

the
IDAHO FOREST



FROM LUMBERJACKS TO LASERSAWS
TEACHER GUIDE

The Idaho Forest: From Lumberjacks to Lasersaws Teacher Guide

Dear Idaho teacher,

Welcome to The Idaho Forest: From Lumberjacks to Lasersaws.

What is it? This is a supplement to the study of Idaho history. It focuses on Idaho's forests and forest industry. While aimed at fourth grade classrooms, teachers of other grades may find it useful for teaching geography and Idaho history. This FREE resource is provided to you by the Idaho Forest Products Commission (IFPC).

How do I use it? Provide each student with a Student Reader. (Contact IFPC for additional copies.) The Student Reader has four sections:

- 1) King Pine (Student Reader, pages 1-3)—about the western white pine, our state tree.
- 2) Forest Digest (Student Reader, pages 4-7)—about Idaho forest geography and ownership.
- 3) Tools of the Trade (Student Reader, pages 8-9)—about historic and modern forest technology.
- 4) People and Idaho's Forests (Student Reader, pages 10-13).

This Teacher Guide, divided into the above four sections, contains background information, lesson plans, glossary, reproducible student pages, and overhead transparency maps. Lessons may be used in sequence as a unit, or you may select individual items that fit a particular need. This teaching tool is flexible, and meant to be used in the way that works best for you.

What subjects are included? Social Studies, Mathematics and Language Arts are emphasized. Correlations to 4th grade Idaho Content Standards are on pages 4-6 of this Teacher Guide.

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For additional resources, such as photos, extensive information about Idaho's forests, and online order forms for printed materials and videos/DVDs, please visit www.idahoforests.org.

Sincerely,

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Teacher Guide

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Correlation to Idaho Content Standards

KEY

S1=Reader 1, King Pine

S2=Reader 2, Forest Digest

S3=Reader 3, Tools of the Trade

S4=Reader 4, People and Idaho's Forests

L1, L2, etc. = Lesson 1, Lesson 2 corresponding to the reader.

E=Enrichment

Example: S2L2 = Lesson 2 of Section 2, Forest Digest.

Standard number, goals and objectives	S1 L1	S1 L2	S1 L3	S1 E	S2 L1	S2 L2	S2 L3	S3 L1	S3 L2	S3 L3	S4 L1	S4 L2	S4 L3	S4 L4
LANGUAGE ARTS														
Standard 1: Reading Process														
<i>Goal 1.2. Acquire Concepts About Text</i>														
Objective	4.LA.1.2.2 Use text features (e.g. heading, captions) to comprehend various print formats (e.g. newspapers, reference text).	•				•		•			•	•		
Objective	4.LA.1.2.3 Identify and use graphic features that support text meaning (e.g., diagrams, maps, charts, illustrations).					•	•	•			•	•		•
<i>Goal 1.8. Vocabulary and Concept Development</i>														
Objective	4.LA.1.8.3 Use words and concepts necessary for comprehending math, science, social studies, literature and other Grade 4 content area text.	•				•	•	•	•		•	•		•
Objective	4.LA.1.8.4 Use a grade-level appropriate dictionary and glossary to define and confirm meaning of unknown words.					•					•	•		
Standard 2: Comprehension/Interpretation														
<i>Goal 2.1. Acquire Strategies and Skills for Comprehending Text</i>														
Objective	4.LA.2.1.3 Draw conclusions based on information gathered from text.	•	•					•	•		•	•		
<i>Goal 2.2. Acquire Skills to Comprehend Expository Text</i>														
Objective	4.LA.2.2.4 Follow multi-step written directions.		•				•		•	•				
Standard 3: Writing Process Depending on how the teacher approaches the writing assignments, Goals 3.1-3.4 (prewriting; writing, revising and editing a draft) may be addressed in these activities.														
Standard 4: Writing Application														
<i>Goal 4.3. Acquire Persuasive Writing Skills</i>														
Objective	4.LA.4.3.1 Write a persuasive letter that states and supports a position.		•										•	
Standard 6: Communications														
<i>Goal 6.3. Acquire Viewing Skills</i>														
Objective	4.LA.6.3.2 Demonstrate understanding of graphics, pictures and charts appropriate to grade level.					•	•				•			•

Standard number, goals and objectives		S1 L1	S1 L2	S1 L3	S1 E	S2 L1	S2 L2	S2 L3	S3 L1	S3 L2	S3 L3	S4 L1	S4 L2	S4 L3	S4 L4
MATHEMATICS															
Standard 1: Number and Operation															
<i>Goal 1.1. Understand and use numbers.</i>															
Objective	4.M.1.1.6 Select strategies appropriate for solving a problem.			•	•		•			•	•			•	•
Objective	4.M.1.1.7 Use appropriate vocabulary.			•			•			•	•			•	
<i>Goal 1.2. Perform computations accurately.</i>															
Objective	4.M.1.2.1 Recall multiplication facts through 10 x 10.						•		•	•					
Objective	4.M.1.2.2 Add and subtract whole numbers.			•						•					•
Objective	4.M.1.2.3 Multiply up to two-digit by two-digit whole numbers and divide whole numbers by one-digit divisors.						•		•	•	•			•	
Objective	4.M.1.2.6 Select and use an appropriate method of computation from mental math, paper and pencil, calculator, or a combination of the three.			•			•		•	•	•			•	•
Objective	4.M.1.2.7 Select and use appropriate operations to solve word problems and show or explain work.						•		•	•	•			•	
Objective	4.M.1.2.8 Use appropriate vocabulary.						•		•	•	•			•	
Standard 2: Concepts and Principles of Measurement															
<i>Goal 2.1. Understand and use U.S. customary and metric measurements.</i>															
Objective	4.M.2.1.1 Select and use appropriate units and tools to make the formal measurements of length, temperature and weight in both systems.				•		•								
Objective	4.M.2.1.2 Estimate length, time, weight and temperature in real-world problems using standard units.				•		•								
Standard 3: Concepts and Language of Algebra and Functions															
<i>Goal 3.1. Use algebraic symbolism as a tool to represent mathematical relationships.</i>															
Objective	4.M.3.1.1 Write a division problem using a bracket and/or the division symbol.								•	•					
Standard 5: Data Analysis, Probability, and Statistics															
<i>Goal 5.1. Understand data analysis.</i>															
Objective	4.M.5.1.1 Read and interpret simple tables, charts, bar graphs and line graphs.			•						•					•
Objective	4.M.5.1.2 Use appropriate vocabulary.														•
<i>Goal 5.5. Make predictions or decisions based on data.</i>															
Objective	4.M.5.5.1 Make predictions based on data.			•											•

