Please Note: This curriculum was developed for the Flash-based interactive DVDs, and so many of the lessons refer to the DVDs as opposed to the website. So if you are using this curriculum with the web version of Fire On The Land, you can simply ignore the references to the DVD. Because all of the content on the DVD is on the Fire On The Land website and because the menus are basically the same, so you will can still use this curriculum, you just need to navigate to the web page you need.
Fire on the Land
An Integrated Multimedia Curriculum Framed by the Cultural Values of the Salish and Pend d’Oreille People

Funded by the Bureau of Indian Affairs-National Interagency Fire Center

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That is why my elders—my father's father and beyond—that is why they would burn: for the animals and for the huckleberries and the medicines."

—John Peter Paul, Pend d'Oreille elder, Confederated Salish and Kootenai Tribes, circa 1999

What comes to mind first for many when they think about wildfire in the Northern Rockies are smoky summer skies, blackened mountain sides, and perennial worries about homes in the wildland-urban interface. But that's only part of the picture. Wildfire is as much a part of our landscapes as the weather. It renews our forests and prairies. It is necessary for the natural propagation of dozens of tree and plant species. It creates habitats for wildlife. Many of the iconic species of our region—ponderosa pine, western larch, huckleberry, grizzly bears—benefit from or depend on fire.

While today most of our wildfires start naturally by lightning, in the past our ancestors—those of the Salish and Pend d'Oreille—lit many of the fires. For thousands of years they more than doubled the frequency of natural fires in the region. The plant and animal communities we know and love are the legacy of that burning. In our tradition, fire is not an evil to be feared or hated. Rather, it is a gift from the Creator that can nurture life, a tool that, when properly respected, can be used to take care of the lands we have been entrusted with. Though expressed in different terms, the best available science now supports this view. In the words of ecologists:

…properly functioning forests proceed through cycles of succession and disturbance [wildfire being by far the primary disturbance factor] . If we would conserve biological diversity and ecological integrity, we must allow for these cycles . If we are to manage these forests for a variety of values and simultaneously maintain forest ecological integrity, we must represent as closely as possible these cycles with our management activities1 .

There is no question that enormous areas of the forests and grasslands we inherited were very much cultural landscapes, shaped profoundly by human action… The wildlife communities that characterized these cultural landscapes… are in large measure products of thousands of years of human intervention . And it will take continued human intervention to maintain them… This knowledge (about Indian burning) can help us understand why and how our forests have changed .2

This curriculum and the Fire on the Land DVD set upon which it is based integrate tribal and scientific knowledge about fire. Through the curriculum, students can explore a Coyote story about stealing fire from the sky world, listen to interviews with tribal elders and fire managers, interact with a primer on the science of fire ecology, read a history of the collision of Indian burning with non-Indian attempts to suppress and exclude fire from the land. Underlying the tribal view and incorporated into the curriculum are the cultural values of the Salish and Pend d'Oreille. Inseparable from the way we interact with and perceive the land and other people, these values include: respect, honesty, humility, generosity, courage, kindness and compassion, patience, humor, good cheer, warmth, endurance, strength, fortitude, cooperation and helpfulness, selflessness, quiet and calm, thoughtfulness, level-headedness, self restraint, self discipline, responsibility, self respect, observation and listening, and relatedness.


Welcome

That is why my elders—my father’s father and beyond—that is why they would burn: for the animals and for the huckleberries and the medicines."

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The values make up a unified whole, at the center of which is a deeply held spiritual attitude of respect toward the land, water, plants, and animals and a way of living closely and in community with one another. A sense of reciprocity—of giving as much as one takes or receives, whether from the earth or from each other—is one manifestation of this. The Tribes’ use of fire and attitude toward fire grew out of these cultural values and this belief system. So we begin each lesson by listing and defining the cultural values relevant to the lesson’s content. We believe that if each lesson is to be effective in teaching about fire and its value to both humans and natural systems, it must be placed within this larger context, the Salish and Pend d’Oreille world view. That world view is a window into the way that fire was successfully used to shape and maintain landscapes for many thousands of years. It offers an alternative way of looking at both fire and landscapes.

In this tribal view, the natural and spiritual worlds are valued equally. Animals and plants are respected because they were here before us and have nurtured us from the beginning of time. We honor them by never taking more than we need, never failing to leave something for others, and never wasting anything. We care for them, using fire as one of our primary tools (as the Coyote story teaches, it is time for humans to return the gift of fire to the animals). Similarly, we value, honor, and respect our elders and ancestors, and we love our children. For them we want to ensure the continuation of our languages and cultures. Fire plays a role here, too, because the kind of burning we have done for thousands of years helps conserve and enhance biological diversity and ecological integrity. We can leave no greater gift to future generations.

So welcome, and thank you for using this integrated, multimedia curriculum. We welcome your comments and suggestions, which you can send to:

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Dear Fellow Educator,

The curriculum you have in your hands is like no other. Designed to impart some of the traditional values of the Salish and Pend d’Oreille people, it is uniquely integrated, connecting many content areas, skill sets, and contexts in the same way the Salish and Pend d’Oreille continue to acknowledge and respect the relatedness of all things.

In schools, we often separate domains of knowledge and skills from each other in ways that can actually make learning harder for children. History (or story) is separated from scientific investigation; cultural understanding is removed from development of essential skills like listening or literacy. Our days are divided into small, distinct bursts of activity around tiny pieces of content or isolated skills. We continue to do this, driven in part by textbooks, policy, and traditional ideas about how “school” works, in spite of our awareness that depth of study and inquiry drawing from many different content areas and skill sets lead to improved outcomes for children.

This curriculum, in keeping with traditional ways of teaching and learning among the Salish and Pend d’Oreille, is designed to blur the artificial lines drawn between many areas that are often taught separately in our schools. As a result, while some lessons are ideal in science, others lend themselves to being taught in time reserved for the language arts, and still other elements or lessons provide significant content in areas of history, culture, art, technology, and Indian Education for All.

When preparing to teach this curriculum, there are a few things to keep in mind. First, it is broken into 12 units of inquiry that either start or finish with the Coyote story *Beaver Steals Fire*, depending on the time of year. One strategy that could work for some would be to lay the groundwork for the study, beginning with *Beaver Steals Fire* in February, when snow is on the ground and starting slowly—accelerating and immersing students in the entire curriculum (taking substantially more time) after the March testing window. Use the *With Our Own Hands* project in April or May to end the study. If selecting to teach this curriculum in the Fall, begin with *What Do You See*, and time *With Our Own Hands*, completing them before the weather turns. Finish the curriculum after the snow falls, with a traditional telling of *Beaver Steals Fire* and celebration. You may choose to omit or delay teaching certain units of inquiry in the curriculum cycle based on your students’ needs.

Second, in place of traditional objectives, this curriculum employs learning targets stated as “I statements” in language intended to be shared up front with your students. Post these as they are addressed and refer to them often to support your students’ meta-cognition or thinking about their thinking. The learning targets are linked back to state and national content standards in a wide variety of content areas.

Third, you will notice text boxes sprinkled throughout the document. These are teacher tips or notes regarding pedagogy, to help you as a teacher more deeply and consciously understand some of the instructional practices that are employed.

Fourth, you will notice the procedures section is broken down by day. Instructionally, these are actually class periods and may be separated by days. If you are integrating this curriculum as intended into more than one content area, several class periods may actually occur on the same day.

Finally, again, as you look at the procedures, you may notice they are highly explicit. They were developed this way to support teachers with differing levels of experience or who want to expand their personal instructional repertoire to include new interactive strategies. Take them in whole or in part, as you wish. Adapt them as needed to suit your students, but also, consider trying out new strategies, even ones you believe might be “too hard” for your children. They will rise to your expectations—so be sure those expectations honor the unlimited potential of each child.
The intent of the elders and the Confederated Salish and Kootenai Tribes’ Natural Resource Department was to develop curriculum for K-12 schools that is framed by cultural values and teaches the history of fire use by the Tribes as well as fire ecology principles, knowledge of fire behavior, impacts of fire on plants and animals, and the critical role of fire and its use as a management tool. I am honored to have been invited to support this outstanding material. The writing of this curriculum has been a journey filled with joy and wonder. I hope the journey of children and their teachers who embark on this study together is as rich as my own.

Sincerely,

Tammy Elser
Overview and How to Use the Electronic Version of the Curriculum

Overview of the Lessons

Tab 2: Beaver Steals Fire

Start here if there is snow on the ground. If there is no snow, go to Tab 3.

*Beaver Steals Fire* is a contemporary retelling of a traditional Coyote story that teaches fire was a treasured gift taken by the animal people to help humans who were yet to come. The lesson, which targets grades 1 to 3 but with adaptations can be used in grades K to 12, involves a whole class read-aloud; individual, partner, or small-group re-reading of selected parts; illustration of key events; attentive and active listening; summary and paraphrasing; and large-group discussion.

**Cultural Values:**
Observation, Listening, Respect, Quiet, Calm

**Steps:**
- Introduce Beaver Steals Fire
- Oral tradition
- Read Beaver Steals Fire
- Discuss gift of fire
- Discuss the world of the animal people in the story
- Cultural markers in the story
- Protocol for use and telling of the story
- Relevance

Tab 3: What Do You See?

Photographs of a landscape taken from the same photopoint over a long period of time—80 to 100 years for example—can reveal changes that might otherwise go unnoticed, especially when those changes occur over generations. Observing differences in the photos can change the way we think about the land and natural processes. This lesson, which targets grades 5 to 8 but with adaptations can be used in grades 2 to 12, involves looking at these types of photos and making careful observations about the changes that have occurred. Observation is a critical life skill. To develop observation skills takes practice and the ability to look at both the forest, or big picture, and the trees — or tiniest details. This lesson, which involves observation of details in landscape images, partner discussions, descriptive writing, comparing and contrasting information, and presentations, will help students gain awareness of what they see and help them perceive details with greater clarity and insight.

**Cultural Values:**
Observation, Cooperation, Generosity

**Steps:**
- Close examination of photographs – then and now
- 1-2-3 What do you see? Descriptive paragraphs
- Group process charts
- Compare/contrast
1.6 Curriculum Overview

- Educated guess—Which is then, which is now? Why do you think so?
- Debrief pair by pair
- DVD photo gallery

**Tab 4: Listen Up!**

Our elders have much to teach us about the world around us, especially about the land and how it has changed over time. Often the challenge is just learning to listen and listen well. Listening attentively and deeply understanding the spoken words of another are essential skills. Today, listening skills have changed as many messages are transmitted in short sound bites. Attention spans and the ability to retain information and make connections among different speakers, personal experiences, and background knowledge have diminished. This lesson, which targets grades 1 to 8 but with adaptations can be used in grades K to 12, is designed to help students develop and practice attentive, respectful listening.

