

A black and white photograph of a tree trunk, showing the bark texture. A green crosshair is overlaid on the image, with a vertical line on the left and a horizontal line across the middle. Three green rounded rectangular boxes are placed over the image, containing text.

# *Alberta Parks*

## Trees & Forests

### Field Study Planning Guide

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## 1.0 Introduction

Welcome to the teacher's planning and activity package for **Tree-Tales**. This half-day program was developed to offer students a natural environment experience that supports both the Grade 6 Alberta Elementary Science Curriculum Topic: Trees and Forests and the mandate of Alberta Parks:

- **Preservation** – *to preserve in perpetuity a network of parks and protected areas that represent the diversity of the province's natural heritage as well as related cultural heritage.*
- **Heritage appreciation** – *to provide opportunities to explore, understand and appreciate the natural heritage of Alberta, and enhance public awareness and our relationship to and dependence on it.*
- **Outdoor recreation** – *to provide a variety of natural landscape dependent outdoor recreation opportunities and related facilities and services.*
- **Heritage tourism** – *to encourage residents and visitors to the province to discover and enjoy the natural heritage of Alberta through a variety of outdoor recreation and nature based tourism opportunities, facilities and accommodation services.*

### 1.1 Program Outline

**Trees and Forests** is a guided program that consists of three components:

- Preparatory activities that are multidisciplinary in nature, can be completed at the school.
- A half-day field study conducted in a protected area that takes students through experiential activities focused on trees and interdependencies within forests.
- Post-visit activities, to be done at the school, that are intended to reflect on and apply what the students have learned.

Note: Checklists, which will help you organize your field study, are provided in this package.

### 1.2 Program Objectives and Curriculum Fit

This field study program and the preparatory and post field study activities that complement it, have been designed to address specific learner expectations from Topic E: Trees and Forests (Grade 6) in the Elementary Science Program of Studies.

- Identify reasons why trees and forests are valued. Students meeting this expectation should be aware that forests serve as habitats for a variety of living things and are important to human needs for recreation, for raw material and for a life-supporting environment.

- Describe the kinds of plants and animals found living on, under and among trees; and identify how trees affect and are affected by those living things.
- Identify general characteristics that distinguish trees from other plants, and characteristics that distinguish deciduous from coniferous trees.
- Identify characteristics of at least four trees found in the local environment. Students should be familiar with at least two deciduous trees and two coniferous trees. Examples should include native species, such as spruce, birch, poplar, and pine and cultivated species, such as elm and crab apple.
- Describe and classify leaf shapes, leaf arrangements, branching patterns and the overall form of a tree.
- Interpret the growth pattern of a young tree, distinguishing this year's growth from that of the previous year, and from the year before that. Students meeting this expectation should recognize differences in colouration and texture of new growth and old growth, and locate scars that separate old and new growth.
- Identify human actions that enhance or threaten the existence of forests.

There are additional curriculum connections within the Language Arts, Social Studies and Mathematics program of studies.





## 2.0 Planning Your Visit

Alberta's provincial parks and protected areas are ideal "outdoor classrooms". Our education staff provide direct programming and support materials to schools and youth groups in various sites. These services are aimed at increasing environmental awareness, understanding and stewardship of the natural world.

To provide your groups with the best experience possible, please review the following section thoroughly.

### 2.1 Safety in the Park

#### **Your role...**

School groups need to be prepared for the possibility of accidents. We strongly recommend that teachers and/or chaperones have a recognized and current first aid certification.

#### **Our role...**

In the event of an emergency, there are existing emergency response programs in place at our sites. Onsite personnel have basic first aid and CPR certification. As well, they can access emergency services such as local emergency medical services, STARS Air Ambulance and R.C.M.P, by cellular and satellite telephone and radio. Depending on location, time of response is approximately 20 minutes.

Teachers can also access these resources by dialing 911 where satellite reception is available. If you are guiding your own field study, please check with park personnel to verify your access to local communication sources.