Standard number, goals and objectives		S1 L1	S1 L2	S1 L3	S1 E	S2 L1	S2 L2	S2 L3	S3 L1	S3 L2	S3 L3	S4 L1	S4 L2	S4 L3	S4 L4
SOCIAL STUDIES															
Standard 1: History															
<i>Goal 1.2. Trace the role of migration and immigration of people in the development of the United States.</i>															
Objective	4.SS.1.2.1 Identify the major groups and significant individuals and their motives in the western expansion and settlement in Idaho.												•		
Standard 2: Geography															
<i>Goal 2.1. Analyze the spatial organizations of people, places and environment on the earth's surface.</i>															
Objective	4.SS.2.1.1 Use geographic skills to collect, analyze, interpret and communicate data.		•			•									
<i>Goal 2.3. Trace the migration and settlement of human populations on the earth's surface.</i>															
Objective	4.SS.2.3.3 Identify the geographic features of Idaho.					•	•						•		
Standard 3: Economics															
<i>Goal 3.1. Explain basic economic concepts.</i>															
Objective	4.SS.3.1.5 Explain the concept of public and private property in the development of Idaho.								•						
<i>Goal 3.2. Identify different influences on economic systems.</i>															
Objective	4.SS.3.2.1 Describe examples of technological innovations in relation to economic growth in Idaho.									•	•				
Standard 4: Civics and Government															
<i>Goal 4.2. Build an understanding of the organization and formation of the American system of government.</i>															
Objective	4.SS.4.2.1 Explain the significance of Idaho symbols.		•											•	

Teacher Guide for Section 1, King Pine (pages 1-3, Student Reader)

Background

The western white pine's scientific name, *Pinus monticola*, means "pine of the mountains." The tree grows in moist forests of the Inland Northwest, at elevations of 2,000 to 6,000 feet, in areas receiving at least 30 inches of precipitation per year. In Idaho, the tree is found north of the Salmon River.

Young white pine trees require a lot of sun in order to grow rapidly. They do best in openings in the forest. Other trees such as hemlock, redcedar, and grand fir are shade-tolerant. They can thrive in denser, shaded conditions. Forest openings, crucial to the white pine's regeneration (reproduction), are created when trees die or are removed by the combined effects of age, fire, disease, and logging.

For centuries, white pine dominated the forests of northern Idaho. It is fast-growing (2-4 feet in height per year) and long-lived (250-400 years). Well-adapted to regenerate quickly after forest fires, white pine can outgrow the shade-tolerant species, and subsequently outnumber its competitors.

White pine was highly valued in the Inland Northwest for its clear, light, straight-grained, and easily milled wood. A mature white pine has very few lower branches, making its wood knot-free and further adding to its value as lumber. White pine wood was used for everything from construction lumber to match sticks. (During the heyday of white pine lumbering, up to 40% of the white pine harvested was used to make wooden matches.) It is particularly suitable as siding, paneling, and milled products such as window sashes, doors, blinds, and more recently, furniture.

At the turn of the 20th century, the supply of this prized wood seemed endless. In 1891 Congress passed the Forest Reserve Act, by which the federal government could reserve forest lands. In 1905 President Theodore Roosevelt established the U.S Forest Service, which took over management of the forest reserves (now national forests). One of this agency's duties was to suppress forest fires. In conjunction with the firefighting efforts of timber companies, and the advent of more advanced technology, fire was practically eliminated from an ecosystem that depends on fire to renew the forest cycle.

The first forty years of the 20th century were the "glory days" of white pine harvesting in Idaho. As one source puts it, they were the days of "big trees, big men, and big money." Between 1900 and 1965, mills in the Coeur d'Alene region alone produced over 17.5 billion board feet of lumber, most of it white pine. ("Board foot" is a volume measurement. A piece of wood measuring 12 inches by 12 inches by 1 inch contains one board foot—144 cubic inches. A piece of wood 6 inches by 6 inches by 4 inches also contains one board foot.)

In 1910 a tree grower in British Columbia shipped white pine seeds to France to have them raised to seedlings. While in France, the seedlings became infected with a Siberian tree fungus known as blister rust before being sent back to B.C. The blister rust fungus quickly spread, infecting huge areas of North America's white pine forests. By 1940 millions of white pines were dying, despite valiant attempts by the U.S. Forest Service and private industry to save them.

Although Idaho's white pine forests have been reduced by more than 90%, there is hope that the tree can regain its prominence. In the 1950s, Richard T. Bingham discovered white pines that resisted blister rust. A breeding orchard at the University of Idaho began producing rust resistant white pine seeds. Since 1970, the orchard has produced hundreds of millions of seeds. Since 1976, over a quarter of a million acres have been planted with rust-resistant white pine. The Inland Empire Tree Improvement Cooperative supports a program to increase the white pine's genetic resistance to blister rust, produce other resistant materials such as pollen, seeds, and cuttings, and distribute these to public and private forest management organizations.

This research and breeding program, along with scientifically-improved logging practices and the return of natural forest fire, can help restore the "King Pine," which was designated Idaho's state tree in 1935, to its place in the forests of Idaho and the Inland Northwest. The story of the white pine, its value, decline, and the efforts made to restore it, is a story worth telling.

King Pine, Lesson One. The life and times of Western White Pine.

Overview: Students learn about the western white pine, Idaho's state tree, by reading King Pine (pages 1-3 in the Student Reader) and responding to comprehension questions.

Objectives: Students will:

- name and describe Idaho's state tree
- describe the conditions needed to grow western white pine
- discuss challenges faced by the western white pine
- describe white pine blister rust and what it has done to Idaho's forests
- describe the role of fire in Idaho's white pine forests
- describe efforts being made to restore western white pine in Idaho's forests

Materials: Student Reader pages 1-3, Student Pages.

Idaho Content Standards: 4.LA.1.2.2, 4.LA.1.8.3, 4.LA.2.1.2, 4.LA.2.1.3

Answers to Student Page questions.

1. Describe what a western white pine tree looks like.

Tall. Straight. (See pictures on page 1 and page 4 of the Student Reader).

2. The scientific name of the western white pine is Pinus monticola.

a) What does Pinus monticola mean?

Pine of the mountains.

b) Why do you think this name was given to the western white pine?

It grows at higher elevations – 2000-6000 feet.

3. Describe the kind of place in Idaho where a western white pine tree would grow best.

Forests in northern Idaho that receive at least 30" of precipitation per year.

4. Why is the western white pine a good tree to use for lumber?
It grows quickly. It produces a lot of wood. It has a straight grain.
 5. There are not as many western white pine trees in Idaho's forests now as there were 100 years ago. What are some reasons for this?
Fire suppression; blister rust fungus; logging; forest being taken over by trees that "like" shade; not enough sunny, open areas for young white pines.
 6. How did white pine blister rust come to Idaho?
From Canada, which had "imported" infected seedlings from France
 7. What is the role of *Ribes* (currant and gooseberry shrubs) in the blister rust life cycle?
The blister rust spends part of its life on the white pine and part on the Ribes shrubs. It needs both hosts.
 8. Describe one way fire can help a western white pine forest.
A forest fire can create openings in the forest, letting in sunlight, which young white pines require to grow rapidly.
 9. What are scientists doing today to help the western white pine?
Scientists are raising white pine seedlings that can resist the blister rust fungus.
- Bonus question:
10. What else do you think should be done to help the western white pine?
Individual answers will vary.

King Pine, Lesson Two. A good symbol for Idaho.

Overview: Students write a letter about western white pine based on their choice of two writing prompts.

Objectives: Students will:

- describe the western white pine
- justify why the western white pine tree is a good symbol for Idaho
- write a letter to an individual or group
- draw a picture of a western white pine tree

Idaho Content Standards: 4.LA.2.1.3, 4.LA.2.2.4, 4.LA.3, 4.LA.4.1.2, 4.LA.4.3.1, 4.LA.5.1.1, 4.SS.2.1.1, 4.SS.4.2.1, 4.SS.4.2.2, 4.SS.4.3.2.

