simply providing students with an answer; rather, encourage the students to think for themselves.
- Have a pre-arranged whistle signal to draw students together.

Remind your class that they are in a Provincial Park:

- Emphasize to them that they are visitors to the area and should act as responsible guests in someone else's home. Explain to the students that this is home to many different plants and animals, and that it is their job to leave the park just as they found it.
- encourage students to smell, look, listen and touch, as long as nothing is disturbed in the park
- ask them to please stay on the trail where possible, and ask an adult for permission before going off the trail.
- Park the bus at the Bow Valley Visitor's Centre. The trail begins just behind the centre
- Restrooms are available inside the Visitor's Centre. If time permits, you may wish to view some of the exhibits with your class; drop in during your orientation visit to the site.

To avoid overcrowding in one area, and depending on your adult - student ratio, you may wish to begin groups at different stops along the trail. Because of the way the Student Notebook is constructed, it is not recommended that you go around the trail in the opposite direction to that indicated (i.e., students should proceed around the trail in a counter-clockwise manner).

5. Discussion of the students' investigations can be done back in the classroom. See Extension Activities.

4.0 POST FIELD STUDY ACTIVITIES

- **Review of Answers**
Go through the Field Study booklet and discuss the students' answers for the different trail stops.
- **Class Mural**
Make a class mural (or mosaic!) about *The Montane Mosaic*. A mural is a wall painting composed of many parts. Each small picture in the mural helps to tell the large story. Brown construction paper can be used as the background. The finished mural can be placed either on the floor or the wall. Students may redraw some of their pictures from the field study making them larger and blending them with the other pictures on the mural. Emphasis can be placed on making the mural resemble the forest and prairie communities seen on the field study.
- **Bulletin Board**
Make a bulletin board, having the students cut out letters for a title. The theme of the board could be one of the following:
 - Students' Haiku
 - Students' poems about the view from the hill
 - Students' stories about the Fallen Giant
- **Diversity**
On the chalkboard record the number of different kinds of trees and plants that were counted at "A Meeting Place" and "Summer Meadows". Have the students determine the average number of trees at each stop.

Discuss the results in terms of variety of living things in a forest and a prairie community. The key concept here is diversity, which can be defined as *the variety of a species found in a natural community* (i.e. a field of corn has less diversity of plant species than a natural meadow).

Decide as a class which community is more diverse: the forest site or the prairie site?

- **Differences and Similarities**
Divide the class into groups of 4 students per group. Each group can be made up of two sets of field study groups. Each group of students should use all of the information they gathered on the field study: poems and Haiku; drawings of trees and cones; short stories. Have the students list and describe the differences and similarities between the forest and the prairie.

Each group can present their version of the differences and similarities between the forest and the prairie. Discuss each presentation.

5.0 WHERE FOREST MEETS PRAIRIE - Program Evaluation

Kananaskis Country Environmental Education materials have been developed to provide you with teacher-directed units of study. These are *living documents* that undergo changes on a continual basis.

The purpose of this questionnaire is to find out if these materials are meeting your teaching needs. Your comments are valuable to us. Please take a few minutes to complete this evaluation so that we may continue to improve your materials.

School name	Grade level taught	Your name <small>(optional)</small>
_____	_____	_____

★ How did you hear about the program?
 workshop administration in-service newsletter fellow teacher
 other (please specify) _____

★ Did you use all of the program? yes no
 If you answered **no**, which part did you **not** use and why?

★ On the bar line below how would you rate the program in the following categories:

	YES		NO
• appropriate for grade level (✓)		_____	
• clear instructions		_____	
• text easy to follow		_____	
• relevant to curriculum		_____	
• materials easy to use		_____	
• did you enjoy the material?		_____	
• did your students like the material?		_____	
• program of appropriate length		_____	

- ★ Approximately how long did it take you to complete these materials?
 1-2 weeks 3-4 weeks 5-6 weeks longer than one month
 program was spread over the year

- ★ Were you satisfied with how these materials fulfilled the curriculum objectives?
 yes no
If you **were not** satisfied, please elaborate:

- ★ Did you require any additional information to complete any part of the program?
 yes no
If **yes** please tell us what was required:

- ★ Would you use these materials next year?
 yes no
If you answered **no** please tell us why:

- ★ Any additional comments about the program in general?