**Cultural Values:**

LISTENING, COOPERATION, RESPECT

**Steps:**
- Circle phone game
- Difference between gist and literal detail
- Listening skills practice
- Pair-share activity
- Preview Incashola interview
- Summarization
- What is it like to pay full attention?

**Tab 5: The Elders and Fire**

As the previous lesson showed, careful listening is required if we are to learn from the experience of the elders and the generations that have gone before them. Information on the traditional use of fire passed on by our elders helps us understand the role of fire in creating and sustaining healthy forests. The knowledge is both useful and fascinating. This lesson, which targets grades 5 to 8 but with adaptations can be used in grades 2 to 12, involves listening to and interpreting detailed elder interviews from the DVD, small-group process, summarizing and paraphrasing, comparing and contrasting information, small-group presentations, and a large-group discussion.

**Cultural Values:**

RESPECT, LISTENING, COOPERATION, RELATEDNESS

**Steps:**
- Listening practice
- Focusing on similarities and differences
- Experiences
- Observations
- Traditional uses of fire
- Responsibility for fire
- Summarization and paraphrasing
- Cooperative work
Tab 6: The Way We Were

The Salish and Pend d’Oreille lived for countless centuries in a vast area that includes present-day Montana. Fire served many purposes in the traditional life cycle of the Salish and Pend d’Oreille. In this lesson, students will learn about that life cycle, the use of fire within it, and what the oral traditions, placenames, and trees tell us about the way the Tribes lived. It targets grades 5 to 8 but with suggested adaptations can be used with grades from 3 to 12.

CULTURAL VALUES:

RELATEDNESS, COOPERATION, OBSERVATION

STEPS:

- Tree time – chronology from different points of view
- Building background knowledge - Traditional Culture: Life Cycle, Territory, Tenure
- Territory and tenure through placenames
- Why burn? Literacy workshop headlines

Tab 7: Change for the People, Change for the Land

This unit engages students who are doing research to better understand historical events in the lives of the Salish and Pend d’Oreille and the effect these events had on our use of fire and Indian and non-Indian cultures. Through reading rich historical essays, layered reflection, a treasure hunt using the DVD, a partner research project on historical events, a partner poster project, and a hosted gallery walk, students explore the fur trade, tribal burning, missionaries, the Hellgate Treaty, Power, Railroads, the removal of the Salish from the Bitterroot, and the Swan Massacre. The lesson targets grades 5 to 8, and with suggested adaptations can be used from grades 4 to 12.

CULTURAL VALUES:

RELATEDNESS, COOPERATION, OBSERVATION

STEPS:

- Layered reading / response – Great Changes: Horses, Disease, Guns
- DVD treasure hunt
- Partner poster projects on 19th, 20th, and 21st centuries (thirteen topics) pairs, groups of three or individuals
  - Fur trade
  - Fire observation
  - Missionaries
  - Treaty
  - Power
  - Railroads
  - Bitterroot Removal
  - Swan Massacre
  - 1910 Great Fires
  - Causes of 1910 Fires
  - After 1910 Fires – Suppressing dissent and fire
  - Fire, forestry, and sovereignty
  - Global Warming
- Partner posters – historic event>change in the use of fire
- Timeline, hosted gallery walk of posters
  - Fill in chart (When … fire use…….) for each major topic area addressed in the history
Tab 8: Impacts and Opportunities

Elders know some plants and animals are more abundant after fire and some are unchanged, while others decrease in number. A variety of habitats are necessary to support animals and plants, and fire is one tool used to create disturbances that result in many different forest and prairie types. In this lesson, which targets grades 3 to 6 and can be adapted for students from grades 2 to 12, students explore the lifeways and needs of a plant or animal — and the role fire plays in creating its home. It involves independent research, note taking, writing, publishing, and sharing with class.

**Cultural Values:**
- Relatedness, Observation

**Steps:**
- Concept of disturbance
- Plant and animal research project
- Fire impacts and opportunities
- Power point reports (or video, web-page, blogs, wikis or moodles)

Tab 9: Recipe for Fire

For the elders, the knowledge regarding the use of fire and the ingredients that create and sustain fire are common sense. It was knowledge they always held and passed down through stories and by demonstrating the use of fire to each subsequent generation. When fire scientists talk about fire, they use models and the language of fire science. Today, we use fire science informed by the knowledge of our elders. In this lesson, students will explore the *fire triangle* — the ingredients required for fire. A writing activity, a small-group process, a scientific experiment, observations on the experiment, and a whole-group debriefing teach students about the fire triangle. The lesson targets grades 5 to 8 but can be adapted for grades 3 to 12.

**Cultural Values:**
- Responsibility, Self-Restraint, Fortitude, Skill, Relatedness, Balance, Observation, Cooperation, Respect

**Steps:**
- Science of fire
- Requirements for fire
- Heat, fuel, oxygen
- Experiment
- Respect for fire
- Safety first
- Ignition sources
- Demonstration of traditional fire starting techniques

Tab 10: If This...Then What

Our elders knew the effect of fire on the land, the animals, and the plants; they understood its effects on the varied resources required to survive. They burned for many reasons. The result of frequent, low-intensity fires included open stands of timber with varied grasses, berries and bushes, as well as abundant game. In this lesson, students will explore the nature of forest succession and learn to predict how different forest and grassland types will respond to fire using a problem-solving game. The lesson targets grades 5 to 8 but can be adapted for grades 3 to 12.
Cultural Values:

**Relatedness, Cooperation, Humor, Observation**

Steps:

- Direct instruction from DVD on forest types and succession
- Field experience – photographs of stages in forest succession (optional)
- Matching game
- If this...then what? Succession Game

Tab 11: Fire Managers

Fire managers apply findings from research, knowledge passed down from our elders, and their direct observations to understand the role of fire in creating and sustaining healthy forests. They have complicated, interesting jobs that provide major benefits to our society. To learn from the experiences of the fire managers and the challenges they face, students will listen to interviews, interpret the messages, summarize, paraphrase, and share what they learn with their partners. The lesson targets grades 5 to 8 but can be adapted for grades 4 to 12.

Cultural Values:

**Respect, Observation, Listening**

Steps:

- Listening to Fire Managers
- Observations on the land
- Application of indigenous knowledge and science

Tab 12: Fire Behavior Game

For millennia, Tribal knowledge of fire predicted the effects of fire on the land. This knowledge enhanced the positive impacts and diminished the damaging consequences of fire. With changes disrupting the use of fire, awareness of fire behavior has diminished. At the same time, we live in a landscape where the loss of the use of fire as a tool has dangerous consequences. Everyone needs to understand the basics of fire behavior and the variables that make that fire beneficial—or deadly. This lesson, targeting grades 5 to 8 and that with adaptations can be used with grades 3 to 12, includes direct instruction, small-group process, simulation, and a game using “Pictionary” or story-board techniques.

Cultural Values:

**Relatedness, Humor, Level-Headedness**

Steps:

- Four variables deck – earth, water, wind, and fire
- Introduce the rules
- Establish groups
- Play the game
- Chart out fire behaviors
- Report out behaviors
- Repeat as time allows
Tab 13: With Our Own Hands

The Tribal use of fire requires that care is taken to maintain the balance among the needs of wildlife, plants, and human beings. With preparation, homes in or near wildlands can be relatively safe from wildfires. In this lesson, students will take what they have learned to the field and help a member of their community reduce the chance of losing their home to wildfire and will learn strategies to help people coexist with fire. It targets grades 5 to 8 but with adaptations can be used with grades 3 to 12.

Cultural Values:

Helpfulness, Cooperation, Generosity, Endurance, Strength, Gratitude

Steps:

- Wildland-urban-interface field experience
- Defensible space identification
- Hands-on fuels analysis
- Strategies to create defensible space
- Project work creating defensible space
- Celebration! Cook-out over open fire
- After action analysis (before and after photos)
Information Contained in Each Lesson

Cultural Values
The cultural values of the Salish and Pend d’Oreille are inseparable from the way we, as Tribes, interact with and perceive the land and other people. They make up a unified whole, at the center of which is a deeply held spiritual attitude of respect toward the land, water, plants, and animals and a way of living closely and in community with one another. We believe that if each lesson is to be effective in teaching about fire and its value, it must be placed within this larger context.

Rationale
The purpose of the lesson and the topics explored.

Learning Targets
“I statements” that state what the student will be able to do upon successful completion of the lesson. These are intended to be shared with your students when you begin the lesson and are linked back to state and national content standards in a wide variety of content areas.

Resources
The materials that you will need to implement the lesson.

Instructional Techniques
These are techniques and specific skills that you will use or that will be practiced or reinforced in the lesson.

Time Frame
The suggested amount of time needed to complete the lesson and a suggested way to break the lesson down by class period. If you are integrating this curriculum as it is intended—into more than one content area—several class periods may occur on the same day.

Suggested Grade Levels
The grade levels that the lesson targets and other grades that it will work with if adapted.

Procedures
Highly explicit, step-by-step teacher instructions to implement the lesson. They were developed to support teachers with differing levels of experience or who want to expand their personal instructional repertoire to include new interactive strategies. They can be followed in whole or in part and adapted as needed to suit the students.

Assessment
Ways to assess the skills and knowledge that students learn from the lesson.

Adaptations
How the lesson might be adapted for a grade level other than the targeted grade level. They can be followed in whole or in part and adapted as needed to suit the students.

References
The reference material cited or referred to in the lesson.
“A long, long time ago, the only animals that had fire lived in the land above, up in the sky. The animals on earth had no fire. They gathered and had a meeting...”
Beaver Steals Fire

Cultural Value: Observation, Listening, Respect, Quiet, Calm

Rationale
In keeping with the traditions of the Salish and Pend d’Oreille, we ask that you tell or read this story aloud only when snow is on the ground. If you do not have snow on the ground, please move on to Tab 3: “What do you see?”

“Beaver Steals Fire” is a contemporary retelling of a portion of a traditional Coyote story of the Salish and Pend d’Oreille people. Our elders learned about the use of fire from life experience and the experiences of the generations before them that have been passed on through the oral tradition. Beaver Steals Fire is part of that oral tradition. It teaches fire was a treasured gift taken by the animal people to help humans who were yet to come.