Materials: Student Reader pages 1-3, Student Page, pen, pencil or word processing program.

King Pine, Lesson Three. The King is growing.

Overview: Students use information in a table to respond to questions.

Objectives: Students will:

- interpret information from a table
- describe the growth of a western white pine tree

Idaho Content Standards: 4.M.1.1.6, 4.M.1.1.7, 4.M.1.2.2, 4.M.1.2.6, 4.M.5.1.1, 4.M.5.2.2, 4.M.5.5.1.

Materials: Student Page

Answers to Student Page questions.

1. How tall was the tree when it was 10 years old?

9 feet

2. How tall was the tree when it was 60 years old?

94 feet

3. How many feet did the tree grow between its 10th birthday and its 100th birthday?

136 feet – 9 feet = 127 feet

4. How old was the tree when its growth began to slow down?

100 years old

Bonus Question

5. How tall do you think the tree will be when it is 200 years old?

Answers will vary. Based on the trend seen in the data, the tree likely won't add much height in the coming years.

King Pine, Enrichment. How big is the King?

Idaho Content Standards: 4.M.1.1.6, 4.M.1.3.2, 4.M.2.1.1, 4.M.2.1.2, 4.M.4.1.1.

Take a large ball of string and a long measuring tape (several if you'd like students to work in small groups) out to the playground or sidewalk.

The height of the largest western white pine in Idaho is 229 feet (69.8 meters). Have students measure and lay out 229 feet (69.8 m) of string to represent the tree's height.

The circumference (distance around the trunk) of the largest western white pine in Idaho is 247 inches (6.3 meters). Have students measure and use the string to form a circle with a 247-inch (6.3 m) circumference.

Ask students to find the diameter (distance across the trunk) of the tree using the circle they made with the string. (78.7 inches, 1.96 m.)

Going further

Have students research the measurements of "big trees" of other Idaho tree species, such as lodgepole pine, ponderosa pine, western larch, and Douglas-fir. Have students use the string and measuring tape to compare these trees to western white pine.

Go to www.cnr.uidaho.edu/extforest/ and click on the "Idaho Big Tree Program" link to get data on Idaho's "Big Trees."

Teacher Guide for Section 2, Forest Digest (pages 4-7, Student Reader)

Background

At 42% of its total land area, Idaho has the largest proportion of forestland in the Inland Northwest, and contains some of its most remote, rugged and varied forests. Most of Idaho's trees are coniferous (cone-bearing). The most common species are (in order of abundance) Douglas-fir, grand fir, lodgepole pine, and ponderosa pine. Each of these species has adapted to various growing conditions in terms of elevation, precipitation, climate and topography, though there is considerable overlap.

Approximately 70% of Idaho is public land (owned by a government on behalf of the citizens). Public land is usually managed by state or federal agencies. Examples are Idaho Department of Parks and Recreation (state) and U.S. Forest Service (federal).

Note: Visit www.idahoforests.org for information on Idaho tree species and discussion of tree parts and their functions.

Forest Digest Lesson 1. Class discussion with map overlays.

Overview: In a class discussion, students compare maps of forest type, precipitation and land ownership. They draw conclusions regarding forests, climate, and land management.

Objectives: Students will:

- interpret information from a variety of maps
- recognize different climates in Idaho
- locate different forest types on a map of Idaho
- discuss the relationship between amount of precipitation and forest type
- Distinguish between public land and private land

Idaho Content Standards: 4.LA.1.2.2, 4.LA.1.2.3, 4.LA.1.8.3, 4.LA.6.3.2, 4.SS.2.1.1, 4.SS.2.3.3, 4.M.1.1.1.

Materials: Map transparencies (Forest Types, Precipitation and Land Ownership), overhead projector, and Student Reader pages 4-7.

Guided class discussion with map overlays

1. Read aloud the descriptions of five forest types in the Student Reader, page 4. Use the Forest Types map transparency for a discussion of the following points:

- How much of Idaho is forested?
(almost half—42%)
- Where in Idaho does our state tree grow?
(Our state tree is the western white pine. It grows in northern Idaho)
- On mountains, the area above the treeline (no trees grow above this “line”) is called “alpine.” What do you think the word “subalpine” tells us about the subalpine fir tree?
(It grows in mountainous areas, just below the treeline.)

2. Use the Annual Average Precipitation map transparency overlaid with the Forest Types map transparency for a discussion of the following points:

- Where are the driest parts of Idaho? Where are the wettest?
- What areas of Idaho are too dry to grow trees?
(Colored white on the Forest Types map)
- Where are most of Idaho's forests located? Why do you think this is?
(Northern Idaho – more moisture)
- What types of forest grow in the drier areas?
(None in the driest. Ponderosa pine and Douglas-fir in some of the drier areas.)
In the wetter areas?
(Western white pine, spruce-fir)

3. Read *Who Owns Idaho Forests?* (page 5 in the Student Reader). Use the Land Ownership map transparency for a discussion of the following points:

- In Idaho, is there more public land or private land?
(There is more public land.)
- Which agency manages the most public land in Idaho?
(The U.S. Forest Service)
- Which agency manages the public land closest to our home?
(Answers will vary.)

4. Overlay the Land Ownership map transparency with the Forest Types map transparency to make the point that most of Idaho's forested land is public land.

Forest Digest Lesson 2. Ultralight trips across Idaho!

Overview: Students plan an imaginary trip to visit two different parts of the state. They use maps to determine forest types and average precipitation in those areas. They also calculate mileage and travel time.

Objectives: Students will:

- list five different forest types
- use a map of Idaho to plan an imaginary trip
- measure distances and calculate the number of miles to visit different communities
- calculate the amount of time needed to visit different communities.

Idaho Content Standards: 4.LA.1.2.3, 4.LA.1.8.3, 4.LA.2.2.4, 4.LA.6.3.2, 4.M.1.1.6, 4.M.1.1.7, 4.M.1.2.1, 4.M.1.2.3, 4.M.1.2.6, 4.M.2.1.1, 4.M.2.1.2, 4.M.1.2.7, 4.M.1.2.8, 4.SS.2.1.1, 4.SS.2.1.3, 4.SS.2.3.3.

Materials: Student Reader pages 4-7, Student Page, colored pencils, ruler, calculator (optional), Idaho road map (optional).

Note: Students will have to estimate placement of St. Maries, McCall and Island Park on the forest types and precipitation maps in the Student Reader.

Forest Digest Lesson 3. Whose land?

Overview: Students read about ownership of Idaho's forestlands and answer comprehension questions.

Objectives: Students will:

- compare public and private land
- explain why forestlands were set aside in the early 1900s
- describe how the national forests were formed
- describe a Wilderness Area

Idaho Content Standards: 4.LA.1.2.2, 4.LA.1.2.3, 4.LA.1.8.3, 4.LA.1.8.4, 4.LA.2.1.3, 4.SS.3.1.5.

Materials: Student Reader pages 4-7, Student Page

Review *Who Owns Idaho Forests?* (Page 5 in the Student Reader). Briefly discuss 1) the differences between public and private land, and 2) the different land management agencies, using the Land Ownership map and pie chart.

Have students read *This Land is Whose Land?* (Pages 6-7 in the Student Reader) and respond to comprehension questions.

Answers to Student Page questions.