Thank you for completing this questionnaire. Please place the completed questionnaire in an envelope and mail to:

**Environmental Education Coordinator
Alberta Environment, Natural Resources Service
Kananaskis Country
Suite 201, 800 Railway Avenue
Canmore, Alberta,
T1W 1P1
Phone: 403-678-5508**

My Haiku

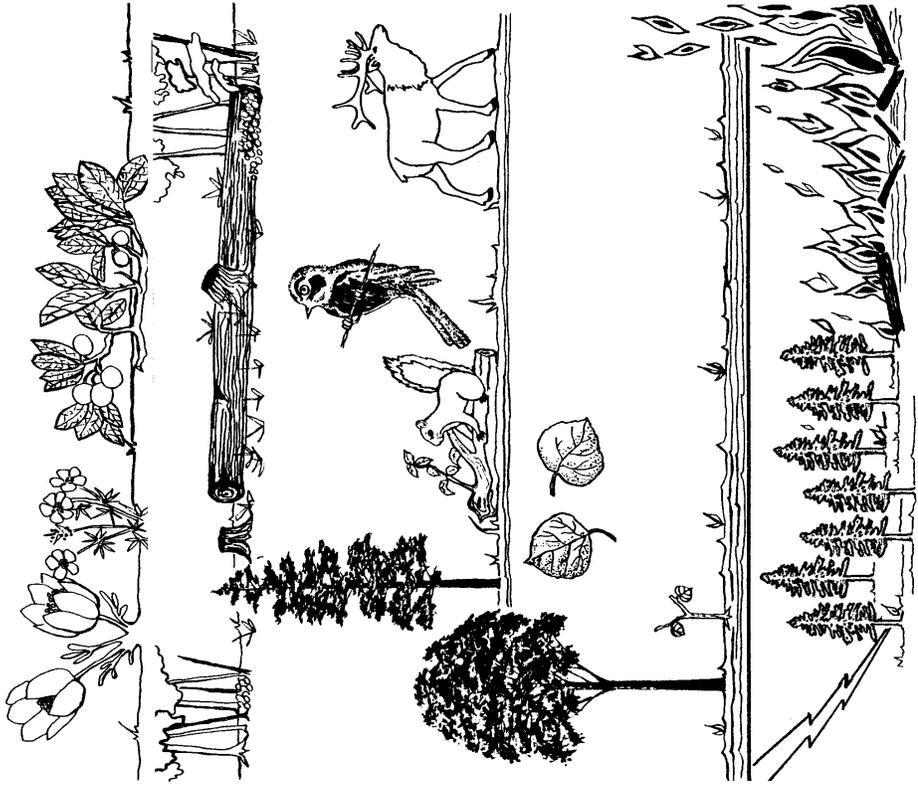
When you finish, wait for an adult to lead you to the visitor centre area. Please stay out of the parking lot; it can be dangerous.

We hope you had a good day!!

WHERE FOREST MEETS PRAIRIE

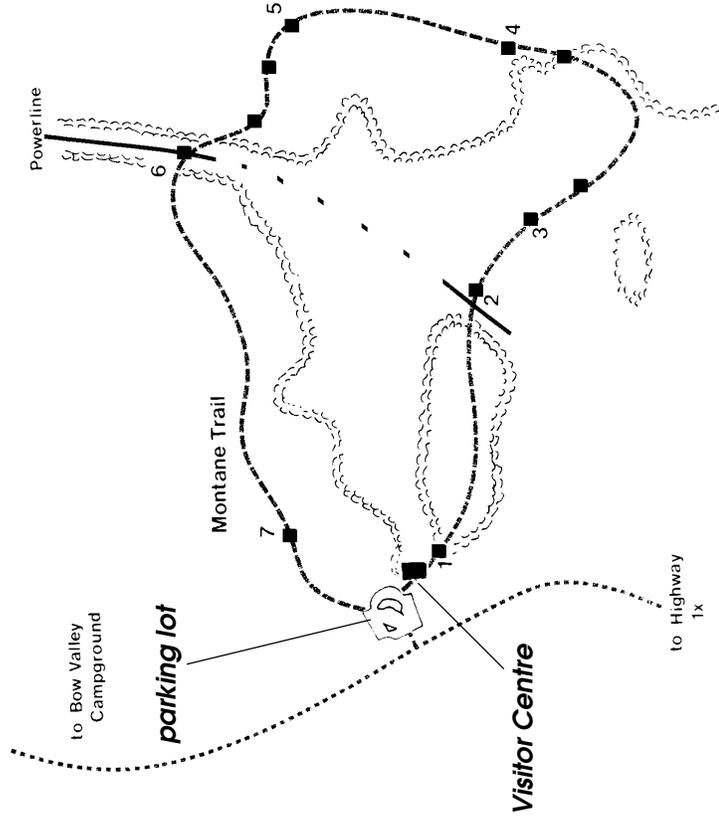
Student's Notebook

THE MONTANE TRAIL AT BOW VALLEY
PROVINCIAL PARK



Name: _____

Montane Trail



Find a comfortable spot near the trail and listen for forest sounds. Write a Haiku poem about the sound you hear.

The art of Haiku is to put into words the quick feeling you get when you focus your senses on something.

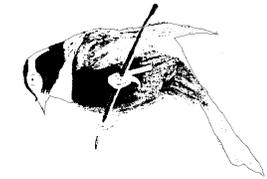
Haiku poems do not have to rhyme.
Haiku poems have only three lines.
Each line has a certain number of syllables:

- Line one has 5 syllables.
- Line two has 7 syllables.
- Line three has 5 syllables.

Here is an example of a Haiku about a sound:

Whistle of a bird (5 syllables)
Passing over the forest (7 syllables)
It touches my heart (5 syllables)

Now write your own Haiku. Use the space on the next page.