### 2.2 Park Facilities

Many parks and protected areas offer groups the following facilities and services:

- A professional interpreter to guide you on your discovery (and to answer any questions about the visit package).
- All equipment needed for the field study (unless specified in this package).
- Staging/day use areas equipped with a shelter, water pump, pit toilets, and firepits.



## 2.3 Planning Checklist for Your Field Study



### Did you remember to...

- ☐ arrange for transportation to and from the park?
- ☐ confirm the meeting location with your interpretive guide?
- ☐ prepare student material (if required) and complete pre-visit activities at school with students?
- ☐ divide your students into small groups and select a volunteer leader for each group?  
We recommend 1 adult for every 5 students
- ☐ arrange for and prepare adult volunteers? We appreciate their help and they will be expected to participate in the program. It would be beneficial to:
  - clarify what their roles and responsibilities will be during the field-study
  - provide volunteers with any information they may need for the day
  - orient them to any specific health or student concerns
- ☐ ensure that students have lunches (if you are not preparing a BBQ) and that they are appropriately dressed for the weather?
- ☐ encourage students to reduce garbage in the park by bringing garbage-free lunches such as: reusable lunch bags and containers, drinks in cans or bottles?
- ☐ review and discuss the park rules and behavioural expectations found in the Class Preparation Checklist For Your Field Study on pages 7-8?



## 2.4 Class Preparation Checklist for Your Field Study



**Here is a checklist of things to review at school prior to your field study.**

- ☐ Discuss the roles and importance of provincial parks and protected areas.
  - Alberta contains many different natural landscapes and is home to numerous plant and animal species. Our parks and protected areas network helps to ensure that this environmental diversity is preserved for future generations. For more information on the parks and protected areas network, visit our web site at [www.albertaparks.ca](http://www.albertaparks.ca).
- ☐ Discuss how behaviour can affect the natural environment in a protected area. Have the class make a list of things they can do that show respect for living things and a commitment to their care. This list can include:
  - Leave ant hills, nests and rotting logs alone. These are homes for small animals.
  - Walk carefully around bushes and trees, rather than through them.
  - Stay on trails; do not pick or remove anything in a protected area, unless it is garbage.
- ☐ Discuss outdoor safety by creating an outdoor classroom safety plan. This plan could include:
  - Have a buddy that you spend the day with.
  - Always be in view of your teacher or adult leader.
  - Don't approach wild animals.
  - Wear appropriate clothing for the season and for the activities of the day.
- ☐ Discuss behavioural expectations while in the park. Teachers are responsible for the behaviour and discipline of the student during our programs.
  - Explain that they are ambassadors for their school.
  - Review appropriate behaviour, both indoors and out.
  - Discuss the facility or the part of the park they will be visiting. Explain that the field study is a school, just a different location. All the school rules apply. Other schools will be using the park to work as well.



☐ Discuss the Park rules:

- Wildlife live in parks and protected areas because they are able to meet their needs for food, water, shelter and space. Feeding them is not necessary. In fact, it can create significant hardships for them because they become dependent on this food and the learned behaviors associated with this can also be dangerous for them. **Do not feed or harass wildlife.** Observe them quietly from a distance.
- Thousands of people visit parks and protected areas each year. If each person took only one cone or picked one plant, it would still have a very significant impact on the natural environment. **Cutting, defacing, picking or removal of any plant, fossil, rock or other Park material is prohibited.** Take only pictures; leave only footprints.
- If those same thousands of people threw their garbage on the ground, it would be difficult to clean up and dangerous for wildlife that could mistake the litter for food. **Litter should be placed in garbage cans or in your pocket** if no garbage cans are available.
- Parks and protected areas should remain a natural place. Wildlife are not accustomed to pets chasing them or threatening them with noise. For these reasons, **pets must be on a leash** in the Park. This not only protects wildlife, it also protects people and their pets as well.
- Open fires are a threat to park habitat and human safety. For these reasons, **campfires are permitted only in designated firepits** located in picnic area. When using a firepit, please provide your own roasting sticks and kindling. **DO NOT USE BRANCHES OR DEADFALL FROM THE PARK** for the fire, and remove all garbage from the firepit area. Ensure your fire is out completely before leaving.





