



Work Wild Toolkit

Grade 6 Science: Trees and Forests

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Introduction

Your guide to seeing the forest through the trees.

The forest is a complex ecosystem that is shared by plants, animals, and people. Forests clean the air and produce oxygen necessary to sustain life. They provide shelter, food, resources, and a place to enjoy a wide array of recreational activities. *And they are a great place to go and experience nature in all its majesty.*

The activities in this toolkit will get students to consider the big picture of who uses the forest and sustainable management of this natural resource, with fun and engaging activities designed to reinforce learning.

Alberta Curricular Outcomes

Learner Expectation 1: Identify reasons why trees and forests are valued. Students meeting this expectation should be aware that forests serve as habitat for a variety of living things and are important to human needs for recreation, for raw materials, and for a life-supporting environment.

Learner Expectation 8: Identify human uses of forests, and compare modern and historical patterns of use.

Learner Expectation 9: Identify human actions that enhance or threaten the existence of forests.

Learner Expectation 10: Identify an issue regarding forest use, identify different perspectives on that issue, and identify actions that might be taken.

Resources

This toolkit is designed to give teachers the flexibility to use as an online resource, a hard-copy resource, or both. It has a variety of activities, including options for individual study or group work.

Students may download the Student Activity Handouts on the Work Wild website: workwild.ca (in the *Classroom Resources* section). Alternatively the student handouts are provided at the back of this Toolkit so they can be photocopied and handed out.

Are you ready to embark on our journey?



Lesson Plan Overview

Lesson Plan 1: Our Forest

Why are trees and forests valued? How do humans threaten forests? Even more importantly, how can we help protect forests? Students will watch the four-part video series, *It's Our Forest* and answer questions based on what they've learned. For an engaging group activity, we've provided the option of a fun game format.

Lesson Plan 2: Historical and Modern Patterns of Use in the Forest

What relationships do humans have with forests? How has our approach to protecting and managing forests evolved over time? To find out, students will explore the interactive Work Wild Forestry Timeline to compare forest management practices from pre-European settlement to present day.

Lesson Plan 3: Forest Issues and Management

Forests meet a variety of needs and serve many purposes. What are they? How can we strike a fair balance that takes all needs and uses into consideration? Using an interactive map, students will explore a forest individually or as a group and answer questions based on their findings. The module ends with a "campfire discussion" on key forest management issues.

Lesson Plan 1: Our Forest

Course

Grade 6 Science: Trees and Forests

Time

40-45 minutes

Assessment

Option 1 Summative: Mark student answers to assess comprehension.

Option 2 Formative: Assess whether students are participating in activity and grasping material.

Overview

Students will watch the *It's Our Forest* video (broken down into four parts) and answer comprehension questions, with the option of a fun game format.

Alberta Curricular Outcomes

Learner Expectation 1: Students will identify reasons why trees and forests are valued. Students meeting this expectation should be aware that forests serve as habitat for a variety of living things and are important to human needs for recreation, for raw materials, and for a life-supporting environment.

Learner Expectation 9: Students will identify human actions that enhance or threaten the existence of forests.

Materials

- *It's Our Forest* Video (Part 1 to 4):
<https://www.youtube.com/watch?v=TIlwHjbWwEM>
The link is found in the *Classroom Resources* section of the website under *Lesson Plans*.
 - Part 1: The Forest Ecosystem (0:00 – 4:12)
 - Part 2: Human Values of the Forest (4:12 – 8:02)
 - Part 3: Land-use Planning (8:02 – 13:37)
 - Part 4: People and Products (13:37 – 19:14)
- Toolkit Activity Handout - Students can either download these handouts online or be provided with hard copies. Blank handouts are included at the end of this package for printing/photocopying.

Activity

Students watch video (20 minutes)

Option 1: “Lone Wolf” (*Individual Answers*)

(10-15 minutes for question sheet, 10 minutes for marking/answer review)

After watching the video, hand students a copy of the question sheet. Give them 10-15 minutes to answer the questions. Once they have completed the handout, have students hand the sheet to a neighbour to mark.

Option 2: “Beware of... Animal Signs” (20-25 minutes)

Break up the class into teams of 3-4 students. Assign each team an animal name and special “signal/gesture” they will need to perform in order to be called on to answer a question. Below are some examples. (Groups can also come up with their own names.)

Eg.