#7 LOOK AND LISTEN

If you listen carefully, you may hear the chatter of a squirrel or the twittering call of a mountain Chickadee. If you look closely, you may see elk droppings, or a trail made by animals through the forest.

Look in the forest around the sign. Can you see any piles of chewed pieces of cone left by a Red Squirrel?

yes no

Whenever you travel in Bow Valley Provincial Park, you are in the Montane forest, the place where mountain and prairie life mix.



#1 A MEETING PLACE

Montane is not another word for mountain, but means something else. The Montane is the name we give to the area where the forests meet the prairies. As we walk around this area, we will see grasses that remind us of the prairies. We can also see trees that remind us of the forest.

The place where prairie and forests meet is called the _____

Count the number of different kinds of trees in the small patch of forest. Use the shape of the leaves to tell you if the trees are the same as each other or different from each other.

There are _____ different kinds of trees.

These trees live together as part of a forest community. A community is a place where plants

and animals live and meet their needs. Name an animal that might live in this forest community.

What is a community?

Walk 20 giant steps along this trail. Here you can see a grassy field that looks like the prairies. Plants and animals that live in these grassy areas can also be found living near Calgary. The flat area that stretches for miles all around Calgary is called the Prairies.

Touch the ground between the grasses with your hand. You are touching the grassland community. The forest community and the grassland community occur in patches in the Montane.

Now go down the trail to the next stop.

Describe one adaptation that you think the insect has.

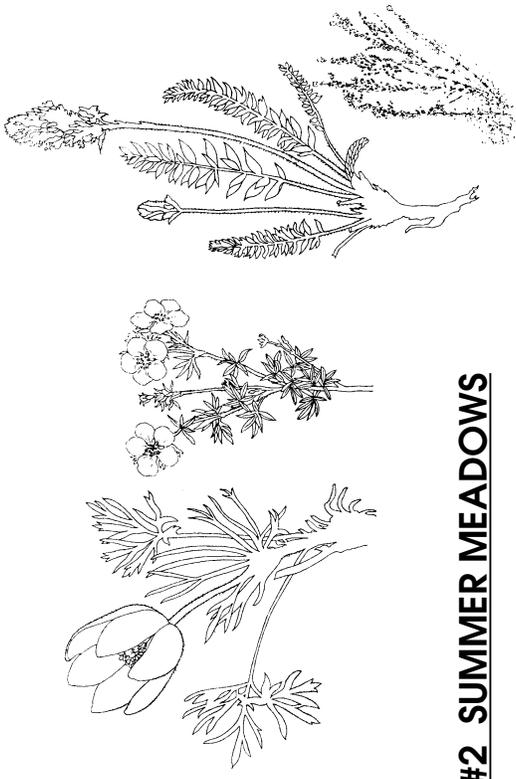
Is this a structural or behavioural adaptation? Explain why.

When you finish, move on to the next stop. If you walk quietly, along the way you may see some animals that live in the Montane forest.

STOP #6

At this stop, you will use the magnifying boxes and pooters that you brought with you to observe any insect that lives in this grass.

1. Use the Pooter to catch an insect in the grassy area.
2. Release the insect into the magnifying box.
3. Observe the insect. In the space below, make a drawing of the insect, including as many details as you can. Fill the whole space with your drawing.



#2 SUMMER MEADOWS

The summer sun and the dry winds that blow all year long are two important things that keep this patch of prairie looking like it does.

This meadow and Alberta's prairies are alike.
What two things help to make them alike?

The plants growing here have developed *adaptations* that allow them to survive both hot summer sun and drying winds. An adaptation is something that plants and animals have that allow them to survive better.

What does "Adaptation" mean? _____

If you look carefully, you can see very fine, silvery hairs on the leaves of some plants. Get down on your hands and knees so that you can look closely at the plants, and use your magnifying lens. These small hairs help protect the leaf surface from the sun's heat and the drying effect of the wind.

As you look over the meadow, what do you see more of: plants growing low to the ground or plants that grow tall?

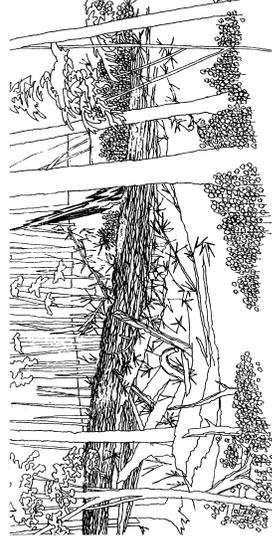
more tall plants more low plants

There are more low plants here. By growing low to the ground, plants can avoid much of the hot dry wind!

What structural adaptations do Douglas fir trees have that protect them from fires?

Now move to the next stop. On the way to the next stop you will pass two signs whose pictures are shown below. Read these with your classmates if you like.

Stop #6 is a special stop that is NOT marked by a sign. It is located at the grassy area beneath the power line. Stop here and read the instructions for this stop.