1. Name two reasons people came to Idaho in the late 1800s.
Several answers can be gleaned from the readings.
2. a. What is public land?
Land that is managed by a local, state or federal agency.
b. What is private land?
Land owned by a person, family or business.
3. a. When was the Forest Reserve Act passed?
1891.
b. Why was the Forest Reserve Act passed?
People were worried that forests were being used too quickly, and might soon be gone.
4. What did the Forest Reserve Act do?
Set aside public forested land to be managed by the U.S. government.
5. Forest Reserves became National Forests in 1905. Who owns the National Forests?
The people of the United States of America.
6. Who takes care of most of the forestland that belongs to the State of Idaho?
Idaho Department of Lands.
7. When the Idaho Dept. of Lands sells timber from state forestlands, what does the money support?
Public schools (and some other state institutions).
8. Name a private forestland owner in Idaho.
Potlatch Corporation is mentioned in the reading, but students may know of several other correct answers.
9. What is a Wilderness Area?
Federally designated undeveloped land on which roads cannot be built, and all mechanized equipment is prohibited.

Teacher Guide for Section 3, Tools of the Trade (pages 8-9, Student Reader)

Background

Technological advances directly affect the productivity of the forest industry in three main ways: 1) the tools and methods for harvesting trees; 2) transportation of timber from the forests to mills, and then on to markets; 3) the milling process and the production of wood products. The effect of progress in technology is increased production of finished materials, even in the face of decreasing timber harvests.

The stages in the development of forest technology can be summarized into roughly five periods.

1. Pre-settlement - 1850s

Hand-forged tools, such as axes and crosscut saws; logs removed by teams of oxen and horses; small mills produced lumber for local use; some mills powered by water wheels.

2. 1850s - 1900

Improved saws (circular saws) in mills; steam engines to power mills, trains, and ships; log drives and log flumes to remove logs from the forest.

3. 1900 - 1930

Band saws in mills, gasoline-powered trucks, bulldozers and other heavy equipment for log removal, transportation, and fire fighting.

4. 1930s – 1980s

Era of road-building, rapid technological advances, such as the chain saw; use of airplanes and helicopters for timber survey, log removal, and firefighting; the invention of new uses for wood and wood fiber products.

5. 1980s - present

Fully mechanized harvesters and mills, utilizing computer analysis; thin kerf saw blades; new wood products that use wood “waste” and chemicals.

A note about “saw kerf”

Saw kerf, generally speaking, is the width of the path cut by the saw teeth as the saw blade moves through the log. The average saw kerf today is 1/3rd as wide as that of the 1920s. In the 1920's only 40% of a log was converted into lumber. This was due to wide kerf and less accurate sawmilling techniques. Much of the rest ended up as sawdust, which was burned as “waste.”

Today, about 60% of the useable wood becomes lumber. (This number is lower than expected because the average logs being milled today are much smaller than in the past.) The remaining wood chips and sawdust are used completely– in products such as paper and particleboard, or burned to provide energy to run the sawmill.

Tools of the Trade, Lesson One. Cutting Trees Then and Now.

Overview: Students compare differences in harvesting methods and calculate forest yields for three different time periods.

Objectives: Students will:

- use multiplication and division skills to calculate number of trees harvested
- compare forest productivity in three different eras

Idaho Content Standards: 4.LA.1.8.3, 4.LA.1.8.4, 4.LA.2.1.3, 4.LA.2.2.4, 4.M.1.2.1, 4.M.1.2.3, 4.M.1.2.6, 4.M.1.2.7, 4.M.1.2.8, 4.M.3.1.1, 4.SS.3.2.1.

Materials: Student page, calculator

Answers to Student Page questions.

1. The year is 1890. Suppose it takes two sawyers using axes and a crosscut saw two hours to cut down one tree. If they work for 10 hours, how many trees will they cut in a day?

10 hours/2 hours per tree = 5 trees.

2. Now it is 1960. Suppose it takes one sawyer using a chainsaw one hour to cut six trees.

How many trees can two sawyers cut down in a 10-hour work day?

One sawyer cuts six trees per hour. S/he could cut 60 trees in 10 hours. Two sawyers working at that rate would cut 120 trees in 10 hours.

3. Fast forward to today! Suppose one person operating a modern harvester can cut 200 times as many trees in a day as two sawyers in 1890. How many trees could today's sawyer cut down in 10 hours?

According to the information in Question 1, two sawyers cut five trees per day. $200 \times 5 = 1000$ trees.

4. What other information could affect the number of trees cut in a day?

The size of the trees. (Trees cut in the past were bigger than most of the trees cut now.)

Slope of the hillside. Time of year. Weather/soil conditions.

Tools of the Trade, Lesson Two. Sawdust: Waste or Not?

Overview: Students visualize and calculate the “kerf” of two different sizes of saw blades, and the differences in wood waste produced.

Objectives: Students will:

- use multiplication, division and subtraction skills to calculate how much wood is lost to sawdust using two different saw kerfs
- compare the efficiency of saws from the past with modern saws

Idaho Content Standards: 4.LA.2.2.4, 4.M.1.1.6, 4.M.1.1.7, 4.M.1.2.1, 4.M.1.2.2, 4.M.1.2.3, 4.M.1.2.6, 4.M.1.2.7, 4.M.1.2.8, 4.M.3.1.1, 4.SS.3.2.1.

Materials: Student Reader pages 8-9, Student Pages, calculator (optional)

Answers to Student Page questions:

1. How many cuts will you have to make to saw the cant into five boards?

Four cuts are required to make five boards.

2. How much wood will end up as sawdust when you cut the cant into five boards?

4 cuts x 1/2 inch of sawdust per cut = 2 inches.

3. How thick will each board be?

12 inches – 2 inches of sawdust = 10 inches of wood.

10 inches of wood divided by 5 boards = 2 inches per board.

4. How much wood will end up as sawdust when you cut the cant into five boards?

4 cuts x 1/4 inch of sawdust per cut = 1 inch.

5. Compare the amount of sawdust made with today’s saw to the amount of sawdust made with your 1890 saw.

Today’s saw: 1 inch of sawdust. 1890 saw: 2 inches of sawdust. The current saw makes half as much sawdust as the 1890 saw. (Or, the 1890 saw made twice as much sawdust as the modern saw.)

Teacher Guided Questions

6. How much wood will be lost with your modern saws (with a 1/4” kerf)? Give your answer in inches, then in feet.

1 inch of sawdust x 3000 logs = 3000 inches of sawdust.

3000 inches / 12 inches per foot = 250 feet of wood wasted. (This sawdust gets used in other products or as fuel for energy.)

7. How much wood will be lost using the 1890 saw (with a 1/2” kerf)? Give your answer in inches, then in feet.

2 inches of sawdust x 3,000 logs = 6,000 inches of sawdust.

6000 inches / 12 inches per foot = 500 feet of wood wasted.

8. By using the modern saw with a smaller kerf, how much wood will you save on 3000 logs?

500 feet of waste (old saw) – 250 feet of waste (new saw) = 250 feet of wood saved.

Tools of the Trade, Lesson Three. Technology through time.

Overview: Using information from the reader and their knowledge and intuition, students will match forest technology items with their appropriate place in a timeline grid.

Objectives: Students will:

- consider the changes in forest technology over time.
- place forest technology items in appropriate places in a grid.