- **The Growly Grizzlies Signal** - Stand up and hold their arms above their head
- **The Regal Eagles Signal** - Stand up and flap their arms
- **The Rockin’ Rabbits Signal** - Stand up and make rabbit ears above their head
- **The Squishy Fishies Signal** - Stand up and tread water like they’re swimming
- **The Wiggly Worms Signal** - Stand up and wiggle their bodies

Read each question. Tell students to stand up and perform their signal if they think they know the answer. Pick the student who is first. If they correctly answer, their team receives a point. If not, ask another student. The team with the most correct answers wins. This game can be continued over each of the four question rounds in Activity 1.

Alternatively, one student from each team sits in a chair at the front of the room facing the class. A new group of students comes up for each new question.

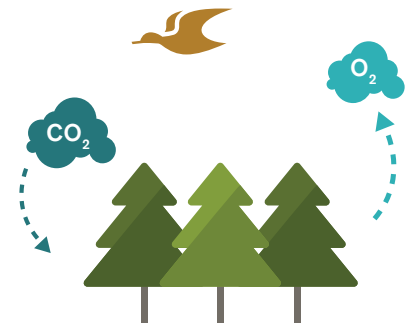


Activity 1 Handout - ANSWER KEY

Part 1: The Forest Ecosystem

Once you have watched Part 1: *The Forest Ecosystem* (0:00 – 4:12)

<https://www.youtube.com/watch?v=TllwHjbWwEM>, harvest your new found knowledge to answer the following questions.



- 1 Trees absorb carbon dioxide and produce oxygen. They also make food for themselves. What is this process called?

Photosynthesis

- 2 Healthy, growing forests absorb and store more carbon dioxide than they release.

Scientists use the term

Carbon Sink to describe this.

- 3 Which absorbs more carbon dioxide and produces more oxygen: younger or older trees?

Younger growing trees

- 4 Trees help keep our water clean. What part of the tree filters rainwater and melted snow to remove silt and other impurities?

Roots, soil, and wetlands

- 5 Other than trees, name two lifeforms that depend on the forest.

Answers may include people, animals, insects, flowers, mosses, fungi, and microbial organisms.

Part 2: Human Values of the Forest

If you go down to the woods today, you're in for... a quiz! Based on Part 2: *Human Values of the Forest* (4:12 – 8:02).

- 1 List three reasons that people use the forest.

Answers may include recreation (camping, hiking, etc.), natural resources (petroleum, wood), ranchers, settlement (homes), and subsistence (hunting, fishing, trapping).

- 2 How many seedlings are planted in Alberta each year?

75 million

- 3 What are two jobs related to the forest?

Answers may include engineering, trades, labour, research, wildfire management, environmental sciences, tourism, public relations, and government.

Activity 1 Handout - ANSWER KEY Continued

Part 3: Land-use Planning

Chop, chop! Let's see who knows the answer... based on Part 3: *Land-use Planning* (8:02 – 13:37).

1

Who owns the Crown forests in Canada?

The Canadian public.

2

In Alberta, before a forestry company can harvest trees, what does the government require them to create?

A plan (specifically: a forest management plan).

3

Name two things forestry companies must consider when making forest management plans?

Answers may include perspectives of all users of the forest, ages of trees, roads needed, water, wildlife habitat, profit, jobs, recreation, and the environment.

Part 4: People and Products

Can you root out the answers to the following questions? Based on Part 4: *People and Products* (13:37 – 19:14).

1

Name three forest products:

Answers may include building material like lumber, oriented strand board (OSB), and cross-laminated timber (CLT), fuel, plastics, paper, facial tissue, car parts, clothes, furniture, and houses.

2

Which insect is causing problems in British Columbia and Alberta's pine forests?

Mountain pine beetle

3

How many people work in Alberta's forest sector?

Over 20,000

Lesson Plan 2: Historical and Modern Patterns of Use In The Forest

Course

Grade 6 Science: Trees and Forests

Time

70 minutes

Assessment

Activity 2a Summative: Mark student answers to assess comprehension.

Activity 2b Formative: Assess whether students are engaging with discussion points.

Overview

Students will examine the forestry timeline and compare how human uses of the forest have evolved over time.

Alberta Curricular Outcomes

Learner Expectation 8: Students will identify human uses of forests, and compare modern and historical patterns of use.