Learning Targets
- I listen attentively.
- I picture what is happening in the story in my head.
- I understand the plan created by Coyote to get fire.
- I retell the story with accuracy.
- I follow the chronological organization of the story.
- I draw scenes from the story in sequence.
- I identify parts of the story including beginning, middle, and end.
- I can state why fire was important to the animal people and to human beings in the story.
- I know how traditional stories helped teach about the natural world.

Resources
The book Beaver Steals Fire
Fire on the Land and Beaver Steals Fire DVDs (Disks 1 & 2 of the two disk set)
Computer with DVD player
PC projector or electronic white board
Drawing materials including paper, colored pencils or markers
Chart paper and markers for making predictions, etc.
Exit tickets, one per student (template attached)

Instructional Techniques
Whole class read-aloud, individual, partner or small-group re-reading of selected parts, illustration of key events, attentive and active listening, summary and paraphrasing, large-group discussion.

“The story teaches how hard it was to bring fire from the sky world. Now it is time for humans to return the gift of fire to the animals.”
Time Frame

Two 50-minute class periods; may vary based on age, grade level and teacher’s choices to support literacy goals.

1st period for book walk, predictions, listening / viewing Johnny Arlee’s telling of the story Beaver Steals Fire, confirm or reject predictions, and story maps with possible re-read (either the teacher or the Fire on the Land (disc 1) English version

2nd period for retelling of the story (students from their story maps, or Fire on the Land, disc 1, English version) followed by viewing of relevance of Beaver Steals Fire from disc 2.

Suggested Grade Levels

Grades K-12

Procedures below target students in grades 1-4. However, with suggested adaptations following the procedures section, these may be useful for grades from K to 12.

Procedures

Day One

1. Follow cultural protocol for the telling of this story in winter, when there is snow on the ground.
2. Conduct a book-walk to build background knowledge, activate prior knowledge and engage students.
3. Introduce the book, Beaver Steals Fire; storyteller, Johnny Arlee; and illustrator, Sam Sandoval.
4. As a group, make predictions about the book based on the title and the front and back cover art.
   - What do you think this book will be about?
   - Why?
5. Write these predictions on the board or chart paper where students can see them. Older students should write their own predictions first, and then share with class, creating a collective list of predictions that can be debriefed on later. Their personal list is then used for reflection.
6. Prepare students by talking about subtitles if using Johnny Arlee’s storytelling session from the DVD (Disk 2). Let them know what subtitles are and that they will have to read subtitles because part of the story they will hear is in Salish.
7. Show the DVD (Disk 2) Beaver Steals Fire with Johnny Arlee sharing the story with children in a lodge, or read the entire story aloud to the students for pure enjoyment.
8. Stop DVD at the end of the storytelling session (13 minutes).
9. Refer students back to the list of predictions made at the end of the book walk. Ask them:
   - Which of our predictions turned out to be correct?
   - Which ones were partly true?
   - Now that we have heard the story, which ones do we know are not true?
10. As they confirm or reject predictions, go back to the book (use both text and pictures) to prove or disprove.
    - We predicted......
    - What did the book say?

Avoid Interrupting the Story

Read or view the entire story without excessive “teacher talk.” It has become common for teachers to over-teach texts, often breaking them up with many side-bar literacy lessons. The most important lesson is that the story itself has value. Try to always share stories with few or no interruptions the first time through. This will increase attention spans and listening over time, and also enhance comprehension and intrinsic motivation.
2.5 Beaver Steals Fire

11. Invite discussion of the story and as it unfolds, go back to the book to confirm and support students’ comprehension. Discussion questions focused on the roles of the animals’ and Coyote’s plan might include:
- How did the animal people determine a leader?
- Who was it?
- What was their plan for stealing fire?
- Detail the steps: 1st, 2nd, 3rd…..
- Who served as a decoy? (Define decoy)
- What were the roles of the different animals?

12. Have students make chronological story maps by drawing three pictures to retell the story of Beaver Steals Fire. Require one picture from the beginning of the story, one from the middle of the story, and one from the end. The following is an example from a first grader.

Day Two

13. If time allows, this is a good time to re-read the book. Here are a few options.
- Re-read in traditional read-aloud style from the picture book.
- Use the electronic version on the Fire on the Land DVD (Disk 1) (just click the button at right and navigate to Coyote Story>Listen to Beaver Steals Fire).
- Or, based on the students’ abilities, have them re-read the story independently.

14. Using the Beaver Steals Fire DVD (Disk 2), take 8 minutes to show the relevance section (a video of Germaine White talking about the relevance of the story).

15. Set the stage for the unit (if this is the 1st lesson, rather than the concluding lesson) by posting on chart paper big ideas or questions to be answered during the unit. For example:
- What was the traditional role of fire?
- How does fire support a healthy forest?
- Why did the use of fire by people change?
- What happened to the land when fire was no longer used?

16. Set the stage for the unit (if this is the 1st lesson, rather than the concluding lesson) by sharing skills to be developed and practiced during the unit. For example:
- Listening attentively and respectfully to understand important ideas
• Speaking to share what you observe, learn or wish to learn
• Reading and writing to think deeply about important ideas and clarify understanding
• Formal and informal observation
• Cooperative work with partners or small groups
• Cultural competence
• Tribal values

17. Allow time for students to complete their illustrations.
18. Close the class by requiring a quick-write exit ticket to determine the level of understanding at the beginning of the unit. This will be compared to a similar exit ticket at the conclusion of the entire unit to determine growth in understanding.
19. Pass out exit ticket form attached to this lesson.
20. Have them write a short paragraph answering the following question:
   • Based on what you know today, what is the importance of fire?
21. Set writing timer for 5-10 minutes. Use protocol for quick-writes.
   • Write quickly and do not stop.
   • Don’t worry about spelling or grammar as you get your ideas down.
   • This is what you think now. There are no “wrong” answers.
   • Go! Create urgency. Allow 5 to 10 minutes for the quick-write.
22. If you choose, allow an additional 4 to 5 minutes after the quick write to check for the following and revise:
   • short paragraph
   • three ideas
   • complete sentences
23. Once the quick writing is completed, students pair-share, each taking time to share what they think. This should not take more than five minutes, including the pairing, sharing and return to seat.
24. Have them turn in the exit tickets before the end of class.
25. If time allows, have students retell the story prompted by their picture story maps.

**Extension**
Depending on your community, you could select to do a winter walk to a location with a fireplace. Some cafés, hotel lobbies or other community businesses might welcome a group of students for 45 minutes or so for hot chocolate and a fireside story time with *Beaver Steals Fire*. Coming in from the cold, this would be a fun kickoff or a memorable closing lesson to the *Fire on the Land* unit for K to 5th graders.

**Assessment**
- Direct observation of listening behavior.
- Drawings made by students of key events in the story.
- Accurate retell of the story with or without the drawings.
- Student quick-writes, “The importance of fire.”
- Evidence of student awareness resulting from in-class discussion of how traditional stories helped to teach about the natural world.
Adaptations

The following adaptations are designed to support your efforts to meet the needs of every learner. Grade levels here are only a suggestion and would not preclude use of a great 3rd grade strategy with a 9th grader or vice versa.

**Grades K-3 (or students at any level who need more support)**

The critical task of primary students is the development of independent literacy – both reading and writing. To achieve this, they will require modeling, demonstration and temporary supports. The following procedural options could help you more closely meet these needs.

1. For beginning readers, write the book title on the board and say it slowly, providing one-to-one matching support. This is a good opportunity to pre-teach a few sight words from the book.

2. Vocalize words as you write predictions or capture any other part of the class discussion on the board. Students learn phonics in context from writing and watching you write and talk about your thinking as you write and re-read what you have written. This is important modeling and language experience.

3. You could use the language experience approach (group dictation with modeling of writing by the teacher) and a KWL chart for emergent readers at the Kindergarten or early 1st grade levels (filling in only the K and W sections with whole class participation) in place of the individual exit ticket.

**Grades 4-6 (or students at any level who require greater challenge)**

This age group needs reading practice and will continue to benefit from stories read aloud or told. In addition, when a story has a written form, they should always be required to do some of the reading independently or with guidance. They benefit from developing an understanding of genres and story structures, as well as rich exposure to the cultural context for the use of a story. The following options could help you extend their learning during the *Beaver Steals Fire* lesson.

1. Take advantage of the opportunity to examine genre and genre labels associated with traditional literature. Clarify that animals talking is not a feature of fantasy if a text or story otherwise meets the criteria of traditional literature.

2. This age group would benefit from reading the story independently before viewing the DVD.

3. After their independent reading, have them write a summary paragraph capturing all the action of the story in correct sequence.

4. Place limits on their summary paragraphs- for example 7 to 10 sentences in order to force them to be clear and concise.

**Grades 7-12 (or students at any level who require greater challenge)**

Older or more advanced students should be given more responsibility and should be required to read the entire story independently in addition to viewing the telling of the story in a cultural context by Johnny Arlee. They benefit from opportunities to analyze, compare and contrast stories, as well as developing understanding of how to determine the authenticity of a traditional story. Their task, beyond enjoying and comprehending the story, is critical literacy.

1. Older students need to read the story independently before viewing the DVD.

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**Maintain Expectations**

Be careful to maintain expectations for writing at all grade levels from the first day of Kindergarten. While you may not be able to read this “writing,” your students will tell you their intended message and over several months of daily writing, Kindergartners will emerge as writers and learn the fundamentals of the alphabetic principle along the way. Many Kindergartners don’t write because we don’t allow them risk-free opportunities to do so resulting from our beliefs about their abilities.
2. After their independent reading, have them write a summary paragraph capturing all the action of the story in correct sequence.

3. Place limits on their summary paragraphs—for example 7 to 10 sentences in order to force them to be clear and concise.

4. After this, have them view the entire 21-minute video on the Beaver Steals Fire DVD (Disk 2), including the section on relevance.

5. You may choose to provide an investigation revealing the Eurocentric genre labels that often misrepresent the religious and historic importance of traditional stories in American Indian cultures.

6. High school students might like to conduct a study comparing authentic stories coming from an oral tradition and authored by the tribe of origin, to contemporary “fake lore.” If interested in this investigation, check out the article Fakelore, Multiculturalism, and the Ethics of Children’s Literature by Eliot Singer which can be downloaded from the following website: https://www.msu.edu/user/singere/fakelore.html. It provides a powerful comparative discussion of the difference between authentic traditional stories coming from the oral traditions of different tribes and those created by non-Indian authors for commercial purposes.