Idaho Content Standards: 4.LA.1.2.2, 4.LA.1.2.3, 4.LA.1.8.3, 4.LA.1.8.4, 4.LA.2.1.3, 4.LA.6.3.2, 4.M.5.1.1, 4.M.5.2.1.

Materials: Student Reader pages 8-9, Student Page.

Completed table

(Some squares have more than one potential correct answer. Students are expected to record one correct answer per square.)

	1800s	Mid-1900s	Today
Harvesting (cutting) trees	Cross cut saw	Chain saw	Cut-to-length harvester
Transporting logs from forest to mill	Horse, oxen	Log drive on river, Railroad	Log truck
Sawmilling	Steam-powered saw	Band saw	Thinner kerf saw blade. Computers. Lasers.
Managing forests	No planting	Fire suppression (putting out fires)	Planting trees for the future. Putting out some forest fires. Letting some forest fires burn.
Dealing with sawdust "waste" from sawmills	Open burning	Tepee burner	Made into paper, Burned to make electricity, Made into particle board and other wood products

Teacher Guide for Section 4, People and Idaho's Forests (pages 10-13, Student Reader)

Background

NOTE: This is the same information included in the Student Reader, pages 10-13.

People have appreciated Idaho's forests for hundreds of years. Native Americans hunted and gathered food in the forest. Early explorers and settlers needed wood to survive. As America grew, its people needed even more lumber and wood. Businessmen built sawmills to make lumber. Other kinds of mills made other wood products. Many people had jobs in the forest industry. Forest workers also cared for our forests, including fighting fires.

Native Americans and the Land (before 1805)

The Shoshoni, the Kootenai, the Nez Perce, and other native people hunted, fished, and gathered food from the land. They were active land managers and often set fires to allow grass to grow for their horses and to grow forest crops.

The Discovery Days (1805 - 1890)

The 1805 journals of Lewis and Clark show that they used Idaho's trees. They made campfires and built dugout canoes for their journey to the Pacific Ocean. Native Americans had done this for centuries.

The Oregon Trail brought settlers to Idaho. In 1840 missionary Henry Spalding started a settlement near what is now Lewiston. He built a water-powered sawmill to provide lumber to help build a community. This was the first sawmill in Idaho.

Many people came in the mid-1800s. Gold had been discovered here. By 1868, the Idaho territory was the shape that the state is today. The population was less than twenty thousand people. This changed quickly as railroads were connected to the Idaho territory. Trains and paddlewheel boats needed firewood for their steam engines. All the people in Idaho depended on wood for their daily lives. By 1890 the population of Idaho was almost ninety thousand people.

In July 1893 Charles Odell Brown came to see Idaho's famous forests. He had been a timber worker in the eastern U.S. for many years. He guessed that there were 500 million ponderosa pine in southern and central Idaho. However, the great forests of western white pine in the north impressed him the most. He worked to bring timber companies to Idaho.

Getting Down To Business (1890 - 1910)

Idaho became a state in 1890. By that time, much of the open land had been claimed for homesteads. New arrivals claimed wooded land instead. Stories of Idaho's great forests began to spread.

Soon there was a "forest rush" to own forested land in northern Idaho. In 1900 Idaho's population had grown to more than 160,000 people. That same year, Frederick Weyerhaeuser and Associates came from Minnesota and started a timber company in Idaho. Other families and companies did the same. The U.S. Government set aside large forested areas as "Forest Reserves" that became National Forests. The State of Idaho became responsible for forest lands, too. These lands were to be used to help support public schools.

Within a few years Idaho had several new national forests. In 1906, a new sawmill at Potlatch, Idaho became the country's biggest white pine mill. Idaho was becoming a leader in the nation's timber industry. Forests were valuable property, and firefighting efforts began. A snag (a standing dead tree) on Bertha Hill in the Clearwater River country was possibly the first fire lookout. A ladder was nailed to the side of the tree, and a platform was placed at the top.

In August of 1910 a huge wildfire swept across the northern part of the state. It burned 3 million acres in two days. Dozens of people were killed. Sawmills burned down and the town of Wallace was mostly destroyed. A ranger named Ed Pulaski saved his firefighting crew. He made them stay in a mine shaft until the fire burned past them. Later he invented a firefighting tool that does the job of an axe and a hoe. This tool, called a pulaski, is still used by firefighters today.

The Production Years (1900 - 1960)

By 1910 the state population had doubled again to more than 320,000. People everywhere needed wood. The timber industry was booming. Frederick Weyerhaeuser, Jr. declared that one western white pine, found near the current town of Bovill, was "the King of White Pines." It was cut down in 1911 because it was diseased and rotting. A bigger specimen of western white pine has never been found.

Times were changing. To stay in business, companies had to change, too. Three of the companies that added more modern equipment were Potlatch Industries, Boise-Payette Lumber (later Boise-Cascade) and Diamond Match Company. Some companies started making other products, like cardboard and paper.

Forest Management (1960 - present)

Idaho's forests have become more valuable than ever, and not just for the trees. Attitudes about forests have changed. Early Idaho settlers worried most about their daily needs. They didn't think much about the future of their forests. Today, over a million people live in Idaho. They still need wood from the forests for building materials, paper products and fuel. But they also want the forests to provide places for recreation, wildlife habitat, clean air and water, scientific study and scenery.

To provide so many things, forests must be cared for well. Trees are only harvested in certain areas. Foresters plan when to harvest trees, and what logging method is best. Roads are designed to be safe and to protect water quality. Wildlife habitat, soil conservation, safety and tree planting are all part of forest management. Wildfires are sometimes allowed to burn. Sometimes they are put out. Today, businesses, government agencies and private landowners work together to sustain the health, beauty and production of Idaho's forests.

People and Idaho's Forests, Lesson One. People, forests and time.

Overview: Students will learn about the history of Idaho forests by reading pages 10-13 in the Student Reader and by responding to comprehension questions.

Objectives: Students will:

- describe how wood was used by native inhabitants, by settlers, and by the timber industry
- list some of the factors that brought people to Idaho
- realize the importance of forests to the growth of Idaho

Idaho Content Standards: 4.LA.1.2.2, 4.LA.1.2.3, 4.LA.1.8.3, 4.LA.1.8.4, 4.LA.2.1.3, 4.SS.1.2.1, 4.SS.1.2.3, 4.SS.2.3.3.

Materials: Student Reader pages 10-13, Student page.

Answers to Student Page questions

1. Who built Idaho's first sawmill? What did this sawmill use for power?
The missionary Henry Spalding. The mill was powered by water.
2. How many people lived in Idaho in 1868? How many people lived in Idaho in 1890?
1868: Fewer than 20,000. 1890: Almost 90,000.
3. List two reasons people came to Idaho during the "Discovery Days."
The Oregon Trail brought settlers; the discovery of gold brought prospectors; the forests brought lumbermen.
4. How much forest burned on August 20-21, 1910?
Three million acres.
5. Where was the biggest sawmill in the country in 1906?
Potlatch, Idaho.
6. What is a pulaski?
A firefighting tool that does the job of an axe and a hoe.
7. Where was the biggest white pine ("King Pine") found?
Near Bovill, Idaho.
8. What kinds of new wood products were made during the "Production Years"?
Cardboard. Paper.
9. Name two things, other than wood products, that Idaho forests provide.
Recreation, wildlife habitat, clean air and water, scientific study, scenery.
10. Name two ways people take care of forests.
Only harvest in certain areas, plan where to harvest, choose best logging method, build safe roads, consider water quality when building roads, let some fires burn, put some fires out, etc.