Materials

- Work Wild Forest Timeline found in the *Education Resources* section of the website.
<http://workwild.ca/classroom-resources/student-activities/activity-2-historical-modern-patterns-of-use-in-the-forest-timeline/>
- Toolkit Activity 2 Handouts - Students can either download these handouts online or be provided with hard copies. Blank handouts are included at the end of this package for printing/photocopying.

Activity

As a class or individually, students will look through the Interactive Timeline on the Work Wild website where they will be presented with dates, facts, and photos. (20 minutes)

Activity 2a: “It’s All On the Line” Quiz (20 minutes)

Once the students have gone through and discussed the timeline they will be asked to fill out the timeline handout where they will match a list of facts with the appropriate time periods.

This could also be handled similarly to Activity 1, where the class is divided into small groups, and are required to perform their “animal signs” before being called upon to answer questions. Score may be kept to determine the winning team.

Activity 2b: “Changing Attitudes. Forward Progress.” Class Discussion (30 minutes)

The timeline topics each fall into one of three categories:

1. Changes in Environmental Stewardship
2. Changes in Wildfire Management
3. Changes in Production Practices

Choose one (or more) of the topics above and discuss how practices have evolved, the reasons why, and what the impacts may be. Use the *Activity 2b Class Discussion Guide* provided to lead the discussion or distribute to students. Note, there are three different sheets that correspond to the specific topics described above.



Activity 2 Online Timeline

Historical and Modern Patterns of Use In The Forest

Below are the facts included in the online timeline.



Teepee

Pre-European Settlement

- Humans arrive in Alberta 10,000 years ago. They use wood for warmth, cooking, and shelter.
 - Indigenous Peoples are the original forest managers. They prevent the spread of wildfires by burning small sections of forest ahead of a blaze, depriving it of fuel.
 - Fire is set intentionally to create habitats for desired species (such as moose and bison), to encourage growth of edible plants, and to clear travel routes.
-



Arrival of Europeans

1700s

- Europeans arrive in Alberta mid-century. Trees are cleared to make way for habitable land. Conservation is not yet a priority.
- The fur trade industry realizes the importance of forest management in protecting its commercial interests. Strategies are developed to increase access to animal pelts. Prescribed burns help maintain young forest habitats preferred by beavers and muskrats, while fire suppression helps maintain mature habitats preferred by squirrels and martens.
- Settlers harvest wood to heat homes and institutions.



Fuel Wood

Historical and Modern Patterns of Use In The Forest



Long Saw



Lethbridge Sawmill

1800s

- Manual sawmills produce 50-150 boards/day.
- Most sawmills are semi-permanent and located along rivers to transport logs by water. They're usually built near large settlements and railway lines.
- *Crown Timber Act (1849)*: The Crown grants cutting rights on its lands to the highest bidders.
- Alberta's first powered sawmill is constructed in Lac La Biche (1871), producing 500 to 1,000 boards/day.



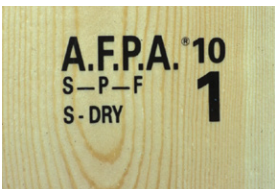
Steam Engine Train



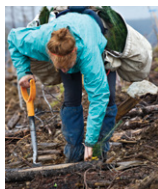
Lookout Tower

1900 – 1940s

- Arrival of the first steam-powered log hauler (1901).
- Alberta's first wildfire lookout cabin is constructed. Rangers watch for smoke and fire, and monitor weather conditions (1921).
- Alberta assumes ownership and responsibility of forests from the federal government (1930).
- Alberta Forest Products Association (AFPA) is founded (1942). It establishes guidelines and standards around lumber quality.
- A new provincial act requires companies to limit harvest to the amount of new growth occurring in the area and to replant in harvested areas (1949).



Lumber Grading



Tree Planting

Historical and Modern Patterns of Use In The Forest



Forest Community



Log Truck



Alberta Forest Service

1950s – 1980s

- The start of large-scale forestry in Alberta.
- Permanent mill sites take root in communities where forestry will become a key industry.
- Alberta's first Forest Management Plan is created in 1961 – based on sustained yield practices and information gathered from forest inventory.
- Modern logging trucks increase hauling capacity.