7. For a different take or an additional support document for high school students related to the above investigation, check out the Debbie Reese’s blog http://americanindiansinchildrensliterature.blogspot.com/ which includes discussion and reviews of recently released children’s literature featuring American Indian themes. Located on the above blog, you will find a humorous article designed to get this point across: How to Turn a Traditional Indian Story into a Children’s Book (for fun and profit) by Beverly Slapin. It can be downloaded from http://americanindiansinchildrensliterature.blogspot.com/2007/07/beverly-slapins-how-to-turn-traditional.html. This article is a bruising tongue-in-cheek parody of a “How to...” guide that gets the point of ownership and authenticity associated with literature coming from the oral traditions of any tribe across to students and teachers alike. It is an opportunity to teach about parody, satire and irony.

References


**Exit Ticket**

**NAME** ____________________________________________  **DATE** __________

**WHAT DO YOU KNOW TODAY ABOUT THE TRADITIONAL USE OF FIRE? YOU HAVE 5 TO 10 MINUTES TO WRITE AS MUCH AS KNOW RIGHT NOW. GO!**
What is the Relevance of the Story?

According to the traditional beliefs of the Salish, the Creator put animal beings on the earth before humans. But the world was cold and dark because there was no fire on earth. The animal beings knew that one day human beings would arrive, and they wanted to make the world a better place for them, so they set off on a great quest to steal fire from the sky world and bring it to the earth. That is the story told in this book, a story that reminds us that while fire can be a destructive force, it is also a gift from the Creator brought to us by the animals.

In our tradition—that of the Salish and Pend d’Oreille of the northern Rockies—fire is a gift that can nurture life and that can be used to take care of the earth we have been entrusted with. It provides us with light and warmth. It makes it possible for us to cook our food. It is at the heart of our spiritual practice and at the very center of our traditional way of life. Before European-Americans arrived, it was the tool that our people used to intensively manage the lands where they lived. Our ancestors burned areas to increase food and medicinal plants. They burned to improve forage for game animals like deer, elk, bighorn sheep, buffalo, antelope, and bear. They used fire to hunt by building drivelines and game surrounds, and they used it in warfare, both offensively and defensively. They burned prairies and meadows to keep encroaching trees and brush at bay so that their horses would have plenty of grass. They groomed trails and cleaned their camps with fire.

For thousands of years our ancestors more than doubled the frequency of natural fires. Indeed, the plant and animal communities we have inherited today are in large measure the legacy of Indian burning. Those communities have adapted to fire, and many species are fire dependent. The point is, this early landscape was not a virgin landscape in the sense of being untouched by humans, but a cultural landscape shaped by thousands of years of tribal use of fire.

Salish tribal elder and historian John Peter Paul talked about the tribal person whose role it was to set fires. This man was called Sx̱páam, literally, “Makes Fire” or “Fire Setter.” He possessed an intimate knowledge of fire and its effects on plants and animals that he learned from his own experiences and that he inherited from generations of Sx̱páam before him. He knew that the diversity of plant species doubled after a fire and that if done properly, both wildlife and people would benefit from periodic burning. For example, he knew that the productivity of huckleberries increased dramatically about twenty-five years after a fire. Huckleberries were a staple not only of Indian people, but also of grizzly bears and black bears and dozens of birds and small mammals; all of them prospered from the periodic burning of huckleberry fields.

One need only look at photographs of the mountains in northwestern Montana taken 100 years ago and compare them with how those same mountains look today to see the profound influence that fire, both natural and Indian lit, had on these landscapes. As long as 230 years ago, the introduction of European diseases, and later, the growing presence of European-Americans themselves, gradually put a stop to traditional Indian burning practices in the Northern Rockies. By the late nineteenth century, Indian people who attempted to practice traditional burning encountered violent hostility and government repression from many non-Indian communities. Non-Indians also extinguished lightning-caused fires whenever they could. Since then, those fire-dependent landscapes have changed dramatically.

Place names in our language tell us much about the historic relationship between our tribe and the land. Indeed, place names are of great importance to our people, because they often record information about the cultural ecology—how the land was used and managed. In some cases, place names tell us where fire was used in beneficial ways to maximize plant and animal resources. But the place names—the oldest parts of our language that often come from Coyote stories and that talk about the making of this place or about resources—no longer have meaning because the places have changed so much in the absence of fire. Big Prairie in the South Fork of the Flathead is an example. What was a series of expansive clearings kept open by frequent burning is now just a little bit of prairie, and the surrounding park-like stands of ancient ponderosa pine are now dense with Douglas-fir trees. The place that was once an important camping area for Salish people bears little resemblance to what it once was.
Today, because we have excluded fires, we face many problems in our forests—the risk of catastrophic fire and very dangerous conditions in what land managers call the wildland-urban interface, the place where human settlements meet the forest. Many of these problems have their roots in our society’s failure to appreciate the depth and sophistication of the tribal relationship with the land and in particular tribal land management practices.

It takes a long time to create and maintain large old pine forests and open prairies. The landscape that was known and managed by the Salish and Pend d’Oreille people has changed dramatically. As a society, we are now trying to recover that older tribal landscape that took 12,000 years of habitation, experience, and occupation to create. The most basic question our society is faced with now as we attempt to return fire to the land in places where Indian people burned is, how do we do it? How do we restore that lost cultural landscape? The traditional tribal view of fire can enrich and inform the technical view of fire management. The traditional view draws from deep unseen roots—like the story told in this book—but it can nevertheless inform each new generation who learns to value it for themselves. The traditional tribal use of fire, and perhaps more importantly, the tribal view of fire, can provide guidance as we try to repair a landscape that science tells us is now at risk.

This story taught our children how difficult it was to bring fire from the sky world in the first place, and how important it was to animals and humans. Now it is time for humans to return the gift of fire to the animals.
3.1 What Do You See?

“If a Salish or Kootenai person who lived here two hundred years ago came back today and walked through his or her old forest haunts, they’d have trouble recognizing them. The forests have changed that much.”

— Steve Barrett, Fire Ecologist, 1995
3.2 What Do You See?

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3.3 What Do You See?

Cultural Value: Observation, Cooperation, Generosity

Rationale
Observation is a critical life skill. Observations over long periods of time, even across generations, inform our understandings of the world around us. To develop observation skills takes practice and the ability to look at both the forest, or big picture, and the trees – or tiniest details. In traditional life, observation is a critical survival skill. This lesson will help students gain awareness of what they see and perceive details with greater clarity and insight.

Learning Targets
- I look closely for details.
- I describe what I see to others.
- I compare two images to note differences, similarities, and become more aware of details in each.
- I work cooperatively with a partner or in a group.
- I write my descriptions with enough detail for others to create an accurate mental image.
- I accurately observe changes in the landscape.
- I can make an educated guess about possible causes of change in the landscape.

Resources
Fire on the Land DVD (Disk 1) or the Curriculum DVD (which contains the full contents of Disk 1)
PC or Mac with DVD player for each student group (possible use of library or lab setting to facilitate five groups or rotate groups through a single computer station over time)
Large piece of chart paper for each pair
Markers for each pair
Basket of apples, about a dozen more than the number of students in your class (McIntosh work well)
“Then and Now” pictures, one image per student; be sure to have matched pairs in the class set (attached at the end of this lesson)
Notebook paper
Pens or pencils

Instructional Techniques
Demonstration, observation of details in landscape images, partner discussion, descriptive writing, comparing and contrasting information, pairs present while teacher projects images from DVD gallery
3.4 What Do You See?

**Time Frame**

One or two 50-minute class periods depending on the nature of the student-led presentations and the grade level of the students.

**1st period** apple practice, image analysis, first descriptive paragraphs, partners, comparison, revised descriptive paragraph

**2nd period** chart with partner, report to class and discuss, exit tickets

**Suggested Grade Levels**

**Grades 2-12**

Procedures articulated below are targeted to the students in grades 5 to 8. However, with suggested adaptations following the procedures section, these may be useful for grades from 2 to 12.

**Procedures**

1. Bring to class a basket of apples, about a dozen more than you have students.
2. Have each student select an apple, but don’t let them eat it...yet.
3. Tell them they are going to examine the apple closely, looking for very specific distinct characteristics that might make their apple different from all the others. They must rely on the apple’s own appearance — they cannot make marks. Then they will return it to the basket.
4. Allow one minute for this observation.
5. Return the apples to the basket.
6. Next, have each student, based on their memory of the details of their apple, pick it out of the basket.
7. Once everyone has selected their apple, take turns going around the circle and have each student share what characteristic they observed that led them to select their apple.
8. Congratulate them all on their powers of observation. (Ask them to set the apples aside for washing before eating!)
9. Print “Then and Now” photos from *Fire on the Land*, one for each student (the photos are attached following this lesson.)
10. Be sure to have “matched pairs” of photos in your stack showing the same location, but taken at different times, and if you have an odd number of students, add a second copy of one of the photos. These will be used for making groups – either pairs or a trio as required. Some pairs may be duplicated more than once to make enough for everyone in your class.
11. Pass out a “Then” or “Now” photo from *Fire on the Land* to each student along with the attached observation form.
12. Tell them not to show their photo to anyone else.
13. Have them conduct a careful observation of what they see.
14. After a few minutes, ask them to write a descriptive paragraph on the attached response form under “Observation 1” or on notebook paper, with as much detail as they can discern, the more the better.
15. Tell them that they have a partner somewhere in the room with a similar, but not identical, photo taken of the same area.
16. Have them stand and mingle, sharing the images until they find their partner.
17. Remind them they must look closely to be sure the image is of the same location, but distinctly different from their partner’s photo. While the photos are not identical, they should be able to tell that the subjects and vantage point are the same.
18. Once students know their partner assignment, have them move to assigned tables or rearrange desks to accommodate partner seating.
19. Give each pair a large piece of chart paper and have them tape their photos side by side in the center of the chart paper.
20. Now, have them examine both photos side by side with care.
21. Next, direct students to use the middle section of their notebook paper or observation form and write a revised paragraph with what they can NOW see in their original photo. Allow five minutes or more.
22. When done, have partners share with each other their original and revised paragraphs. Each takes a turn.
23. Direct the pairs to analyze both photos and attempt an educated **guess** discussing the following questions:
   - Where do you think this was taken? Why?
   - When do you think this was taken? Why?
   - Look at the “big picture.”
   - What do you see?
   - Now look at the smallest details in the landscape.
   - What do you notice?
   - How were your observations different when you were looking at only one image?
   - Which image do you think was taken earlier? Why do you think so?
   - What do you think caused the differences you see between the two images?
24. Have students write their observations next to the photos on the chart paper.
25. Have each pair share their findings while you project the photos from *Fire on the Land* DVD “Then and Now” Photo Gallery so the entire class can see the images clearly. (To go to the gallery, just click the link at right and navigate to Photo Gallery>Then and Now Gallery.)