People and Idaho's Forests, Lesson Two. Biggest ever!

Overview: Students write a letter expressing their opinions concerning what should be done with their discovery of a giant white pine.

Objectives: Students will:

- express their ideas on the significance of finding a giant white pine
- practice writing a letter to a government official

Idaho Content Standards: 4.LA.3, 4.LA.4.3.1, 4.LA.5.1.1, 4.SS.4.2.1, 4.SS.4.2.2, 4.SS.4.3.2.

Materials: Student Reader, Student Page, pencil or word processing program.

People and Idaho's Forests, Lesson Three. Pay Day.

Overview: Students calculate the wages of sawyers 100 years ago and today, and the payroll of a sawmill.

Objectives: Students will:

- know what an early sawyer might have earned
- compare the differences in wages between 1903 and today
- practice multiplication skills

Idaho Content Standards: 4.M.1.1.6, 4.M.1.1.7, 4.M.1.2.3, 4.M.1.2.6, 4.M.1.2.7, 4.M.1.2.8.

Materials: Student page, calculator

Answers to Student Page questions

1. If you were a sawyer in 1903 working 10 hours a day, how much money would you earn in one week? In one year?

$$\$0.60 \text{ per day} \times 6 \text{ days per week} = \$3.60 \text{ per week.}$$

$$\$3.60 \text{ per week} \times 52 \text{ weeks per year} = \$187.20 \text{ per year.}$$

2. If the sawmill owners had 45 sawyers working for them, how much would the sawmill have to pay out to sawyers each week? Each year?

$$45 \text{ sawyers} \times \$3.60 \text{ per week} = \$162.00 \text{ per week.}$$

$$\$162.00 \text{ per week} \times 52 \text{ weeks per year} = \$8424.00 \text{ per year.}$$

3. If you were a sawyer today, you might earn \$18.00 per hour. How much would you earn in a 10-hour day?

$$\$18.00 \text{ per hour} \times 10 \text{ hours per day} = \$180.00 \text{ per day.}$$

4. Compare the amount today's sawyer earns in one day to how much a sawyer in 1903 earned in one year.

The modern sawyer in our example earns \$180 per day. The sawyer in our 1903 example earned \$187.20 per year. Today's sawyer would earn \$7.20 less in a day than a 1903 sawyer would earn in a year.

People and Idaho's Forests, Lesson Four. Idaho is Growing!

Overview: Students will interpret information from a table and a bar graph of Idaho population growth over time.

Objectives: Students will:

- interpret information from the table and bar graph

Idaho Content Standards: 4.LA.1.2.3, 4.LA.1.8.3, 4.LA.6.3.2, 4.M.1.1.6, 4.M.1.2.2, 4.M.1.2.6, 4.M.5.1.1, 4.M.5.1.2, 4.M.5.5.1.

Materials: Student page

Answers to Student page questions

1. A decade is a span of ten years. Between which two decades did the population of Idaho double?

Between 1900 and 1910 the population grew from 160,000 to 320,000.

2. What was the population at the beginning of the decade in which you were born?

At time of publishing, 4th graders would have been born in the 1990s. The population in 1990 was 1 million people.

3. How much did the population change between then and the next decade?

Between 1990 and 2000, the population grew by 300,000 people.

4. How many more people lived in Idaho in 2000 compared to when Idaho became a state?

Idaho became a state in 1890, with a population of 89,000 people. In 2000, there were 1.3 million people. 911,000 more people lived in Idaho in 2000 than in 1890.

5. What do you predict the population of Idaho will be in 2010? On what do you base your prediction?

Answers will vary.

Teacher Tools

- **Glossary words by section of Student Reader**
- **Glossary**
- **Student Page masters**

Glossary words by section of Student Reader

King Pine, Student Reader pages 1-3

Elevation

Fire suppression

Fungus

Legislature

Pinus monticola

Resist

Ribes

Spore

White pine blister rust

Forest Digest, Student Reader pages 4-7

Federal land

Forest reserves

Government agency

Homestead Act

National forest

Precipitation

Private land

Public land

Tree farmer

Wilderness Area

Tools of the Trade, Student Reader pages 8-9

Byproduct

Band saw

Cant

Cross-cut saw

Forest Practices Act

Harvester

Kerf

Laser

Renewable Resource

Sawdust

People and Idaho's Forests, Student Reader pages 10-13

Conservation

Forest management

Forest reserves

Paddlewheel boat

Particle Board

Pulaski

Recreation

Snag

Wildlife habitat

Band saw. A band of toothed metal. Used in many sawmills.

Byproduct. A secondary product (not the main thing you were making) resulting from manufacturing. Example: sawdust is a byproduct of making boards out of logs.

Cant. A square timber formed by cutting the sides off a log.

Conservation. Use of natural resources in a way that makes sure they will be available for future generations.

Cross-cut saw. A saw operated by one or two people. Used to cut a tree or a board.

Elevation. Distance above sea level.

Federal land. Public land managed by a United States government agency.

Fire suppression. Putting out fires.

Forest management. Caring for a forest to keep it healthy and growing while meeting owner objectives.

Forest Practices Act. Idaho state law that protects water quality, and requires reforestation after tree harvest.

Forest Reserves. Federal forestland protected in 1891. Became the national forests.

Fungus. A plant-like living thing that can't make its own food. Mushrooms are the best-known fungi.

Government agency. A part of the government with specific responsibilities. Example: The Idaho Dept. of Lands is a state agency responsible for many state-owned lands.

Harvester. A modern logging machine that cuts and delimits (cuts branches off) trees, and cuts trees into logs in the forest.

Homestead Act. A U.S. law that allowed people to own property by living on it and using it for a certain number of years.

Kerf. Width of a saw blade's cut. Thinner kerf = less sawdust and more boards.

Laser. An intense concentrated beam of light.

Legislature. Law-making body.

National Forest. Public forestlands managed by the U.S. Forest Service.

Paddlewheel boat. A boat with a large wheel fitted with paddles. The paddlewheel is driven by an engine and moves the boat.

Particle board. Made of wood fragments, like chips or shavings, that are pressed and glued together.

Pinus monticola. Scientific name of western white pine.

Precipitation. Rain, snow and other forms of water falling from the sky.

Private land. Land owned by a person, group of people or a business.

Public land. Land managed by local, state or federal government agencies for the benefit of the citizens.

Pulaski. A fire-fighting tool that combines a hoe and an axe. Also the name of the man who invented the tool.

Recreation. Play. Something that refreshes the mind or body.

Relic. An object from the past.

Renewable resource. Something from the earth, such as plants and trees, that can grow back after use.

Resist. To oppose. Example: Some western white pine trees can resist (not die from) blister rust.

Ribes. Scientific name of gooseberry and currant shrubs-- a host for white pine blister rust.

Sawdust. A byproduct of making lumber.

Snag. A standing dead tree.

Spore. Seed-like reproductive structure of a fungus.

Tree farmer. Private forestland owner who manages his/her forest to meet specific objectives. (Examples: wildlife habitat, income, beauty.)

Trust lands. Lands managed on behalf of another. Example: Idaho Department of Lands manages state trust lands to earn money for public schools and other institutions.

White pine blister rust. A fungus that infects western white pine trees.