FALLEN GIANT



ANOTHER TREE, ANOTHER FOREST

my drawing of a Douglas Fir cone

Douglas firs are well adapted to life in the Montane forest. Their thick bark protects the trees from fire. Their roots penetrate deep underground to give support against strong winds. Their root systems are wide-spreading to obtain water. Douglas Firs may live for 1,000 years.

How does a wide, spreading root system help trees?

How does a deep root system help the trees?

Try this experiment: feel how much air is blowing against your face when you are standing on your tip toes. Now lie down on the ground so that your chin is touching the ground. Which feels windier?

It feels windier when I'm on my tiptoes

It feels windier when my chin is touching the ground

If you were a plant and you didn't like the wind because it dried you out, would you prefer to grow close to the ground or high above the ground?

close to the ground

high above the ground

Why have many of the meadow plants developed the adaptation of growing close to the ground?

Use your 4-meter ruler string and make a 1-meter square on the ground. List the number of *different kinds* of plants in this 1-meter square area. Remember to use lots of good describing words! Two of the plants have been listed for you.

description of the plant I found

- 1 long, spiky grass
- 2 short damp moss
- 3
- 4
- 5
- 6
- 7
- 8

Our group found ___ different kinds of plants.

Remember, a community is a place where animals and plants live and meet their needs. Is this a community that you are studying?

yes no

Move down the path to the next stop.



#5 MONTANE GIANT

The tree to the left of the sign is a Douglas Fir. According to Indian legend, tiny mice hide in the cones of Douglas firs. Find a Douglas fir cone. The picture above will help you to identify the right cone.

The Indian legend says that mice are hiding in the cone. Use your magnifying lens and your imagination: can you see their feet and tails?

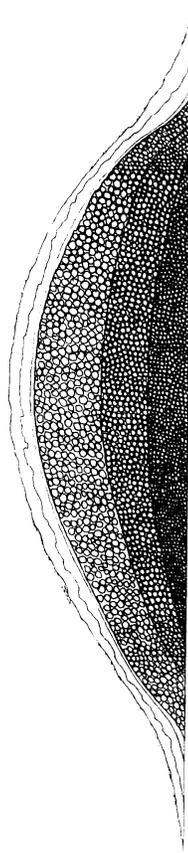
yes no

Make a large drawing of a Douglas fir cone in the space provided on the next page. Fill the whole space with your drawing.

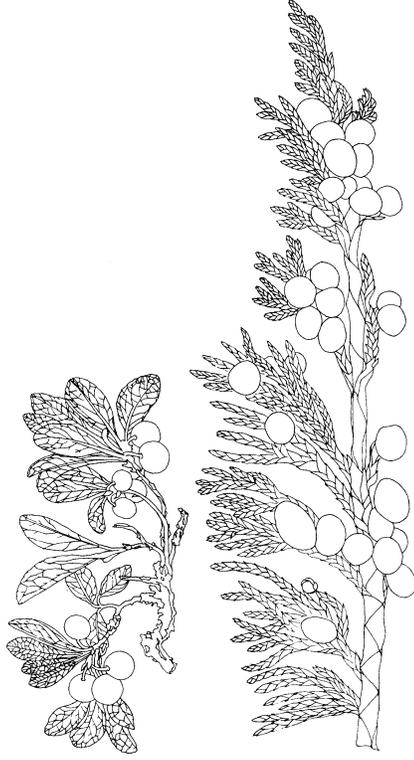
allowing moisture to be used by the plants.

On the west side of this hill, two things have made it difficult for the trees to grow. What are these two things?

Draw some of the trees on this ridge, showing the difference in the size of the trees on the right and left sides of the ridge.



Now follow the trail into the forest.



#3 Winter Meadows

During the winter in the Montane, winds often blow away all of the snow. Sometimes, the wind will turn into a warm wind called a Chinook, which can melt any snow that is left.

These changes in temperature are difficult for meadow plants to live in, and so they have *adapted*. Some plants cover their leaves with a waxy coating that stops the air from drying out the plant leaves.

What adaptations do plants have to protect their leaves from drying out?

The Chinook wind is one that can blow in Alberta during the wintertime. Have you ever felt this wind? Describe what you feel when a wind like

this is blowing.

On the previous page two plants that grow in this area have been drawn. Find a Bearberry plant and a Juniper bush in this area. Ask your teacher or another adult to help you if you cannot find these plants.

Can you feel and see the waxy coating on each leaf?

yes no

Compare the leaf of the Bearberry or the Juniper with a blade of grass. Which feels waxier?

the Bearberry or the Juniper the grass

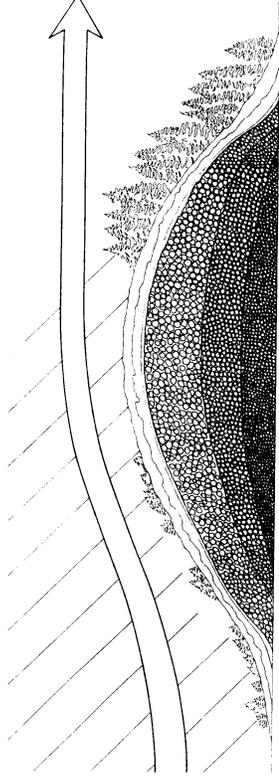
Now, continue walking down the trail. You will pass the two signs shown below. Stop when you come to Stop #4.