## 3.0 Pre-visit Activities

The following pages contain a variety of pre-visit and post-visit activities that complement your field study and provide students opportunities to practice the skills that they will be using during and after their trip. If possible, invite the adult volunteers into the classroom to also experience these activities.

Feel free to use your own activities or the ones described in this package. Choose activities that reflect each specific learner expectation from the curriculum that will be addressed on the field study day (see **Section 1.2 Program Objectives and Curriculum Fit**).

### 3.1 Vocabulary

Review the following vocabulary with the class. This can be done in a number of ways:

- The words could be incorporated into the spelling program by using them in a weekly quiz.
- Students could be given a copy of the vocabulary list and asked to create poems or a crossword puzzle using the words on the list.
- A “Who Am I?” guessing game could be used that presents clues about each word individually. After each clue, students would deposit written guesses about what they thought the word was into a guessing box. For example:

#### Who Am I?

Clue 1:

I am usually tall and thin with a surface root system.

Clue 2:

I have long thin leaves to diminish transpiration in cold weather.

Clue 3:

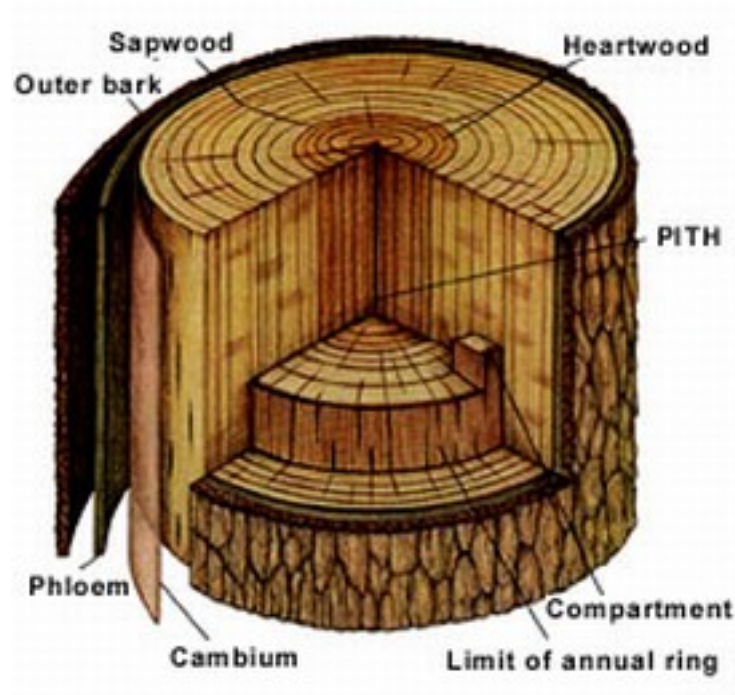
My seeds are stored in cones.



This terminology is used throughout the field study program. The more familiar students are with this vocabulary the more successful their field study experience will be.

- ***Alternate*** – leaves placed singly at different heights along a stem
- ***Blade*** – flat part of a leaf
- ***Biodiversity*** – the variety of life on earth; genetic variability within the species and the variety of ecosystems in which they live
- ***Cambium*** – the new wood growth that occurs just under the bark that produces new xylem and phloem
- ***Compound*** – leaf made up of several leaflets
- ***Coniferous*** – tree or shrub that bears its seeds inside cones. Most species have small, needle-shaped evergreen leaves
- ***Deciduous*** – tree or shrub that sheds leaves annually
- ***Ecosystem*** - an interdependent system of living organisms and their physical and geographical environment
- ***Growth rings*** - the dark rings that are visible in a cross section of a tree trunk that indicate one year of growth
- ***Heartwood*** – the older, non-living, middle part of the tree trunk that helps stabilize and strengthen the tree
- ***Leaflet*** – blade or a compound leaf attached to a common leaf stem
- ***Lobed*** – a particular type of leaf in which the blade is prominently indented
- ***Margin*** – edge of the leaf blade, usually described as smooth, wavy or serrated (toothed)
- ***Opposite*** – two leaves originating at the same point on opposite sides along a stem
- ***Phloem*** – living tissue that carries organic nutrients, particularly sucrose, to all parts of the plant where needed
- ***Sapwood*** – (also known as xylem) tissue that carries water up the root and stem