26. After each pair presents, open discussion to the class for a minute or two, asking them to look at similarities and differences in the images. The goal is to pull additional details forward for consideration.

27. Discuss details related to the images as each group presents. Focus your support on details not brought forward by the group. Ask questions to propel discussion.

28. After presentations, provide 5 or 10 minutes so each group can revise their charts with additional detail. Direct them to do this in a new color marker so they can see the progression of their observations.

29. Post their charts in the classroom for the duration of the unit.

30. Invite students to add new details that occur to them over time, using new marker colors to track their thinking.

31. In the last section of the observation form, or on the back of their notebook paper, close the class session by asking each student to write their best guess, hunch, or hypothesis as to why these two images are so different. What caused the change? Put names on the papers and turn in, allowing you to analyze their thinking for planning purposes later in the unit.

**Assessment**

- Direct observation of collaboration skills with partner
- Paragraphs before and after photo comparisons
- Charts with details comparing images
- Hunch, guess or theory regarding reason for change
- Direct observation of contributions to whole class discussion

**Adaptations**

The following adaptations are designed to support your efforts to meet the needs of every learner. Grade levels here are only a suggestion and would not preclude use of a great 3rd grade strategy with a 9th grader or vice versa.

**Grades K-3 (or students at any level who need more support)**

For younger students you may need to provide different supports and model the process. The following procedural options could be a place to start.

1. Model by projecting one image and then using a language experience approach to take dictation and write a descriptive paragraph on an overhead along with the class. Include details that are so specific they could pick out the picture in a “line up” in the event that they just had the paragraph in front of them.

2. Be sure to allow first through third graders to actually write their own descriptive observations with awareness of their developmental needs.

**Grades 7-12 (or students at any level who require greater challenge)**

Older or more advanced students should be given more responsibility; they can conduct research via the web links and the bibliography and resource section of the *Fire on the Land* DVD (Disk 1) and should be encouraged to develop personally or locally relevant projects coinciding with their study of *Fire on the Land*, including possibly vocational or service-related projects.
3.7 What Do You See?

1. Omit apple demonstration.
2. Have students swap their descriptive paragraphs before the partner work.
3. Post a single set of images on the walls.
4. See if students can determine the correct image from the detail provided in the description.
5. Do this again at the end of the partner comparison when they are able to “see more” in the image resulting from juxtaposition.
6. Are the descriptions clearer? Can they match to the images?

References

3.8 What Do You See?

Name: _____________________________________________ Date: ___________________________

Observation 1:

Observation 2:

What Happened? My Best Guess
3.9 What Do You See?
3.10 What Do You See?
3.11 What Do You See?
3.12 What Do You See?
3.13 What Do You See?
3.14 What Do You See?
What Do You See?
3.16 What Do You See?
3.18 What Do You See?
3.19 What Do You See?
3.20 What Do You See?
What Do You See?
3.22 What Do You See?
“Our survival as Indian people depended a lot on what was passed down...Fire was something that each family or each member knew about...and these things were shared amongst the Indian people.”

— Tony Incashola
Salish Pend d’Oreille
Culture Committee
Listen Up!

*Cultural Value: Listening, Respect, Observation*

**Rationale**
Listening attentively and deeply understanding the spoken words of another are essential skills and were the principal means of transmitting knowledge in the past. Today, listening skills have changed as many messages are transmitted in 30-second sound bites. Attention spans and the ability to retain information and make connections among different speakers, personal experiences and background knowledge have diminished. As Salish and Pend d’Oreille people, we continue to practice our oral traditions and value listening skills as essential to our way of life. This lesson is designed to help students develop and practice attentive, respectful listening.

**Learning Targets**
- I “turn my ear” toward the person who is talking, and/or look at him or her.
- I listen and don’t interrupt.
- I think about what the person is saying.
- I picture what the person is saying.
- I ask questions to find out more or understand.
- I nod, smile, or say something to show I understand.
- I repeat what I heard in my own words.
- I retell in my own words a personal story shared by a classmate with details in sequence.
- I state new ideas or understandings resulting from a story shared by a classmate.
- I retell in my own words a personal story shared by an elder with details in sequence.
- I summarize, using my listening skills, the consequences of fire suppression from this single personal example.
- I reflect on my own listening skills in order to improve.

**Resources**
Fire on the Land DVD (Disk 1) or use the Curriculum DVD (this DVD), which contains the full contents of Disk 1.
PC or Mac with DVD player
PC projector or Smart Board
Listening skills rubric (attached)
Listening feedback cards (attached)
Listening skills quick-reference cards (attached, optional)
Instructional Techniques
Whole class demonstration and practice, individual active listening to short segment of elder interview (once for dictation, then for gist—the main point or part, the essence), pair-share, whole class debrief.

Time Frame
One 50-minute class period. May vary based on age and grade level.

Suggested Grade Levels
Grades K-12
Procedures below are developed for students in grades 1 to 8. However, with suggested adaptations following the procedures section, these may be useful for grades from K to 12.

Procedures
1. Clear an area in the classroom.
2. Seat yourself and students in a circle on the floor.
3. Play the “telephone” game. Teacher and students whisper a statement from person to person moving around the circle. Instructions go like this:
   - “Next, we are going to do an activity called the Telephone Game. Some of you may have heard about or played this game before.”
   - “I have a statement that I am going to whisper into (name of first person)’s ear. S/he is going to whisper the statement into (name of second person)’s ear... We will pass the message around the circle clockwise.”
   - “The rules are that you must whisper and you can only say the statement once; no repeating is allowed! Whatever you hear, pass along the statement the best you can to the next person.”
   - “The last person will be (name of last person). When the statement comes around to that person, s/he will say aloud what s/he heard so we all can hear it.”
   - “Is everyone ready? I’ll start...”
4. At the end, compare the original message to the message stated by the last student in the circle. Discuss:
   - What happened?
   - How is it that (last person) heard “...” when the original statement was “...”? How often do we hear something very different than the message being shared by a speaker?
   - What rules of the game were responsible for the changes in the message or statement? (Possible answers: whispering, no repeating)
   - When people are really listening to you, how do you know? What are some ways they sit? What are some ways they talk? What are some ways they look at you? What does it feel like?
   - Do you think we can improve our listening and pass on the actual message being sent with practice?
   - What might we do differently?
5. Write students’ ideas to improve communication and listening on a piece of chart paper.

Increase the Benefit
Increase the benefit to students by carefully selecting the statements you use for the telephone game. Think of statements that reinforce a big idea or key fact central to the content of the lesson, remind students of a key behavior you hope they will practice, or make an announcement related to upcoming class activities.
6. If time allows, play the game again, but this time, have the students receiving the new message attempt to listen and pass on the message *word for word*. (Teach students the terms “literal” and “verbatim” here.)


8. If time allows, play the game a third time, but this time, have the students receiving the new message attempt to *paraphrase the message in their own words*... retaining the original meaning but making the message their own.


10. Share with students the learning targets for this lesson. At this time, you may want to hand out the self-assessment rubric (one per student) with the listening skills listed.

11. Review skills on the check list of good listening skills and compare to the students’ ideas to improve communication from the telephone game activity.

12. While they are still in the circle, tell students you will be requiring them to practice their listening skills by retaining a set of directions for the next activity. They will need to “Listen Up!” You may project instructions but do not allow students to “shout out” requests for clarification.

13. Here are the instructions:
   • Sit with a partner. (Teachers will want to make the pairs assigning role “A” OR “B” until students are practiced at this.)
   • Take a few minutes to think of a story... something you did or that happened to you. Your story can be funny or share an interesting experience you or a family member had, anything you would like to share. Your story needs to have at least 3 parts or significant details. Jot these on a piece of paper to help you remember.
   • Allow about 3 minutes to think of and record a story for sharing.
   • Partner A will be the story teller; Partner B will be the listener.
   • Partner A tells the story to Partner B. (Allow just 1 minute or so.)
   • Partner B uses the following script to retell the story told by Partner A (post on board).
     • “What I heard was...(repeat in your own words what you heard)”
     • “I am now aware that.....(a new awareness resulting from what you heard...)”
     • “Now I understand that...(a new understanding resulting from what you heard.)”
   • Using the Listening Feedback Cards provided to each pair (see attached) Partner A provides feedback to Partner B on the accuracy of his or her retell. (That’s it!, Not Quite, or Nope. Try Again.)
   • If “Not Quite, or Try Again,” Partner A repeats all or part of the story to clarify and Partner B attempts a repeat.
   • Repeat the entire process, shifting roles.

14. After both partners have a turn as teller and listener, have them complete self-assessment checklist you provided.

15. Debrief with the entire class.
   • What was it like to be the story teller?
   • How did you know your partner was paying attention to the story?
   • What was it like to be the listener?
   • Did you practice the skills we discussed in class?

16. Now test their skills.
17. Using the *Fire on the Land* DVD (Disk 1), locate and load the Elders Interviews. Go to the interview of Tony Incashola. (To go to the Incashola Interview, just click the link at right and navigate to Interviews>Elder Interviews>Tony Incashola.)

18. Play Tony’s response to the first question – (He is sharing a story about returning after years of fire suppression to a traditional berry picking area with his grandmother, only to find it so overgrown that she could not recognize it.)

19. Depending on the grade level and attention of your students, consider playing the audio without the video projecting so they are forced to use only their ears and not their eyes. The video will be shared during the “Elders and Fire” lesson if you are teaching the entire unit.

20. Have them listen to Tony’s response with their desks clear (no note-taking).

21. Now, using the skills they have developed during this lesson, have students write a short retell of Tony’s personal story using the prompts employed for the above partner activity.
   - “What I heard Tony say was (repeat in your own words what you heard)”
   - “I am now aware that (a new awareness resulting from what you heard)”
   - “Now I understand that (a new understanding resulting from what you heard.)”

22. Gather their self-assessment checklists and their written retell from Tony’s response to the first question to determine the level of student skill and the success of the lesson.
   - Examine the self-assessment rubrics for patterns of strength and weakness for the class and individual students.
     - Are there any patterns present?
     - Do you think they overestimate or underestimate their listening skills as a group? As individuals?
   - Look for any discrepancy between what students perceived about their own skill on the checklist and what they demonstrated in their written retell of Tony Incashola’s short personal story.
   - In addition, look for their awareness of the feelings or emotions experienced by Tony’s grandmother as well as their understanding of what had happened to cause the overgrowth of vegetation. Picking up on the emotions felt by others while listening is an indication of deep understanding and empathy.