Environmental Certification



FireSmart

1990s – Present:


- Modern sawmills become capable of producing 24,000+ boards in just 8 hours.
- Environmental certification programs are introduced to establish consistent sustainability standards for forestry companies and to educate the public on the sustainability of the forest sector.
- Starting in 1998, detailed Forest Management Plans are required for every company harvesting trees on public land.
- The FireSmart program is introduced in 2002 to promote awareness and education aimed at reducing risk of loss of life and property from fire in the wildland/urban interface.
- The Alberta Land Stewardship Act (2009) requires consideration of all environmental factors, including water, wildlife, and air when managing Alberta's forests.

Activity 2a Handout - ANSWER KEY

Historical and Modern Patterns of Use In The Forest

So, you've reviewed the Forestry Timeline. You've been a busy beaver!

For this activity, place the "event" in the time-period it occurred.



Pre-European Settlement	1700s	1800s	1900 - 1940s	1950 - 1980s	1990s - Present
<i>F</i>	<i>D</i>	<i>A</i>	<i>E</i>	<i>B</i>	<i>C</i>
<i>H</i>	<i>K</i>	<i>G</i>	<i>I</i>	<i>J</i>	<i>L</i>

Events

- A** Alberta's first powered sawmill opens its doors.
- B** Alberta's first Forest Management Plan is created.
- C** Detailed Forest Management Plans are made mandatory for all public areas before harvest can occur.
- D** The fur industry realizes the importance of forest management in protecting its economic interests.
- E** Alberta takes over ownership and responsibility of provincial forests from the federal government.
- F** Indigenous Peoples become Alberta's original forest managers.
- G** The Crown Timber Act grants businesses harvesting rights on Crown land.
- H** The first humans arrive in Alberta, using trees for heat, cooking, and shelter.
- I** The Alberta government tells companies they must replant trees in the forests they harvest.
- J** The beginning of large-scale (industrial) forestry in Alberta.
- K** European settlers move to Alberta, with little concern for forest conservation.
- L** The FireSmart program is created to educate Albertans about the dangers of wildfire where communities border natural environments.

Activity 2b Class Discussion Guide - ANSWER KEY

Changing Attitudes. Forward Progress.

Choose one or more of the topics below and discuss how practices have evolved, the reasons why, and what the impacts may be. Provide students with the corresponding handout.



Topic 1: Changes in Environmental Stewardship

From early on, humans have understood the importance of managing forests. Over the years, rules and regulations have become increasingly stringent. Why is it so important to manage forests in a sustainable manner?

Points for discussion:

1. What was the main reason Indigenous Peoples protected and managed the forests? What about fur traders?

Indigenous Peoples relied on the animals that lived in the forests for food and used the forest as a source of medicines. Fur traders wanted to ensure healthy populations of the animals they depended on for their livelihoods.

2. What are some reasons we manage forests today?

There are several reasons, including: ensuring the long-term sustainability of trees as a renewable resource, protecting the environment (trees provide oxygen and capture carbon dioxide), maintaining space for recreational activities (camping, hunting, hiking), preserving and protecting species and their natural habitats, and protecting waterways.

3. Many of the efforts to encourage sustainability have been introduced by government. Others by the forest sector. Why is it important they work together?

It is in the interest of all Albertans to maintain a healthy forest as it provides jobs, products, clean air and water, and a place for recreation. Working together helps ensure that multiple perspectives are considered and that all involved parties are held accountable.

Changing Attitudes. Forward Progress.

Topic 2: Changes in Wildfire Management

In the spring of 2016, a devastating forest fire ravaged the city of Fort McMurray. Known as “The Beast”, it is the costliest disaster in Canadian history. It is estimated that 90,000 people were evacuated to escape this blaze, which burned an area of over 500,000 hectares, destroyed 2,400 buildings, and resulted in billions of dollars in damages. Discuss how forest fires can threaten communities and what can be done to prevent these disasters.

Points for discussion:

1. How did the forest fire impact the people of Fort McMurray?

The fire impacted residents in numerous ways. People were forced to leave their homes. Many lost their homes, including valuables and keepsakes. Several businesses burned down and jobsites temporarily closed, putting people out of work. People had to deal with emotional challenges and stress.

2. How did the fire affect the economy? Who pays for fires?

Businesses closed or were damaged. The provincial and federal governments have contributed billions of dollars toward relief and rebuilding efforts – paid by taxpayers. Many people generously donated to help out.