Wilderness Area. Federal public land that is set aside to remain undeveloped.

Wildlife habitat. The place an animal lives where it has food, water, shelter and space.

5. There are not as many western white pine trees in Idaho's forests now as there were 100 years ago. What are some reasons for this?

6. How did white pine blister rust come to Idaho?

7. What is the role of *Ribes* (currant and gooseberry shrubs) in the blister rust life cycle?

8. Describe one way fire can help a western white pine forest.

9. What are scientists doing today to help the western white pine?

Bonus question:

10. What else do you think should be done to help the western white pine?

A Good Symbol for Idaho

Write a letter based on one of the following prompts.

Prompt One.

It is 1935. You believe the western white pine should be named Idaho's state tree. Write a letter to the Idaho State Legislature. Describe the tree and why you think the western white pine deserves this honor. Draw a picture of a western white pine tree to include with your letter.

Prompt Two.

Choose another state and learn about its state tree. (Use an encyclopedia, or visit www.50states.com/tree). Write a letter to a 4th grade student in that state. Ask questions about their state tree. Tell them about Idaho's state tree, including why you think it was chosen for this honor. Draw a picture of a western white pine tree to include with your letter.

The King is Growing

Western White Pine Growth

Age (years)	Height (feet)
10	9
20	26
30	43
40	60
50	78
60	94
70	109
80	120
90	128
100	136
110	141
120	146
130	150
140	154
150	158
160	161
170	164
180	164

1. How tall was the tree when it was 10 years old?

2. How tall was the tree when it was 60 years old?

3. How many feet did the tree grow between its 10th birthday and its 100th birthday?

4. How old was the tree when its growth began to slow down?

Bonus Question

5. How tall do you think the tree will be when it is 200 years old?

Ultralight Trips Across Idaho!

Imagine you are going to take a trip to Idaho's forests. You won't be driving or walking. You'll be flying in your very own ultralight! (An ultralight is a small, one-person airplane - like a hang glider with an engine.) You're the pilot. Your mission is to fly to different forest types in Idaho. To plan your trip, you will need the Idaho Map Student Page, the Forest Types map and the Precipitation map in your Idaho Forest Reader (pages 4-5), a ruler, and colored pencils.

.....

Mark an X on the map to show the location of your home.

Trip One. Use a colored pencil to draw an ultralight route on the map so that you visit one of the marked towns (St. Maries, McCall, Island Park). Begin and end the trip at your home town.

1. Town visited: _____
2. What are the main forest types near the town you visited?
3. What types of forests did you fly over on your trip?
4. What is the average annual precipitation near the town you visited?
5. How many miles did your route cover? (Show your work.)
6. Traveling at 40 miles per hour, how many hours did your trip take? (Show your work.)

Ultralight Trips Across Idaho!

Trip Two. Use a different colored pencil to draw a route that visits another of the three marked towns. Begin and end your trip at your home town.

7. Town visited: _____

8. What are the main forest types near the town you visited?

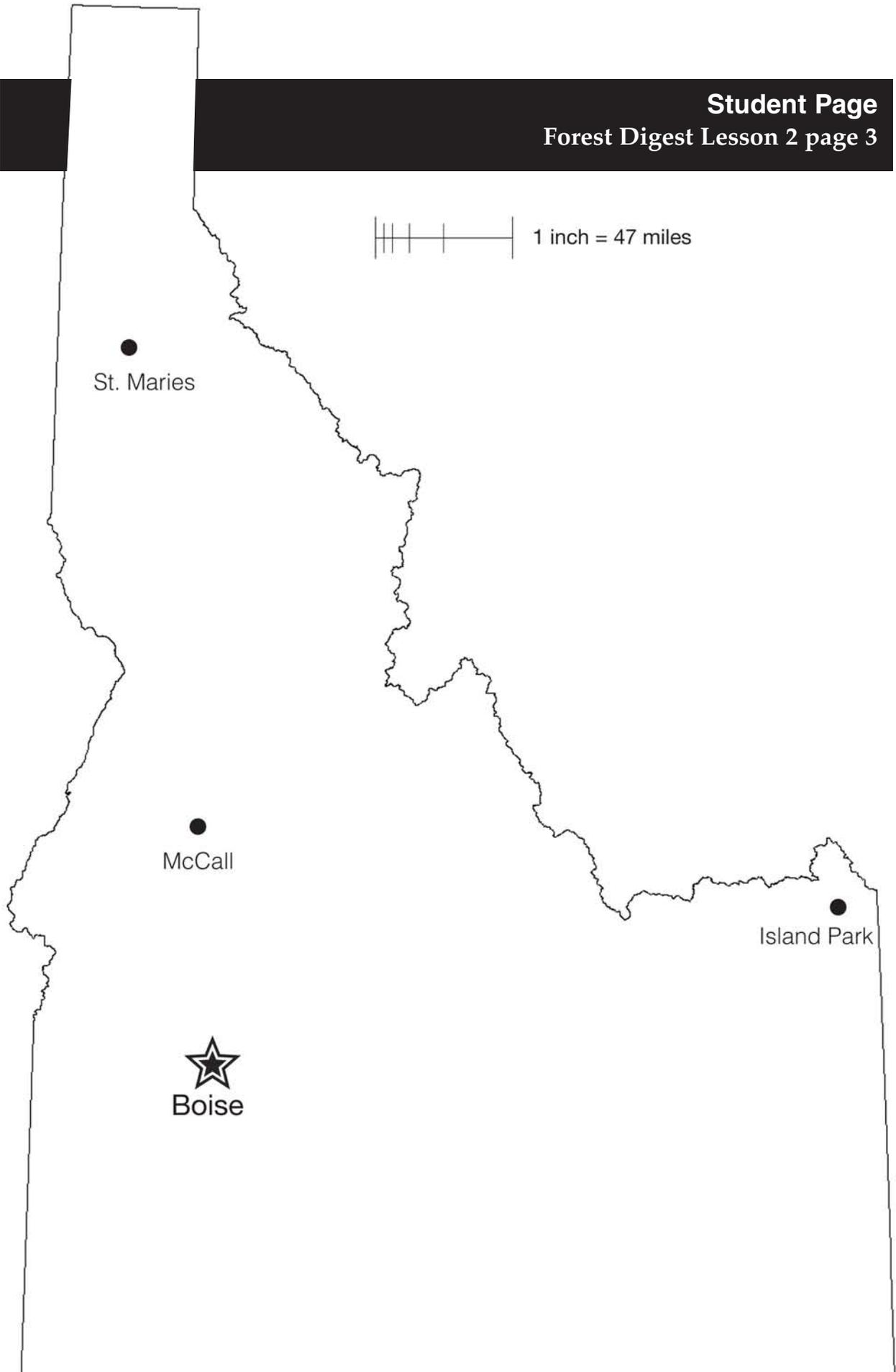
9. What types of forests did you fly over on your trip?

10. What is the average annual precipitation near the town you visited?

11. How many miles did your route cover? (Show your work.)

12. Traveling at 40 miles per hour how many hours did your trip take? (Show your work.)

 1 inch = 47 miles



Cutting Trees Then and Now

Complete the following story problems. Show your work.