23. Your observations will help you support their learning throughout the *Fire on the Land* Unit.

**Extension**

Once you have taught this lesson, spontaneously play the telephone game connected to big ideas and key content – or as a class surprise, periodically. Ask students to assess their own listening behavior after a guest speaker, assembly, or peer presentation using the attached rubric. Reuse the listening feedback cards and the pair-share activity anytime you want to support students in processing information presented in class, even following a traditional lecture or teacher-directed presentation of important new ideas or content. What a student speaks or writes will more likely be retained and used.
Assessment
- Direct observation of listening behavior.
- Chart of communication strategies.
- Direct observation of students accurately following instructions for partner activity.
- Peer feedback: That’s it! / Not Quite.... / Try Again.
- Self-assessment check list—What do good listeners do?
- Written retell of Tony Incashola’s story.

Adaptations
The following adaptations are designed to support your efforts to meet the needs of every learner. Grade levels here are only a suggestion and would not preclude use of a great 3rd grade strategy with a 9th grader or vice versa.

Grades K-3 (or students at any level who need more support)
Strong listening skills will support learners at all grade levels. Sometimes passive viewing and “screen time” diminish students’ awareness of the experience of a speaker or performer. As a teacher, have you ever seen students behave with a classroom guest as if that person were a media presentation rather than live? Respectful behavior as a member of an audience toward a story teller, speaker or performer is a skill that must be taught. Following are some ideas to support younger students learning to develop strong listening skills.

1. If it is winter, and depending on the order you have selected for the lessons, consider using the first 3 minutes of the Beaver Steals Fire DVD (Disk 2) featuring Johnny Arlee telling the story to children in a traditional setting.
   - Ask students to observe the behavior of the children on the video.
   - What do they notice?
   - What do the children do?
   - How does Johnny know they are attentive?
   - How do they “show” their respect?
   - Make a list of students’ observations on the board or chart paper.

2. Remind students of appropriate listening behaviors in advance of a guest speaker or performer coming to your classroom or school. Take time frequently to pre-teach and re-teach the listening skills found on the rubric.

3. Use the rubric provided here one time each week over the course of a year to have students reflect on their own skills and growth as good listeners.

4. Use pair-share strategies like the one articulated in this lesson frequently so children have opportunities to be both speakers and listeners, and opportunities to paraphrase or summarize information presented in class. Make this part of your classroom procedures to support deeper understanding of the content of a lesson while also building these skills.

5. Traditional approaches like “show and tell” and “author’s chair” are good opportunities to enhance student listening skills. Make students aware (meta-cognitively) of the skills involved and ask them to reflect on their application of those skills by using the rubric periodically.

Grades 4-6 (or students at any level who require greater challenge)
1. Require students to periodically (once a week or more) write a quick summary of a lesson, activity or lecture they experienced in class. You can tell them in advance, or increase the challenge by spontaneously requir-
Performing this “quick-write summary” for any content you want students to master and use. Like exit and admit tickets, these quick-writes allow you as a teacher to know what the students are taking away and also help the students develop awareness of their own learning. Students develop the habit of active listening when they know they will be held accountable for retelling, understanding, and applying the knowledge, skills, or abilities later. Use a timer for the quick-writes. A standard procedure goes like this:

- Write quickly and do not stop.
- Go! Create urgency. Allow just five minutes for the quick-write summarizing what was heard.

2. Sometimes students are hard pressed to summarize the spoken words of another, and they rarely know the difference between a verbatim retelling (literally word for word) and retaining the essence or gist of a spoken message. Provide a mini-lesson on the difference between these two approaches using the telephone game demonstration provided as options in the lesson above. Two things to note: It is hard to retain a word-for-word retell in short term memory long enough to be successful. It is much easier to retain the gist of a story or material presented in the form of a story. Have students discuss and explore why this is so.

3. Provide older students with the good listening skills quick-reference cards (attached at the end of this lesson) in advance of a guest speaker or performer. Have them practice these skills. (Attached at the end of this lesson)

**Grades 7-12 (or students at any level who require greater challenge)**

1. To adapt for older students, use the quick-write strategy above, but increase the complexity of the content heard. In addition, try this strategy with different types of audio input, perhaps including podcasts, music, etc.

2. Demand more structure for the retells including holding students accountable for technical writing skills, observation/listening notes, field notes, etc.

3. Don’t forget the key elements connected to the retell and work with older students to internalize so answering these questions becomes automatic:
   - What did he or she say? Retell
   - What does it mean? Broad interpretation
   - What does it mean to me? Personal interpretation
   - Why should I care? or Why is that important? So what? Value and Action

4. Provide older students with the good listening skills quick-reference cards (attached at the end of this lesson) in advance of a guest speaker or performer. Have them practice these skills (attached at the end of this lesson).

**References**


### Listening Rubric - Student Checklists (Cut Apart)

<table>
<thead>
<tr>
<th>Name:</th>
<th>Date:</th>
</tr>
</thead>
<tbody>
<tr>
<td>What do good listeners do?</td>
<td></td>
</tr>
<tr>
<td><strong>Look</strong> at the person who is talking, or turn your ear toward him/her.</td>
<td></td>
</tr>
<tr>
<td><strong>Listen</strong> and don’t interrupt.</td>
<td></td>
</tr>
<tr>
<td><strong>Think</strong> about what the person is saying.</td>
<td></td>
</tr>
<tr>
<td><strong>Picture</strong> what the person is saying.</td>
<td></td>
</tr>
<tr>
<td><strong>Ask</strong> questions, if appropriate, to find out more or understand.</td>
<td></td>
</tr>
<tr>
<td><strong>Nod</strong>, smile or say something to show you understand.</td>
<td></td>
</tr>
<tr>
<td><strong>Repeat</strong> what you heard in your own words.</td>
<td></td>
</tr>
</tbody>
</table>
Print 1 set for every pair of students and cut out.
### Good Listening Skills Quick Reference

- Show concern about what the speaker has to say.
- Give the speaker your full attention.
- Make eye contact if you feel comfortable with it.
- Lean forward toward the speaker.
- Do not interrupt, judge, or criticize the speaker.
- Use nonverbal skills: Nod or shake your head, change your facial expression as appropriate. For example: show concern or excitement.
- Use brief verbal responses that show you are listening such as “yes,” “I see,” “go on,” etc.
- Ask questions to clarify what the person is saying and to encourage the person to say more. For example: “So, what happened next? “How did you feel?” or “What did you think about that?”
- Try to figure out the feelings reflected by the speaker’s words. Ask a question to determine whether you are correct about how the speaker is feeling.
- Get feedback. Test how well you understand the speaker by sharing with the speaker what you think is being said.
“It is true that the people burned. It was said, when things would grow too dense they would get tangled. So when the people would go to these places to camp it was said that the people would burn the dense brush or growths, most often covering a pretty large area.”

— Felicite “Jim” McDonald
Salish Elder
The Elders and Fire

Cultural Value: Respect, Listening, Cooperation, Relatedness

Rationale
Our elders provide important information on the traditional use of fire that helps us understand the role of fire in creating and sustaining healthy forests. Careful listening is required if we are to learn from the experience of the elders and the generations that have gone before them.

Learning Targets
- I know at least five purposes for the traditional use of fire by Salish and Pend d'Oreille people.
- I understand the special knowledge and responsibility for the use of fire long ago.
- I know several reasons why the Tribes stopped using fire.
- I listen attentively.
- I summarize or paraphrase key ideas and information from an oral interview.
- I record information to remember and share with others.
- I work effectively and respectfully in a small group.
- I teach others what I have learned.

Resources
- Fire on the Land DVD (Disk 1) or you can use the Curriculum DVD (this DVD), which contains the full contents of Disk 1.
- PC or Mac with DVD player for each student group (possible use of library or lab setting to facilitate five groups or rotate groups through a single computer station over time)
- Large piece of chart paper for each group
- Markers for each group
- Questions handouts (optional)

Instructional Techniques
- Interpreting elder interviews from DVD, attentive and active listening, small-group process, summary and paraphrasing, comparing and contrasting information, small-group presentation, large-group discussion

Time Frame
Two to three 50-minute class periods, depending on the nature of the student-led presentations and the grade level of the students.

1st period
for initial research, first listening, small-group discussion, and second listening with chart development (layer 1 and part of layer 2, or procedure steps 1-9)
The Elders and Fire

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Markers for each group
Questions handouts (optional)

Instructional Techniques
Interpreting elder interviews from DVD, attentive and active listening, small-group process, summary and paraphrasing, comparing and contrasting information, small-group presentation, large-group discussion

Time Frame
Two to three 50-minute class periods, depending on the nature of the student-led presentations and the grade level of the students.

1st period for initial research, first listening, small-group discussion, and second listening with chart development (layer 1 and part of layer 2, or procedure steps 1-9)
2nd period devoted to completing chart, developing oral presentation, and possible delivery of presentation to class; if presentations are more formal or elaborate (Power Point, etc.) then the lesson will extend to a 3rd period (procedure steps 8-10, or, 8-14).

3rd period for small group presentations, whole-class discussion and debrief (procedure steps 10-14, as time allows).

Suggested Grade Levels

Grades 2-12

Procedures articulated below are targeted to the students in grades 5-8. However, with suggested adaptations following the procedures section, these may be useful for grades from 2 to 12.

Procedures
1. Place students into five groups of 3 to 5.
2. Assign each group to one of the elder interviews.

3. Each group will review the assigned interview on the Fire on the Land DVD (Disk 1) at a computer station in the classroom, lab, or library (click the button at right and navigate to Interviews>Elder Interviews).

4. At the introduction to each elder’s interview, groups should begin by taking a few minutes to read the biography of the elder that they have been assigned at the intro to each elder’s interview on the DVD.

5. Instruct the groups to listen to the entire interview with care all the way through before they begin discussing, summarizing and charting the elders’ responses. **Require them to do this with their ears only, no note-taking and no conversation.**

6. After first **listening** to the elder, ask the students to engage in a discussion. Questions for consideration (included in the handouts with this unit) might include:
   - How did ____________ learn about traditional use of fire by the Salish or Pend d’Oreille people?
   - Based on the interview, how was fire used?