3. What types of things can be done to prevent the spread of wildfire caused by human activity?

Fire prevention begins with education. Penalties for burning without a permit or leaving campfires unattended deter dangerous behavior. Thinning and pruning flammable vegetation helps, as does building fire breaks between forests and communities.

Changing Attitudes. Forward Progress.

Topic 3: Changes in Production Practices

Over the course of the timeline, we've seen how methods of harvesting trees and producing wood products have evolved from cutting down trees with saws to the use of heavy equipment and high speed mills. What are the impacts of this change?

Points for discussion:

1. How has technology made it easier to harvest trees and mill wood products to meet growing demand for forest products?

Over time, there have been great improvements in technology and automation that allow us to harvest more trees, faster, and with greater efficiency. Modern mills can use almost every part of the tree, reducing waste and contributing to sustainability. Remote areas can be accessed by building roads accessible to modern logging equipment.

2. What is the impact on the economy? Why is it important that increased production go hand-in-hand with increased management and regulation?

As the population grows, so too does the need for wood products. The increased demand creates jobs and contributes to economic growth. Yet we cannot simply harvest as many trees as we wish. In order to ensure the forests are sustainable and are able to replenish what we take, careful planning is required. Government plays a key role in setting harvest limits, replanting requirements, and ensuring everyone follows the rules.

Lesson Plan 3: Forest Issues and Management

Course

Grade 6 Science: Trees and Forests

Time

70-85 Minutes (suggest splitting over two classes)

Assessment

Activity 3a Summative: Mark students answers to assess comprehension.

Overview

Students will explore the complexities of sustainable forest management by examining a forest map and discussing several issues and varying perspectives.

Alberta Curricular Outcomes

Learner Expectation 9: Identify human actions that enhance or threaten the existence of forests.

Learner Expectation 10: Identify an issue regarding forest use, identify different perspectives on that issue, and identify actions that might be taken.

Materials

- Work Wild Interactive Map found in the *Education Resources* section of the website.
<http://workwild.ca/classroom-resources/student-activities/activity-3-forest-issues-and-management-interactive-map/>
- Toolkit Activity 3 Handout/Discussion Guide - Students can either download these activity sheets online or be provided with hard copies. Blank activity sheets are included at the end of this package for printing/photocopying.

Activity

As a class or individually, students will explore the map and learn about various forest issues and considerations.

Activity 3a: Let's Explore The Forest

(Map Activity) 40-45 minutes

Students will answer handout questions based on content found in the map. It can either be led by the teacher on a SMART Board, done individually, or in small groups using computers (depending on resource availability). Students will use their answers as a resource for the class discussion in the next activity.

Activity 3b: Around the Campfire

(Class Discussion) 30-40 minutes

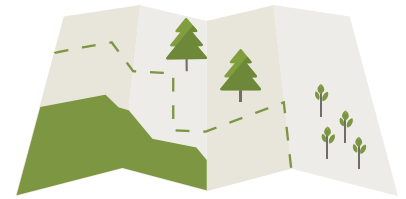
Gather 'round in a circle for a campfire discussion. Choose one or more of the topics provided and lead a class discussion. These topics are a good way to wrap up the unit to test cumulative knowledge and understanding of concepts. Students may continue to fill in any gaps on their Activity 3a handouts during discussion, and will hand in handouts for marking at the end of the activity.



Activity 3a Handout - ANSWER KEY

Let's Explore the Forest

No hiking boots or compass required! All you'll need is your trusty map of Greenville Forest. Use it as your guide to answer the following questions on forest issues and forest management.



1

What sorts of professions are found in the forest sector? Why is it important that people have jobs?

Professions include foresters, wildlife biologists, hydrologists, tree planters, equipment operators, truck drivers, engineers, chemists, skilled tradespeople, and labourers.

People need jobs to pay for food, housing, furniture, electricity, heat, cars/gas, schooling, entertainment, vacations, etc.

Where to find on the map: Mill, logging truck, biologist, tree planter, logging truck, feller buncher

2

Give examples of ways people enjoy the forest for recreation. Why is it important that these needs be considered?

Recreational uses include hiking, camping, bird watching, off-road activities, fishing, and hunting.

People can make a connection to nature and get exercise. Many studies show that spending time in nature reduces stress and improves mental health.

Where to find on the map: Campfire, hiker

3

What are some traditional uses of the forest and why is it important that they be considered?