- ***Simple*** – single bladed leaf
- ***Tap root*** – a root that extends deep into the ground to gather water and stabilize the tree
- ***Toothed*** – notches along the leaf edge that resemble teeth
- ***Xylem*** – (also known as sapwood) tissue that carries water up the root and stem to the leaves



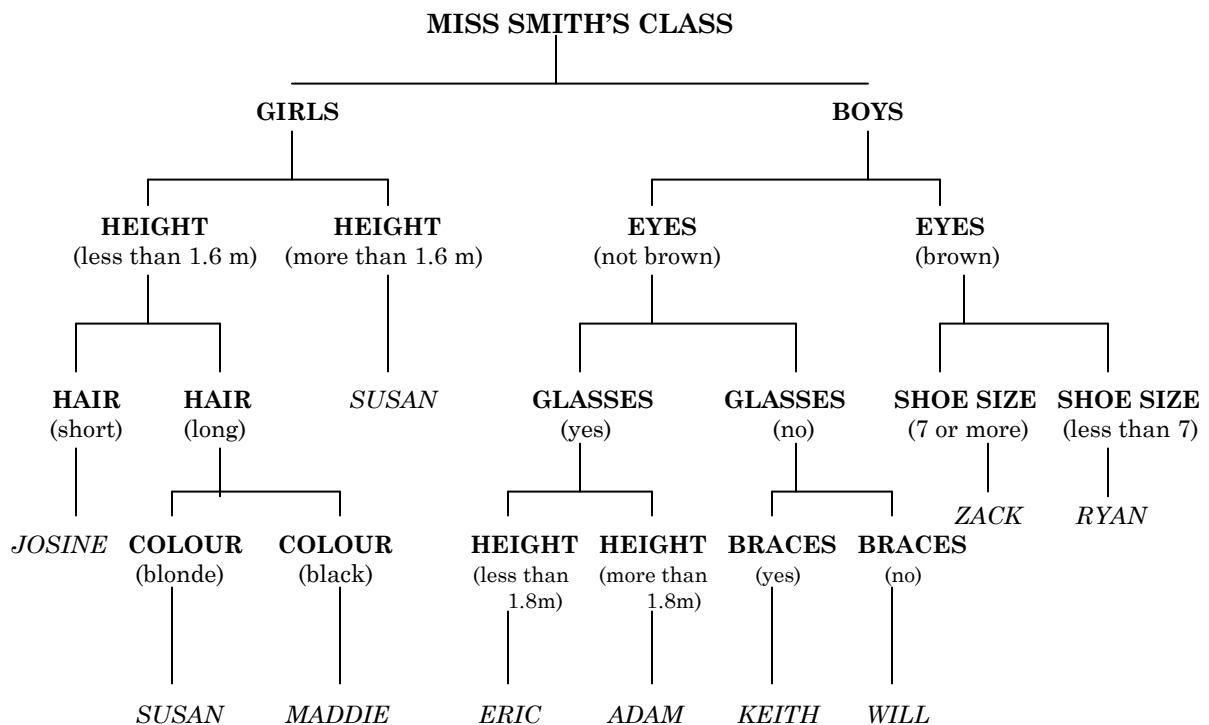


### 3.2 Understanding Keys

To aid in identification, organisms are classified into different categories by judging degree of apparent similarity and differences. A portion of your field study is devoted to identifying trees and shrubs. The students will observe and record characteristics of at least 4 different trees. To identify each tree, students will use a copy of The Guide to the Common Trees and Shrubs of Alberta. The following activity will help students develop an understanding to why and how keys are a useful system of classifying knowledge.