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**Elder Interviews (roll over each for brief bios)**

Harriet Whitworth
Felicite McDonald
Tony Incashola
Michael Louis Durglo, Sr.
Louie Adams
Eneas Vanderburg

**Organizing Groups**

You may want to organize groups in advance to support differences in temperament as well as background knowledge and literacy. Generally, heterogeneous groups work best, but a group with one or two advanced students may be assigned to the longest interview – Tony Incashola. Students with strong listening and reading skills may be assigned to the interview of Harriet Whitworth and Felicite McDonald as it is in Salish with some English code-switching and English sub-titles. By contrast, the delightful interview of Eneas Vanderburg is brief and would allow artistic students additional time to represent the open forest and closed forest conditions he describes and the grass lands that were supported by frequent burning on their chart or poster.
• Based on the interview, why was fire used?
• Based on the interview, what was the effect of fire on the land, animals, or plants?
• What first-hand experiences were shared by the elder whose interview you watched?
• What did you learn about the life and the culture of the elder?

7. Allow time for discussion (about 10 minutes), then have them begin recording in blue their first impressions on the chart paper provided. Their selected format could be a list, a web, a mind map or story board or any other format of their choice. Invite them to provide as much detail as they remember, all with the blue marker, but remind them that they will be adding another layer of information or detail over the top of their blue notes.

8. Next, have students go back to the interview, and this time listen to the interview question by question. You may choose to give them individual data-capture forms with the interview questions (attached to this lesson). If so, have students write their response individually, then discuss it with their group. (See item 5 in adaptations section below for further suggestions.)

9. For each question, they will pause to add detail to their chart, this time, in red marker. Should they find that they have misunderstood or misrepresented aspects of the elder’s interview, they are free to place an “X” over the misquote. Ask them to leave the text under the “X” visible, rather than scribble it out. This allows you to track the evolution of their thinking and attention to detail and may support teaching points during the lesson connected to their listening.

10. When they are done with the second review of the interview, provide 10 minutes or more to prepare a five-minute presentation to the rest of the class on their findings. You may choose to have groups take an additional class period (or use time associated with computer instruction) to put together a 10- to 15-slide Power Point presentation.

11. Each group presents their findings to the rest of the class. You may prime the class to listen to their peers’ presentations, looking for similarities and differences among the elders’ interviews.

12. As they present, post their charts. These may remain and can be referred to throughout the remainder of your Fire on the Land unit as a reminder of the elders’ testimony and the oral histories that inform part of our current understanding about how fire was used by the Salish and Pend d’Oreille.

13. Follow up with a whole-class discussion of any details noted as differences (if any.) Pay close attention to the consistent similarities between each elder’s understanding of the use of fire, his or her personal experiences with its use, and the oral histories passed to them regarding traditional use of fire pre-dating the arrival of European-Americans in the Salish and Pend d’Oreille aboriginal territory.

14. The lesson can be extended throughout the unit by inviting students to watch and listen to the interviews of elders that were assigned to other groups during free time, down time, or when finished with other work. They can be invited to make comments on missing or supporting details they hear by making a note on a “post-it” and adding their comment or addition to the poster associated with that elder’s interview. In this way, they continue to interact with the ideas put forward by the elders as they are increasingly exposed to fire science and fire ecology.

Assessment
- Anchor charts show knowledge of purposes for the traditional use of fire.
- Anchor charts show significant detail, and differences in depth are evident from 1st listening to 2nd listening.
- Anchor charts indicate one or more reasons for the Tribes’ ending the use of fire in the past.
- Direct observation of listening behavior.
- Summaries gathered in data-capture forms, if used.
- Direct observation of effectiveness working as a member of a small group, including equity of contributions.
- Clarity and detail demonstrated in presentation to class.
- Observation of respectful behavior to members of each group as they present to whole class.
Adaptations

The following adaptations are designed to support your efforts to meet the needs of every learner. Grade levels here are only a suggestion and would not preclude use of a great 3rd grade strategy with a 9th grader or vice versa.

Grades K-3 (or students at any level who need more support)

For younger students you may need to provide different supports and model the process. The following procedural options could be a place to start.

1. Instead of starting with the small-group process outlined above, you may choose to conduct a whole-class demonstration using the longer and more complex interviews with Tony Incashola or Harriet Whitworth and Felicite McDonald. If you are working with younger students, say 1st or 2nd graders, you may go question by question having them listen with care, then discuss as a class or in pairs or groups, then summarize with them on the board, modeling literacy processes.

2. After you conduct a demonstration with one of the interviews in class, set them up in groups and have them follow the process outlined (2nd graders in particular) adjusting as required for differences in ability.

3. This same process could be conducted with whole-class participation, but using the much shorter interview of Eneas Vanderburg as the model, and then it may work even with kindergartners.

4. Always reinforce the very important value of attentive listening to the stories of the elders. Ask students to put away projects and objects and clear their desks so they can just listen to the first review of any of the interviews.

5. Attached to this lesson are data-capture forms that could be of help for 3rd- to 6th-grade students who struggle to stay focused. Do not allow the worksheets to be filled out while they listen to the elder in the first review. If they are filling out the handout, they are not actually engaged in active listening, one of the skills developed in this and the preceding lesson. If you select to use them, don’t hand them out until step 8 in the above procedures as they are beginning the second review. At this point, you can ask students to write their individual summary of the elder’s response to a question if you choose, before they engage in discussion and the second layer of their chart.

Grades 9-12 (or students at any level who require greater challenge)

Older or more advanced students should be given more responsibility and can conduct research via the web links and the bibliography and resource section of the Fire on the Land DVD (Disk 1); they should be encouraged to develop personally or locally relevant projects coinciding with their study of Fire on the Land, including possibly vocational or service-related projects. The final lesson in this Fire on the Land curriculum, titled “With Our Own Hands,” is a good example of a service learning project.

1. Require advanced reading. A good place to have students look is in the “Resources” section of the DVD (last tab on the yellow bar of the “Main” page of the DVD (Disk 1)). You will find several articles of interest, including the section of the bibliography on American Indian Use of Fire, which is particularly relevant to this lesson.

2. Here is a depth-of-study challenge: The entire Fire on the Land unit of study can be used as a local investigation bringing meaning and increased relevance to the essential questions, “How do human beings adapt to and interact with their environment to
enhance their survival and increase sustainability over time?” “Are humans apart from the ecosystems in which they live, or a part of the ecosystems in which they live?” Suggested content-area connections include world history, environmental science or biology, English, and algebra. Suggested companion books to support this extended study and bring forward new perspectives include 1491 by Charles C. Mann, Red Earth, White Lies by Vine Deloria, your world history textbook or your US history textbook. Critical literacy will be promoted through the juxtaposition of powerful, contrasting perspectives.

References

The following question sets are intended to be cut apart and provided to groups for discussion in step 4 of the procedures.

- How did Tony Incashola learn about traditional use of fire by the Salish or Pend d’Oreille people?
  - Based on the interview, how was fire used?
  - Based on the interview, why was fire used?
  - Based on the interview, what was the effect on the land, animals or plants?
  - What first-hand experience(s) were shared by the elder whose interview you watched?
  - Based on the retelling of this experience, what did you learn about the lives and the cultures of the elder(s)?

- How did Harriet Whitworth and Felicite “Jim” McDonald learn about traditional use of fire by the Salish or Pend d’Oreille people?
  - Based on the interview, how was fire used?
  - Based on the interview, why was fire used?
  - Based on the interview, what was the effect on the land, animals or plants?
  - What first-hand experience(s) were shared by the elder whose interview you watched?
  - Based on the retelling of this experience, what did you learn about the lives and the cultures of the elder(s)?

- How did Mike Durglo learn about traditional use of fire by the Salish or Pend d’Oreille people?
  - Based on the interview, how was fire used?
  - Based on the interview, why was fire used?
  - Based on the interview, what was the effect on the land, animals or plants?
  - What first-hand experience(s) were shared by the elder whose interview you watched?
  - Based on the retelling of this experience, what did you learn about the lives and the cultures of the elder(s)?

- How did Eneas Vanderburg learn about traditional use of fire by the Salish or Pend d’Oreille people?
  - Based on the interview, how was fire used?
  - Based on the interview, why was fire used?
  - Based on the interview, what was the effect on the land, animals or plants?
  - What first-hand experience(s) were shared by the elder whose interview you watched?
  - Based on the retelling of this experience, what did you learn about the lives and the cultures of the elder(s)?

- How did Louie Adams learn about traditional use of fire by the Salish or Pend d’Oreille people?
  - Based on the interview, how was fire used?
  - Based on the interview, why was fire used?
  - Based on the interview, what was the effect on the land, animals or plants?
  - What first-hand experience(s) were shared by the elder whose interview you watched?
  - Based on the retelling of this experience, what did you learn about the lives and the cultures of the elder(s)?
Harriet Whitworth and Felicite “Jim” McDonald

In what ways did the People use fire?

Where were the fall hunting places that you know had been burned?

Can you think of other places in the mountains that were burned, and what changes have occurred after 100 years of being forbidden to burn?

Can you give an example of how the burning was done?

Is the Bob Marshall more grown over now than when you were younger?

Did anyone put the fires out in the old days?

If they are going to burn again, what do you think would be the best way to do it?

So opening the woods and burning will help the deer and elk?

What do you remember about the animal herds from when you were younger?
Louie Adams

How was fire used by the Salish as part of their traditional way of life?

When you were growing up, what was the last time you heard of someone using fire in a traditional way?

What was lost when they put an end to traditional burning?

You worked in forestry. What kinds of changes have you seen in logs compared with when you were younger?

In your forestry work, do you see evidence of past fires?

Why is fire so important?

Did the concept of fire change because of the teachings of the Catholic Church and its association of fire with hell?

Are there plants that are now gone because of fire exclusion?

Have you been to traditional camping areas that have become overgrown because of fire exclusion?
How was fire used by the Salish as part of their traditional way of life?

What were some of the other uses of fire as a tool?

How did they know when to burn, and how was the knowledge passed on?

Can managers today use the same methods to reintroduce fire?

How have landscapes changed since you were young because of the absence of fire?

Can you talk more about the difference in attitudes toward fire among land managers today versus those of Indian people, especially in the past?

What kinds of plants and other things have disappeared because of the lack of fire?

Do you know of areas that were burned periodically when you were growing up?
Eneas Vanderburg

How was fire used in traditional times and how does that contrast with today?

Why was the burning done?

What happens now when there is a lightning fire?

How was fire transported from place to place during traditional times so it could be used as a tool for burning different areas?

Do you have memories from your childhood about using fire as a tool?
Antoine “Tony” Incashola

How was fire used by the Salish as part of their traditional way of life, and what happens culturally when fires are no longer allowed to burn?