Hunting, fishing, trapping, food, and medicine.

First Nations and Métis Peoples may have a cultural connection to the forest.

Where to find on the map: Fisher

4

Why do we harvest trees?

Trees are used to produce several products we rely on. This includes building materials, paper, fuel, and even plastics. Removing old trees can help prevent the spread of fire, disease, and pests, which older trees are more susceptible to. Removing old trees also allows the forest to regenerate, making way for younger trees to establish and grow.

Where to find on the map: Feller buncher, pine beetle, fire

Activity 3a Handout - ANSWER KEY Continued

5

List two ways forest companies ensure that trees remain abundant in the forest.

Forest management plans, regulating harvest, and tree planting.

Where to find on the map: Tree planters

6

Why is it important that our forests have trees of varying ages?

Younger trees produce more oxygen and tend to fight off pests and disease better than older trees. Different animals thrive in forests of different ages. Older trees tend to be larger and make better wood products, yet it is important to always have progressively younger trees in place to continue the growth cycle.

Where to find on the map: Young forest, middle-aged forest, old forest

7

Why is it important to have several species of trees in a forest?

Certain diseases and pests can spread and do extensive damage to a species. For example, if we only had pine trees in Alberta, the Mountain Pine Beetle could potentially wipe out the entire forest.

Where to find on the map: Deciduous and coniferous trees side by side

8

Name some animals that prefer to live in:

- a) a young forest
- b) a middle-aged forest
- c) an old forest

- a) Deer, moose, bears, foxes, and beavers*
- b) Rabbits, squirrels, chipmunks, wolves, and skunks*
- c) Owls, woodpeckers, cougars, caribou, and wolverines*

Where to find on the map: Animal icons

9

Are wildfires good or bad? Why?

Wildfires can be both good and bad.

Good: Fire renews the forest, clearing space where new trees can access sunlight and nutrients. They also open pine cones so they can spread seeds. Ash from fire acts as a fertilizer for the soil, facilitating new growth. Fires prevent the forest from getting too old, limiting widespread pests and disease.

Bad: Fires can also be very dangerous. They can threaten lives of people and wildlife, as well as homes and communities.

Where to find on the map: Flames

10

What considerations do forestry companies have to make about water when harvesting?

A buffer is required between harvested areas and bodies of water. The reason is that trees hold and purify water. Forestry companies also use water in their operations, and this water must be cleaned before it is returned to the river it came from.

Where to find on the map: Bodies of water, water drop by mill

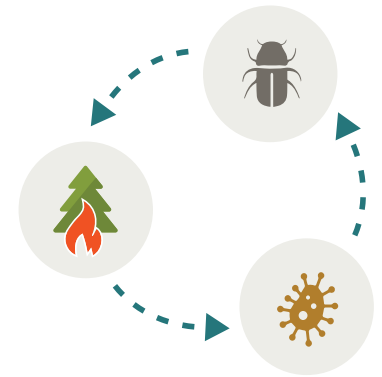
Activity 3b Around the Campfire Class Discussion Guide - ANSWER KEY

Forest Issues and Management

Welcome to CAMP IGIVEAHOOT! The campers in your class have been busy exploring the forest. Gather in a circle around the campfire to discuss all you've learned over this lesson, and unit. Three discussion topics have been provided below.

No bug spray necessary. Marshmallows optional!

Note: An Activity 3b discussion guide is provided for students to reference the questions during the discussion (optional). Students may fill in gaps in Activity 3a handout during this class discussion.



Topic 1: Mountain Pine Beetle

There are lots of pine trees in the forest near Greenville. Forest scientists have noticed that some of the trees in that area have been infested with the Mountain Pine Beetle. The beetle tends to attack older pine trees (80+ years) because they are no longer strong enough to defend themselves. The beetle can spread very quickly, killing many trees.

Points for discussion:

1. Identify which areas on our map would be most vulnerable to pine beetles.

Old forests

2. If all pine trees died, who would be affected?

Many animals would be displaced. The loss of trees would affect recreation users. It could also impact those who rely on forestry to make their living.

3. What can be done to stop the spread of the pine beetle?

Tailoring harvest plans to select older pine stands that are susceptible to the spread of the pine beetle. This can also be achieved through prescribed burns.