BORN OF FIRE



THE MAKING OF THE VALLEY



#4 FACING EAST; FACING WEST

Face the last sign you were at. Which side of the ridge has bigger trees - the left side or the right side?

left side right side

As you can see, the right side has bigger trees. To the west (the left side of the ridge), many of the trees have been killed by lack of water. The hot sun and the west wind have kept the soil dry and very little moisture reaches the roots of the trees.

To the east (the right side of the ridge), the ridge acts as a windbreak. The ridge shades the soil from the warm wind and the hot, drying sun,

Find a comfortable spot near the trail and listen for forest sounds. Write a Haiku poem about the sound you hear.

The art of Haiku is to put into words the quick feeling you get when you focus your senses on something.

Haiku poems do not have to rhyme.
Haiku poems have only three lines.
Each line has a certain number of syllables:

- Line one has 5 syllables.
- Line two has 7 syllables.
- Line three has 5 syllables.

Here is an example of a Haiku about a sound:

Whistle of a bird (5 syllables)
Passing over the forest (7 syllables)
It touches my heart (5 syllables)

Now write your own Haiku.

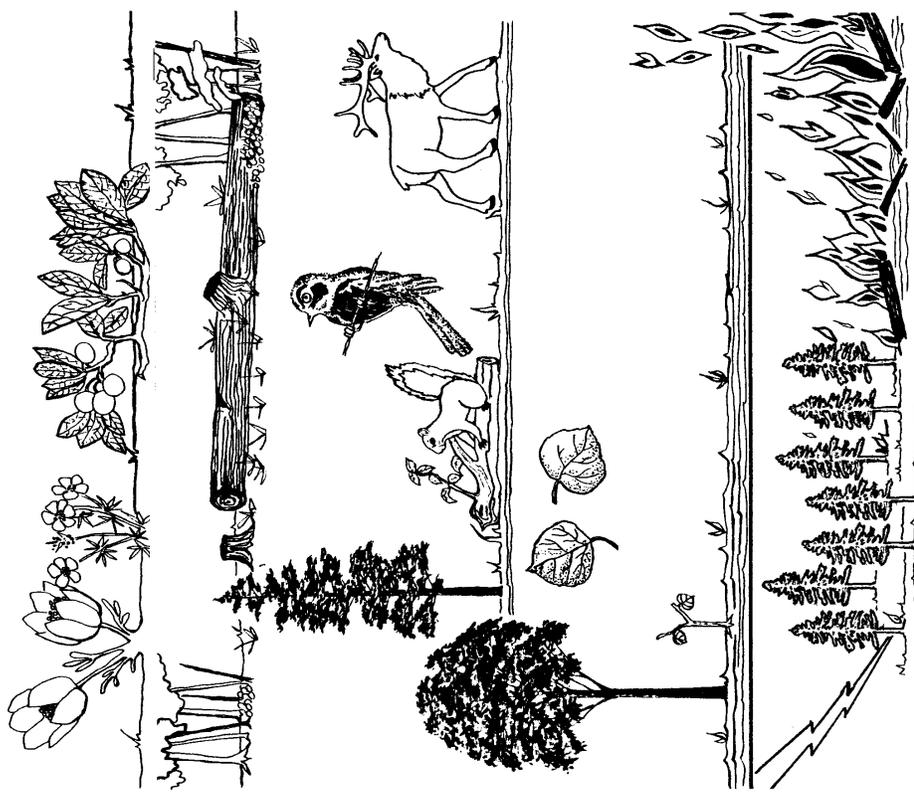
When you finish, wait for an adult to lead you to the visitor centre area. Please stay out of the parking lot; it can be dangerous.

We hope you had a good day!!

WHERE FOREST MEETS PRAIRIE

Volunteer's Notebook

THE MONTANE TRAIL AT BOW VALLEY
PROVINCIAL PARK



Name: _____

JUST BEFORE YOU BEGIN... A NOTE TO VOLUNTEERS.

Groups of two are to work as partners and help each other during the field study. Where possible, match good readers with poorer readers to allow each pair some independence from adults during the field trip. You may choose to read aloud to students at some of the stops.

Your responsibilities are to help ensure proper student conduct, to help with the reading at each stop, and to help students arrive at their own answers. Please avoid simply providing students with an "answer"; rather, encourage the students to think for themselves.

A pre-arranged signal will be given to draw students together.

Remind your class that they are in a Provincial Park:

- *Emphasize to them that they are visitors to the area and should act as responsible guests in someone else's home. Explain to the students that this is home to many different plants and animals, and that it is their job to leave the park just as they found it.*
- *Encourage students to smell, look, listen and touch as long as nothing is disturbed in the park*
- *ask them to stay on the trail*
- *Restrooms are available inside the Visitor's Centre.*

To avoid overcrowding in one area, and depending on your adult - student ratio, you may wish to begin groups at different stops along the trail.