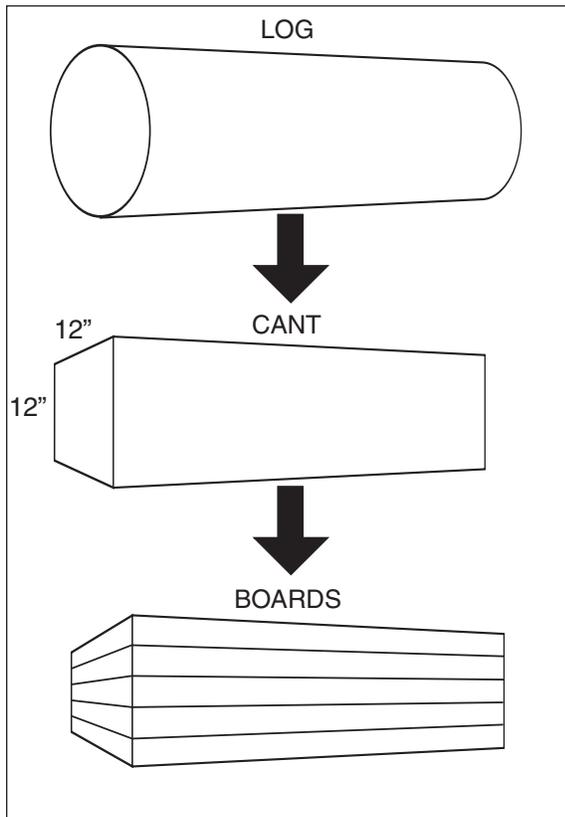
1. The year is 1890. Suppose it takes two sawyers using axes and a crosscut saw two hours to cut down one tree. If they work for 10 hours, how many trees will they cut in a day?

2. Now it is 1960. Suppose it takes one sawyer using a chainsaw one hour to cut six trees. How many trees can two sawyers cut down in a 10-hour work day?

3. Fast forward to today! Suppose one person operating a modern harvester can cut 200 times as many trees in a day as two sawyers in 1890. How many trees could today's sawyer cut down in 10 hours?

4. What other information could affect the number of trees cut in a day?

Sawdust: Waste or Not?



The year is 1890. You are working in a lumber mill. You have a log which must be cut ("milled") into boards. Your first job is to square off the log by sawing off the rounded sides. Now you have a large, square chunk of wood (a "cant"), 12 inches on each side. Your next job is to saw the cant into 5 equal-sized boards.

1. How many cuts will you have to make to saw the cant into five boards?

Your 1890's saw has a "kerf" of $\frac{1}{2}$ inch. (The "kerf" is the width of the saw cut.) That means that for every cut you make, $\frac{1}{2}$ inch of wood ends up as sawdust.

2. How much wood will end up as sawdust when you cut the cant into five boards?

3. How thick will each board be?

Technology Through Time

Put items from the following list in the appropriate boxes below. (HINTS: There may be more than one answer for some boxes. You only need to put ONE right answer in each box. You might not use all the items in the list.)

- | | | |
|--|---|---|
| <ul style="list-style-type: none"> Band saw Burned to make electricity Chainsaw Cross cut saw Computers Feller buncher Fire lookout Fire suppression (putting out fires) Forwarder Horse | <ul style="list-style-type: none"> Lasers Letting some forest fires burn Log drive on river Log truck Helicopter Made into particle board and other wood products Made into paper No planting Open burning | <ul style="list-style-type: none"> Oxen Planting trees for the future Putting out some forest fires Railroad Skidder Steam-powered saw Thinner kerf saw blade Tepee burner Used to make paper White pine blister rust |
|--|---|---|

	1800s	Mid-1900s	Today
Harvesting (cutting) trees	Cross-cut saw	Chain saw	Cut-to-length harvester
Transporting logs from forest to mill			
Sawmilling			
Managing forests			
Dealing with sawdust "waste" from sawmills			

People, Forests and Time

Use pages 10-13 in your Idaho Forest Reader to help you answer these questions.

Discovery Days

1. Who built Idaho's first sawmill?

What did this sawmill use for power?

2. How many people lived in Idaho in 1868?

How many people lived in Idaho in 1890?

3. List two reasons people came to Idaho during the "Discovery Days."

Getting Down to Business

4. How much forest burned on August 20-21, 1910?

5. Where was the biggest sawmill in the country in 1906?

6. What is a pulaski?

The Production Years

7. Where was the biggest white pine ("King Pine") found?

8. What kinds of new wood products were made during the "Production Years"?

Forest Management

9. Name two things, other than wood products, that Idaho forests provide.

10. Name two ways people take care of forests.

Biggest Ever!

Writing prompt

Imagine you have just discovered a white pine even bigger than “the King of the White Pines” (found near Bovill, Idaho in 1911). Write a letter to the governor of Idaho, about your discovery and what you think should be done with the tree.

Pay Day

One sawmill operating in 1903 paid their sawyers sixty cents per day. They worked ten hours a day, six days a week. (Show your work on each question.)

1. If you were a sawyer in 1903 working 10 hours a day, how much money would you earn in one week? In one year?

2. If the sawmill owners had 45 sawyers working for them, how much would the sawmill have to pay out to sawyers each week? Each year?

3. If you were a sawyer today, you might earn \$18.00 per hour. How much would you earn in a 10 hour day?

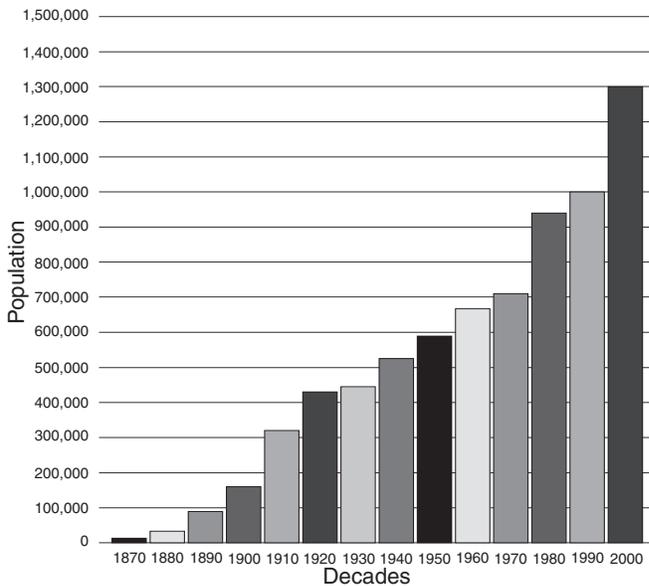
4. Compare the amount today's sawyer earns in one day to how much a sawyer in 1903 earned in one year.

Idaho is Growing!

The table and bar graph show two different ways to display the same information. Use the table and the bar graph to help you answer the questions.

Idaho Population Over Time

Year	Population
1870	13,000
1880	33,000
1890	89,000
1900	160,000
1910	320,000
1920	430,000
1930	445,000
1940	525,000
1950	589,000
1960	667,000
1970	710,000
1980	940,000
1990	1,000,000
2000	1,300,000



Questions.

1. A decade is a span of ten years. Between which two decades did the population of Idaho double?
2. What was the population at the beginning of the decade in which you were born?
3. How much did the population change between then and the next decade?
4. How many more people lived in Idaho in 2000 compared to when Idaho became a state?
5. What do you predict the population of Idaho will be in 2010? On what do you base your prediction?

the
IDAHO FOREST



TEACHER GUIDE