Forest Issues and Management

Topic 2: Sustainable Forestry

“Sustainable forestry” means that we do not remove more trees from the forest than can be actively replaced (accounting for the time trees take to regrow). This is essential to maintaining a healthy ecological balance.

Points for discussion:

1. What factors do you think a forest planner needs to consider when developing a plan for which parts of the forest to harvest?

When developing a plan, the forest planner considers the impact harvest would have on: plants, wildlife, and other organisms (such as fungi), nearby water bodies (such as rivers and lakes), and human uses (such as recreation and traditional uses). Decisions are also based on cut quotas (how many trees can be sustainably harvested) and which trees to harvest (old sections vs. new growth).

Forest Issues and Management

Topic 3: Wildfire Management

Greenville is a town that is surrounded by forest. Last year there was a wildfire that came close to the town and threatened the safety of people and their homes. It did not spread into the town, but with plenty of dry deadfall among the trees nearby, the townspeople are nervous that another wildfire could be much worse.

Points for discussion:

1. What can be done to prevent a future wildfire from spreading into Greenville? What steps can be taken to keep people safe?

Greenville can be proactive in preventing wildfire from threatening the town. Steps include clearing deadfall, following the FireSmart Plan (discussed in Lesson 2: Timeline), monitoring fire/weather conditions from lookout towers, educating people about dangers of fire (putting out campfires, not playing with matches, respecting fire bans, etc.). Wildland firefighters and others who work in wildfire management can be trained and ready to manage fires when they start. As well, the townspeople can carefully plan to ensure there are adequate escape routes (bridges and roadways) to allow residents to leave in the event of a fire threat.

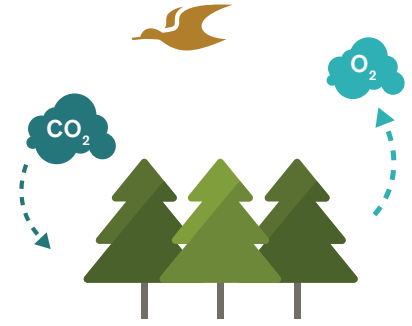
Student Handouts

Activities 1-3

Activity 1 Handout

Part 1: The Forest Ecosystem

Once you have watched Part 1: *The Forest Ecosystem*, harvest your new-found knowledge to answer the following questions.



1 Trees absorb carbon dioxide and produce oxygen. They also make food for themselves. What is this process called?

2 Healthy, growing forests absorb and store more carbon dioxide than they release. Scientists use the term _____ to describe this.

3 Which absorbs more carbon dioxide and produces more oxygen: younger or older trees?

4 Trees help keep our water clean. What part of the tree filters rainwater and melted snow to remove silt and other impurities?

5 Other than trees, name two lifeforms that depend on the forest.

Part 2: Human Values of the Forest

If you go down to the woods today, you're in for... a quiz! Based on Part 2: *Human Values of the Forest*.

1 List three reasons that people use the forest.

2 How many seedlings are planted in Alberta each year?

3 What are two jobs related to the forest?

Part 3: Land-use Planning

Chop, chop! Let's see who knows the answer... based on Part 3: *Land-use Planning*.

- 1** Who owns the Crown forests in Canada?
- 2** In Alberta, before a forestry company can harvest trees, what does the government require them to create?
- 3** Name two things forestry companies must consider when making forest management plans?

Part 4: People and Products

Can you root out the answers to the following questions? Based on Part 4: *People and Products*.

- 1** Name three forest products:
- 2** Which insect is causing problems in British Columbia and Alberta's pine forests?
- 3** How many people work in Alberta's forest sector?

Activity 2a Handout

Historical and Modern Patterns of Use In The Forest

So, you’ve reviewed the Forestry Timeline. You’ve been a busy beaver!
For this activity, place the “event” in the time-period it occurred.



Pre-European Settlement	1700s	1800s	1900 - 1940s	1950 - 1980s	1990s - Present

Events

- A

Alberta’s first powered sawmill opens its doors.
- B

Alberta’s first Forest Management Plan is created.
- C

Detailed Forest Management Plans are made mandatory for all public areas before harvest can occur.
- D

The fur industry realizes the importance of forest management in protecting its economic interests.
- E

Alberta takes over ownership and responsibility of provincial forests from the federal government.
- F

Indigenous Peoples become Alberta’s original forest managers.
- G

The *Crown Timber Act* grants businesses harvesting rights on Crown land.
- H

The first humans arrive in Alberta, using trees for heat, cooking, and shelter.
- I

The Alberta government tells companies they must replant trees in the forests they harvest.
- J

The beginning of large-scale (industrial) forestry in Alberta.
- K

European settlers move to Alberta, with little concern for forest conservation.
- L

The FireSmart program is created to educate Albertans about the dangers of wildfire where towns and cities border natural environments.