Students may often become excited by this new type of study, and their written work may suffer as a result. You may wish to check the students' notebook every once in a while.

Students may not be used to working with this type of booklet. The answers to most of the questions asked in this booklet are answered in the information preceding the question: tell the students that they only have to read and understand the text to be able to answer these questions. The answers to additional questions are found in the Volunteer's Notebook that you are holding, and are written in this small print style.



LOOK AND LISTEN

If you listen carefully, you may hear the chatter of a squirrel or the twittering call of a mountain Chickadee. If you look closely, you may see elk droppings, or a trail made by animals through the forest.

Look in the forest around the sign. Can you see any piles of chewed pieces of cone left by a Red Squirrel?



yes



no

Whenever you travel in Bow Valley Provincial Park, you are in the Montane forest, the place where mountain and prairie life mix.

For the next activity, you should place the students in a comfortable location. You may wish to lead students back toward the powerline, since the last sign is quite close to the parking lot.

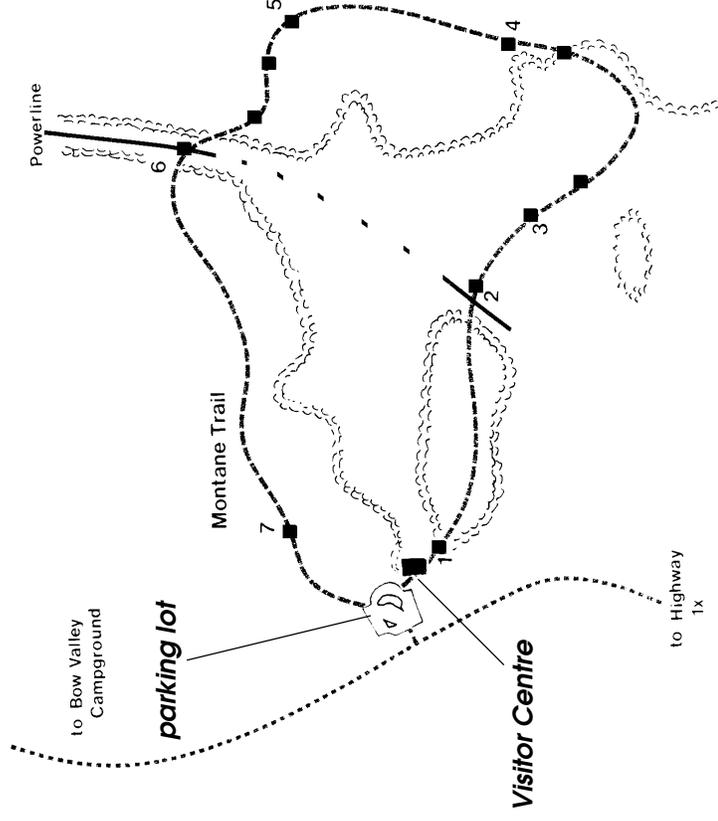
Describe one adaptation that you think the insect has.

Is this a structural or behavioural adaptation? Explain why.

When you finish, move on to the next stop. If you walk quietly, along the way you may see some animals that live in the Montane forest.

You can make a more interesting experience out of this if you wish: send the students down the path, either singly or in pairs, asking them to walk softly and to use all of their senses.

Montane Trail



Note: there are a total of ten marked signs along the length of the Montane Trail. Although you are welcome and encouraged to read them, the text is generally too difficult for students at the Grade 5 level. For this reason, seven sites along the length of the Montane Trail have been chosen as Environmental Education sites. The activities to be done at each site are described in this booklet.



#1 A MEETING PLACE

Montane is not another word for mountain, but means something else. The Montane is the name we give to the area where the forests meet the prairies. As we walk around this area, we will see grasses that remind us of the prairies. We can also see trees that remind us of the forest.

The place where prairie and forests meet is called the _____

Count the number of different kinds of trees in the small patch of forest. Use the shape of the leaves to tell you if the trees are the same as each other or different from each other.

There are _____ different kinds of trees.

There are three tree species here: Aspen Poplar, Lodgepole Pine, and White Spruce.

STOP #6

At this stop, you will use the magnifying boxes and pooters that you brought with you to observe any insect that lives in this grass.

1. Use the Pooter to catch an insect in the grassy area.
2. Release the insect into the magnifying box.
3. Observe the insect. In the space below, make a drawing of the insect, including as many details as you can. Fill the whole space with your drawing.

How does a deep root system help the trees?

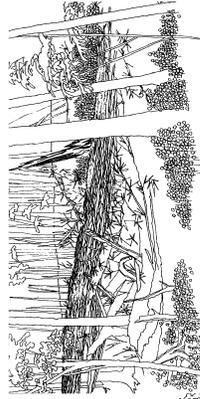
What structural adaptations do Douglas fir trees have that protect them from fires?