#### KEY THE CLASS

Develop a keying system for the members of the class based on observation. The first split, for example, can be by sex or between students with or without glasses. Other divisions can be made according to hair colour and/or length, height, shoe size and so on. Refer to the following sample of a class group keyed out. Direct the students to take the key as far as an individual, for example, each student's name.



Follow up the keying activity with a discussion about the key they will use at the park. Tree identifications at the park will be made on the basis of this keying concept. For example, two species of trees may belong to a certain Family because they share particular traits. However, they may each be in a different Genus because of differences in other features.



### 3.3 Interdependency in Ecosystems

Review the following ecological concepts with your students:

- **Interdependency** – all organisms rely on other organisms to fill some or all of their survival needs of food, water, space and shelter
- **Adaptations** – specific structures and behaviours that help an organism survive within a specific ecosystem
- **Ecosystem** – community of organisms interacting with its environment, including non-living factors such as soil and water

Have the class create a chart or web listing the ways organisms affect or are affected by trees. Remind the students, if necessary, that the relationship may not be as obvious as food and shelter. They need to consider factors such as micro-climates, moisture, shade or soil acidity. Keep copies of the charts or webs. You will need them during the post-trip activity.





## 4.0 Post-visit Activities



### 4.1 Classification Keys – Class Discussion

Review classification keys with the students. Points to explore might include:

- Does everyone understand how to use a key?
- What are the advantages of using a key to identify something?
- Were the students more confident that they had the correct identity for a tree or shrub than if they had tried to identify it by going through a field guide page by page?
- Did using the key help the students learn and focus on the distinguishing characteristics of trees?
- What are other possible applications of the key classification format?

#### 4.1.1 Multi-Choice Keys

Explain to the students they have been working with **dichotomous keys**: that is, keys that present the user with only 2 possibilities to choose from at a time. Not all keys are dichotomous; sometimes the user may have more than 2 possibilities to choose from. Have the students select a topic and then develop a multi-choice key to classify 15 items. Some possibilities are listed below:

- **Favourite television programs**: distinguishing characteristic may include: length of program, type (comedy, news, drama, sports, etc.) locations, characters, number of times aired weekly etc.
- **Favourite songs**: distinguishing characteristics may include: pace of beat, solo, duet or group, length of song, video or movie, theme of song.
- **Popular fast foods**: distinguishing characteristics may include: restaurant, frozen or deli, restaurant outlet or brand named, beef, chicken or other, burger, sandwich, pizza or other etc.

When the keys are completed, have the students list their 15 items separately. Students should then cover up the answers on their keys and exchange keys and lists with another student. Can the students follow the key through and match-up those items that with which they are familiar?

After the students have worked through several keys, ask them, in a class discussion, to evaluate multichoice keys as a learning tool. Which type of key do the students prefer?

#### 4.2 Forest Inventory Follow-up

Divide the class back into the small groups they had during the field session. Distribute the Tree Tales Student Booklets provided at the field study. On the blackboard, compile a class list of discoveries found in the different layers of the forest. What is the relationship between each organism and the trees at each level? How does this list of relationships compare to the list compiled during the preparatory activity? Did the students discover some relationships they had not considered prior to their field trip? Correctly identifying every relationship is not critical. The students will learn from the process of considering the possibilities.

#### 4.3 The Values of Trees

A. Using a class discussion, compile a master list of the functions of a tree in the environment. The list may include:

- absorb carbon dioxide
- release oxygen
- modify the climate through shade, humidity and wind reduction
- provide food for animals and other plants
- provide shelter for animals and other plants
- watershed maintenance

B. Using a class discussion, compile a master list of how people use trees. This list may include:

- food
- shade
- hike and biking
- paper
- lumber
- firewood
- esthetics
- art

Organize the uses into the different categories of forest values: ecological, economical, cultural, spiritual, and recreational.