Activity 2b Class Discussion Guide

Topic 1: Changes in Environmental Stewardship

From early on, humans have understood the importance of managing forests. Over the years, rules and regulations have become increasingly stringent. Why is it so important to manage forests in a sustainable manner?

1. What was the main reason Indigenous Peoples protected and managed the forests? What about fur traders?

2. What are some reasons we manage forests today?

3. Many of the efforts to encourage sustainability have been introduced by government. Others by the forest sector. Why is it important they work together?

Topic 2: Changes in Wildfire Management

In the spring of 2016, a devastating forest fire ravaged the city of Fort McMurray. Known as “The Beast”, it is the costliest disaster in Canadian history. It is estimated that 90,000 people were evacuated to escape this blaze, which burned an area of over 500,000 hectares, destroyed 2,400 buildings, and resulted in billions of dollars in damages. Discuss how forest fires can threaten communities and what can be done to prevent these disasters.

1. How did this forest fire impact the people of Fort McMurray?

2. Did the fire affect the economy? Who pays for fires?

3. What types of things can be done to prevent the spread of wildfire caused by human activity?

Topic 3: Changes in Production Practices

Over the course of the timeline, we've seen how methods of harvesting trees and producing wood products have evolved from cutting down trees with saws to the use of heavy equipment and high speed mills. What are the impacts of this change?

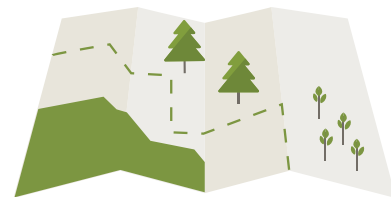
1. How has technology made it easier to harvest trees and mill wood products to meet growing demand for forest products?
-

2. What is the impact on the economy? Why is it important that increased production go hand-in-hand with increased management and regulation?
-

Activity 3a Handout

Let's Explore the Forest

No hiking boots or compass required! All you'll need is your trusty map of Greenville Forest. Use it as your guide to answer the following questions on forest issues and forest management.



1

What sorts of professions are found in the forest sector? Why is it important that people have jobs?

2

Give examples of ways people enjoy the forest for recreation. Why is it important that these needs be considered?

3

What are some traditional uses of the forest and why is it important that they be considered?

4

Why do we harvest trees?

Activity 3a Handout Continued

5

List two ways forest companies ensure that trees remain abundant in the forest.

6

Why is it important that our forests have trees of varying ages?

7

Why is it important to have several species of trees in a forest?

8

Name some animals that prefer to live in:

a) a young forest

b) a middle-aged forest

c) an old forest

9

Are wildfires good or bad? Why?

10

What considerations do forestry companies have to make about water when harvesting?

Activity 3b Class Discussion Guide

Topic 1: Mountain Pine Beetle

There are lots of pine trees in the forest near Greenville. Forest scientists have noticed that some of the trees in that area have been infested with the Mountain Pine Beetle. The beetle tends to attack older pine trees (80+ years) because they are no longer strong enough to defend themselves. The beetle can spread very quickly, killing many trees.

1. Identify which areas on our map would be most vulnerable to pine beetles.

2. If all pine trees died, who would be affected?

3. What can be done to stop the spread of the pine beetle?

Topic 2: Sustainable Forestry

“Sustainable forestry” means that we do not remove more trees from the forest than can be actively replaced (accounting for the time trees take to regrow). This is essential to maintaining a healthy ecological balance.

.....

1. What factors do you think a forest planner needs to consider when developing a plan for which parts of the forest to harvest?
-

Topic 3: Wildfire Management

Greenville is a town that is surrounded by forest. Last year there was a wildfire that spread close to the town and threatened the safety of people and their homes. It did not spread into the town, but with plenty of dry deadfall among the trees nearby, the townspeople are nervous that another wildfire could be much worse.

1. What can be done to prevent a future wildfire from spreading into Greenville? What steps can be taken to keep people safe?