Now move to the next stop. On the way to the next stop you will pass two signs whose pictures are shown below. Read these with your classmates if you like.

Stop #6 is a special stop that is NOT marked by a sign. It is located at the grassy area beneath the power line. Stop here and read the instructions for this stop.



**ANOTHER
TREE,
ANOTHER
FOREST**



FALLEN GIANT

These trees live together as part of a forest community. A community is a place where plants and animals live and meet their needs. Name an animal that might live in this forest community.

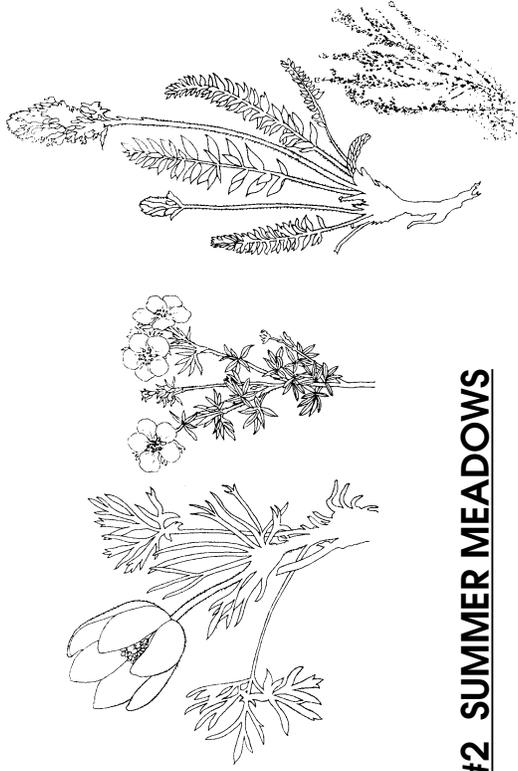
White-tailed deer and mule deer, coyote, snowshoe hare, grouse, elk, and many other animals might be found in this type of forest area.

What is a community?

Walk 20 giant steps along this trail. Here you can see a grassy field that looks like the prairies. Plants and animals that live in these grassy areas can also be found living near Calgary. The flat area that stretches for miles all around Calgary is called the Prairies.

Touch the ground between the grasses with your hand. You are touching the grassland community. The forest community and the grassland community occur in patches in the Montane.

Now go down the trail to the next stop.



#2 SUMMER MEADOWS

The summer sun and the dry winds that blow all year long are two important things that keep this patch of prairie looking like it does.

This meadow and Alberta's prairies are alike. What two things help to make them alike?

The plants growing here have developed *adaptations* that allow them to survive both hot summer sun and drying winds. An adaptation is something that plants and animals have that allow them to survive better.

What does "Adaptation" mean? _____

my drawing of a Douglas Fir cone

Douglas firs are well adapted to life in the Montane forest. Their thick bark protects the trees from fire. Their roots penetrate deep underground to give support against strong winds. Their root systems are wide-spreading to obtain water. Douglas Firs may live for 1,000 years.

How does a wide, spreading root system help trees?



#5 MONTANE GIANT

The tree to the left of the sign is a Douglas Fir. According to Indian legend, tiny mice hide in the cones of Douglas firs. Find a Douglas fir cone. The picture above will help you to identify the right cone.

Help the students to find a Douglas fir cone; there are many spruce cones in this area as well. Look for the unique "mouse tail and mouse legs" protruding from beneath the individual scales of the cone.

The Indian legend says that mice are hiding in the cone. Use your magnifying lens and your imagination: can you see their feet and tails?

yes no

Make a large drawing of a Douglas fir cone in the space provided on the next page. Fill the whole space with your drawing.

If you look carefully, you can see very fine, silvery hairs on the leaves of some plants. Get down on your hands and knees so that you can look closely at the plants, and use your magnifying lens. These small hairs help protect the leaf surface from the sun's heat and the drying effect of the wind.

The small, silvery hairs can be seen on the leaves of the Pasture Sage or Locoweed. Use the interpretive sign at this stop to help you to identify these plants.

As you look over the meadow, what do you see more of: plants growing low to the ground or plants that grow tall?

more tall plants more low plants

There are more low plants here. By growing low to the ground, plants can avoid much of the hot dry wind!

Try this experiment: feel how much air is blowing against your face when you are standing on your tip toes. Now lie down on the ground so that your chin is touching the ground. Which feels windier?

It feels windier when I'm on my tiptoes

It feels windier when my chin is touching the ground

Note to adult: if you like, ask the students to repeat their experiment by wetting a finger and holding it first in the air above their heads and then later down among the grasses. Students should find that their finger dries off more rapidly in the first position, since there is more air movement above their heads than in the grass.

If you were a plant and you didn't like the wind because it dried you out, would you prefer to grow close to the ground or high above the ground?