- C. Have the students use the ideas in the two master lists to create a collage illustrating the values of trees. Students could draw their own pictures or cut them out of magazines, old calendars or newspaper advertisements.

#### 4.4 Sustaining Our Forest Ecosystem

Imagine that you are looking at a handmade quilt made up of individual patches with different fabrics, colours, shapes, and sizes. They are stitched together into a beautiful and complex quilt. Removing one patch will not ruin the quilt, but it will lose some of its strength and beauty. Remove too many patches and you will destroy the quilt.

One can say that a forest ecosystem is like a quilt. This “quilt” is stitched together by a series of complex and dynamic interactions and interrelationships. The patches represent the birds, insects, trees, fungi, bacteria, etc., in the forest. This diversity of life is called **biodiversity**. Remove one patch and you will affect the forest’s biodiversity. Remove too many patches and you risk destroying the forest ecosystem. Thus, in order to sustain a functioning ecosystem, we must preserve biodiversity.

- Ask the students to give suggestions for preserving biodiversity at home, school, in the city and out of the city.

One strategy we use to maintain biodiversity involves protecting representative landscapes of Alberta’s biodiversity. Alberta Parks and Protected Areas is a provincial effort to protect, inform about and involve the public in Alberta’s environmental diversity. In these protected spaces, human activities are carefully managed and certain activities that harm ecological processes are controlled or prohibited. By protecting landscapes from potentially harmful activities, we protect the integrity of ecosystems.

Ask your students what they know about Alberta Parks and Protected Areas. Record their responses on the board. You might consider discussing the following:

- What are some activities that you do in these areas?
- What do these areas protect (biodiversity, habitat, birds)?
- Do these areas have social, economic and environmental values or impacts?
- What are the seven classifications of protected areas in Alberta’s parks and protected areas? (Ecological Reserves, Wilderness Areas, Wildland Provincial Parks, Wilmore Wilderness Park, Provincial Parks, Natural Areas, Heritage Rangelands, and Provincial Recreation Areas)

Divide your class into groups and create a 2 -4 page newsletter about a local protected area. Challenge the students to come up with some content for the newsletter. (See our website at [www.albertaparks.ca](http://www.albertaparks.ca) for more information). Some examples can be:

- Why are protected areas important?
- What do we protect?



- Who uses protected areas and what types of activities are they involved in?
- How can protected areas be damaged?
- What are some threats to protected area?

Each article should be 5 – 7 paragraphs long and can be written for the parents, teachers and students of your school.



#### 4.5 Natural Processes in the Forest

Preserving biodiversity is a challenging job. Not only does it involve protecting representative landscapes but sometimes, it involves considering and permitting natural disturbances such as, wind, disease, beavers, insect outbreaks, and fire. Natural disturbances serve to maintain forest functioning by: diversifying habitat patterns, maintaining soil nutrients cycling and adequate levels of soil nutrients, and allowing for natural succession.

Ask the students to identify the natural disturbances they observed during their field study. Create a web of the potential impacts could these natural disturbances have on the following:

- Natural landscapes
- Biodiversity
- Park infrastructure (trails, buildings, washrooms)

*(Please note that the impacts can be perceived as positive or negative.)*

Think of a situation involving a natural disturbance in a forest ecosystem where it might be necessary for a park manager to interfere with the process. Some examples are: beaver activity flooding a trail, wild fire threatening a building, dead trees



#### 4.6 Getting Involved

By helping students understand the importance of maintaining and enhancing biodiversity, they will gain a better understanding of how it affects them as individuals and how they can affect biodiversity. Have the students complete a web search on how they can become involved in preserving our protected landscapes. For example:

There are a number of parks and protected areas in need of volunteers. Visit our website at <http://www.cd.gov.ab.ca/involved/parks/volunteer/index.asp> for current opportunities.



## **Trees and Forests**

A field study program for Grade 6



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