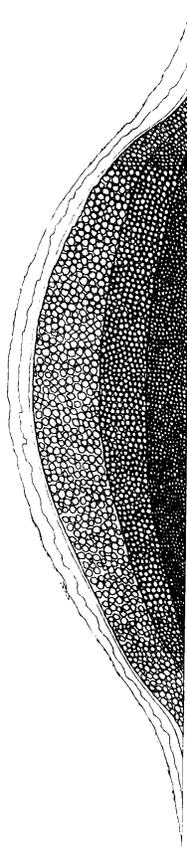
- close to the ground
- high above the ground

Why have many of the meadow plants developed the adaptation of growing close to the ground?

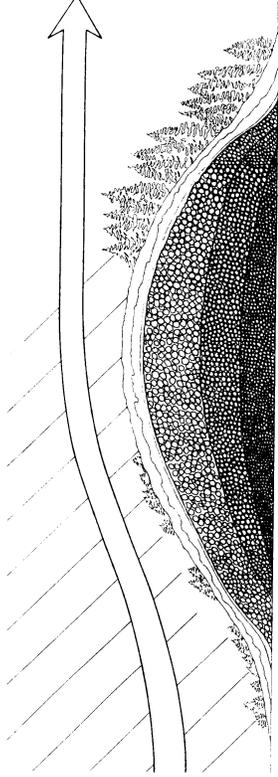
Use your 4-meter ruler string and make a 1-meter square on the ground. List the number of *different kinds* of plants in this 1-meter square area. Remember to use lots of good describing words! Two of the plants have been listed for you.

On the west side of this hill, two things have made it difficult for the trees to grow. What are these two things?

Draw some of the trees on this ridge, showing the difference in the size of the trees on the right and left sides of the ridge.



Now follow the trail into the forest.



#4 **FACING EAST; FACING WEST**

Face the last sign you were at. Which side of the ridge has bigger trees - the left side or the right side?

left side right side

As you can see, the right side has bigger trees. To the west (the left side of the ridge), many of the trees have been killed by lack of water. The hot sun and the west wind have kept the soil dry and very little moisture reaches the roots of the trees.

To the east (the right side of the ridge), the ridge acts as a windbreak. The ridge shades the soil from the warm wind and the hot, drying sun, allowing moisture to be used by the plants.

description of the plant I found

- 1 long, spiky grass
- 2 short damp moss
- 3
- 4
- 5
- 6

Stress to the students that the names of the plants are not important; this exercise allows students to practice similarities and differences, and also to see that there are many different types of plants in a meadow. A sample list might be: long spiky grass; short damp moss; taller plant with green leaves; purple flower; tiny plant with silvery leaves.

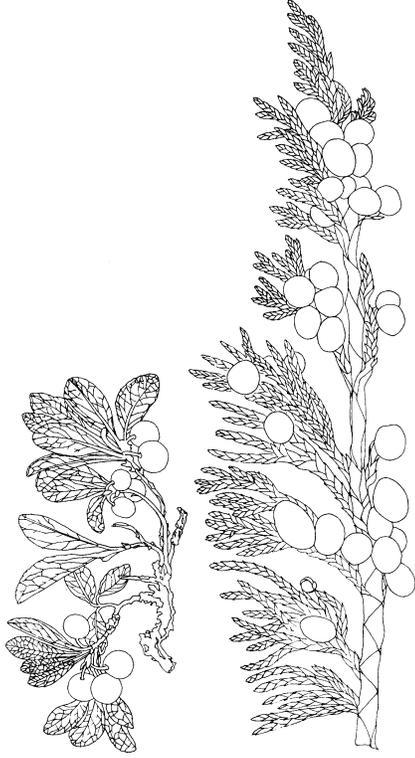
Our group found ____ different kinds of plants.

Remember, a community is a place where animals and plants live and meet their needs. Is this a community that you are studying?

yes no

Yes - this is a Meadow Community. If students have trouble with this, ask them to imagine that they are an ant walking through the meadow - to the ant, the area must seem like an endless forest community.

Move down the path to the next stop.



#3 Winter Meadows

During the winter in the Montane, winds often blow away all of the snow. Sometimes, the wind will turn into a warm wind called a Chinook, which can melt any snow that is left.

These changes in temperature are difficult for meadow plants to live in, and so they have *adapted*. Some plants cover their leaves with a waxy coating that stops the air from drying out the plant leaves.

What adaptations do plants have to protect their leaves from drying out?

The Chinook wind is one that can blow in Alberta during the wintertime. Have you ever felt this wind? Describe what you feel when a wind like this is blowing.

On the previous page two plants that grow in this area have been drawn. Find a Bearberry plant and a Juniper bush in this area. Ask your teacher or another adult to help you if you cannot find these plants.

Can you feel and see the waxy coating on each leaf?

yes no

Compare the leaf of the Bearberry or the Juniper with a blade of grass. Which feels waxier?

the Bearberry or the Juniper the grass

The two stops shown below are the next two stops of the Montane Trail. Feel free to read these signs and explain their content to the students. The next stop described in this booklet is at the stop called "Facing East, Facing West".



BORN OF FIRE

THE MAKING OF THE VALLEY