How was fire used in the places your family camped when you were growing up?

You have said your grandmother burned your family’s camp area by the river to rid it of snakes and other pests. Is that right?

In traditional times, was there a leader in charge of fire?

What are some of the places where people used fire on the land?

What has been the consequence of excluding fire?

Are there placenames in our aboriginal territory that refer to fire or the relationship between people and fire?

Do the placenames used for millennia still describe those places?

How much have these places changed from the way they were in the times of our ancestors?
Can you talk specifically about how areas have changed because of the lack of fire? What have the elders said?

From a cultural standpoint, can you say why elders are concerned about the absence of fire?

How was fire used in hunting?

In what other ways was fire used?

Was fire important socially?

Was fire or smoke used to communicate?

How was smoke or fire used for signaling?

Do you recall your grandparents or your parents talking about the Catholic concept of fire, and how did that affect the Tribal view?
“Linguists say that many of the traditional placenames are among the oldest words in the Salish language...[and] have remained unchanged for centuries and in some cases millennia...a number of them offer testimony to the old fire-shaped landscape of western Montana.”

— Fire on the Land DVD
6.2 The Way We Were

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The Way We Were

Cultural Value: Relatedness, Cooperation, Observation

Rationale

Our people lived for countless centuries in a vast area that includes present-day Montana. Within this aboriginal territory, use of fire was recorded in our oral traditions, in the ancient placenames assigned by our people to the land, and in the old trees themselves. Fire served many purposes in the traditional life cycle of the Salish and Pend d’Oreille. In this lesson, students will learn about that life cycle, use of fire within it, and what the oral traditions, placenames, and trees tell us about the way we were.

Learning Targets

- I make inferences from several sources and my own background knowledge.
- I state many reasons why the Salish and Pend d’Oreille burned.
- I know the role of fire in the traditional life cycle of the Salish and Pend d’Oreille.
- I connect placenames to specific areas, along with the historical application of fire to that location by the Salish and Pend d’Oreille people.
- I demonstrate how data or information from many sources is “triangulated” to allow insight to events in the past.
- I summarize non-fiction text, developing a logical descriptive heading or title.
- I match titles already written to the article based on content.
- I work cooperatively in a small group.
- I read for a wide variety of purposes.

Resources

Fire on the Land DVD (Disk 1) or you can use the Curriculum DVD (this DVD), which contains the full contents of Disk 1.
Computer with DVD player for whole-group presentation
Speakers for computer
PC projector or electronic white board
Territory article – one copy for each student
Jigsaw materials (articles and images, etc.), one set per group of four (attached)
“Why Burn?” texts cut apart, one set per group of four
“Why Burn?” titles cut into strips, one set per group of four
Chart paper (one piece per group)
Markers (three colors per group)
Paper, cut horizontally into 1 ½ to 2 inch strips, for sentence strip headings
Individual field notebooks or notebook paper and pencils or pens for every student
Cush ball for summary game
Instructional Techniques
Whole-group direct instruction, small-group building background knowledge (BBK) workshop, summarization activity, whole-class debrief

Time Frame
1st period devoted to building background knowledge of territory, tenure, traditional cycle of life, tree rings, and placenames (procedure steps 1-27)

2nd period devoted to reasons for burning, crafting headings and matching headings as summaries, and summary ball (procedure steps 28-42)

Suggested Grade Levels
Grades 4-12
Procedures below target students in grades 5 to 8. However, with suggested adaptations following the procedures section, these may be useful for grades from 3 to 12.

Procedures
1st Period
1. Place students at tables in groups of four.
2. Provide a piece of chart paper and markers for each group.
3. Ask students to have field notebooks and pens or pencils ready.
4. Use your desktop PC connected to speakers (or to a projector with speakers with the screen toggled so only you can see the DVD images). Click the button at right and go to History>Traditional Culture>Cultural Geography section.
5. Tell students that you will be presenting to them a “mystery piece.”

6. Share the audio only of the placenames from Fire on the Land. Click over each name so students can hear each, without viewing the text or seeing the detailed map.

7. Require students to listen intently and not talk as they will be making inferences about what they hear.

8. Allow a few minutes (less than 5) for them to write in their field notebooks what they think this information is about.
   - What language?
   - What do they think it might be?
   - Have they heard anything like this before? Where? In what context?
   - Any logical guesses?

9. Draw a line under this initial thinking.
10. Add another clue to what the piece might be about.

11. Turn your projector on, but minimize the DVD and go to Google Earth. Project a terrain map of the State of Montana and/or a land status map from the Confederated Salish and Kootenai Tribes, which can be found at http://www.cskt.org/documents/tld/public_landstat06.pdf
12. Ask, with this second clue, now what do you think this mystery piece is about?
13. Allow five minutes for students in groups to discuss the audio from the DVD, and the map(s) presented.
14. Have groups brainstorm ideas in any format (webs, lists, etc.) using one color marker on the chart paper provided.
15. Pass out the attached article “Traditional Salish-Pend d’Oreille Territory”, (from the Fire on the Land DVD 1), one for each student.
16. Allow five minutes for them to read the article, text coding in the margins with an “N” to highlight information new to them.
17. Have groups discuss all the clues and information they have been provided so far.
18. Using a second color of marker, have groups layer what they now understand connecting the dots between the maps, the unknown words in Salish, and the short article on traditional territory. Now what do they think? Allow at least five minutes.
19. Pass out an envelope or folder to each group containing the following articles from the Fire on the Land DVD, images, or maps:
   - “A Cultural Geography of Fire”
   - “Tree Rings and Fire History”
   - “How Long Have the Tribes Been Here?”
   - “Traditional Salish and Pend d’Oreille Cycle of Life”
6.6 The Way We Were

- Map that includes aboriginal territory
- Image 1 (historic photo, traditional cycle of life, territory, forest succession stages)
- Image 2 (historic photo, traditional cycle of life, territory, forest succession stages)

20. Set a timer for 15 minutes.
21. Students take one article or image at a time from the center of the table, read or study it and when done, select another until all articles and images have been read or studied by each group member.
22. Remind students that there is no talking while the timer is up; all eyes are to be on the materials provided, searching for clues and connections to the material previously shared.
23. When the timer goes off, have students discuss what they now understand. After that, have them also begin, using the third color marker to add the third and final layer to what they now understand. The more details, dots connected, and information the better.
24. Once done, groups report their findings to the entire class one at a time.
25. Click the button at right and navigate to the section History>Traditional Culture>Cultural Geography and project the animated graphic of the map with its placename buttons.
26. Zoom in to increase the view of the placenames, with explanations and the map.
27. Go through the placenames one at a time, taking turns reading the descriptions aloud. Ask students if they have been to any of these locations. What did they notice?
28. Have students individually go back to their field notebooks. Below the line where they placed their original ideas, have them write what they now understand. Allow 10 minutes or more with time later in the day if possible.

2nd Period

29. Seat students in groups.
30. Provide each group with a packet containing eight short passages that detail the reasons for burning. These should be cut apart, with the headings removed.
31. Allow 15 minutes to read the passages.
32. Once done reading, tell students the passages are intended to be sub-sections of a larger document but will require headings.
33. Have students as a group re-read their assigned passages and write a heading that clearly describes the reason articulated in the passage for the use of fire. It needs to be brief and snappy, generating interest in the reader to continue reading.
34. Have each group write their passage on sentence strips and organize them at their table with each heading aligned to the passage it is intended to describe.
35. Invite the groups to shift to a new table, rotating several times until they have read all other groups’ headings.
36. Next, provide the groups the actual descriptive headings from the Fire on the Land DVD (Disk 1), cut into sentence strips.
37. Have students match the strip to the passage to which it belongs.
38. If time allows, this is a good activity to follow with a game of summary ball.
39. Have the class stand in a circle so they can play summary ball with a soft easy-to-catch cushion ball or ball of yarn.
40. The rules are: when you catch the ball, you must provide one reason stated by the Tribes for burning and one benefit of fire, then throw it to another classmate who must do the same without repeating the answer provided by the thrower.
41. The game progresses until the ball is very quickly passed from student to student and each is easily able to
provide a reason for and benefit of burning without repeating the reason stated by the person passing the ball to him/her.

42. In this way, students will remember the many of the reasons for burning and the benefits of the tribal use of fire.

43. Cap the lesson by reviewing information on the DVD as time allows.

**Assessment**

- Individual pre/post reflection captured in field notebook
- Group charts with three layers in three different colors, reflecting their growing understanding
- Sentence strip headings written for the “Why Burn?” articles
- Matching of actual section titles to “Why Burn?” articles
- Direct observation of recall and increasing speed recalling reasons during summary ball game

**Adaptations**

The following adaptations are designed to support your efforts to meet the needs of every learner. Grade levels here are only a suggestion and would not preclude use of a great 3rd grade strategy with a 9th grader or vice versa.

**Grades 3-4 (or students at any level who need more support)**

Younger students, or any student who struggles with reading, may need additional support. Here are several strategies to try.

- Provide or craft easier passages written at the instructional level of the lowest learners in a group.
- Be sure to provide support in the form of some text-free materials including maps, graphs, and charts.
- Structure the building background knowledge workshop with different reading materials for each small group based on reading levels.
- Structure readings so the students with the lowest reading proficiency read the simpler passages first and then progress to the more complicated passages as their background knowledge and confidence increase.

**Grades 9-12 (or students at any level who require greater challenge)**

High-school students as well as their younger middle-school counterparts would benefit from all aspects of this lesson.

1. Consider adding, or extending the materials to include a few more complex passages.
2. Consider assigning an independent research project to gifted students or those who need more challenge to stay engaged. *1491* by Charles Mann is a fascinating work of non-fiction that addresses use of fire by tribal people in this hemisphere prior to European contact.

**References**


A Cultural Geography of Fire

Fire was the most powerful tool by which Salish and Pend d’Oreille people shaped their land — and on a scale that was scarcely imagined by early non-Indians. It is also difficult to imagine today. The repression of fire, and the tribal use of fire, has erased a great deal of the fire-shaped landscape that once characterized much of western Montana, and also erased some of the tribal knowledge of how and where fire was used.

The Salish and Pend d’Oreille are making use of a wide range of methods and techniques to recover a vanished landscape. The landscape of the past is revealed through interviews with tribal elders, examination of tribal oral literature including Coyote stories, scouring of early archival records including fur trade journals, and scientific examination of surviving old growth trees that reveal the frequency and intensity of fires over the past several centuries.

But there is another technique that in some ways provides us with even more direct access to the fire-shaped world of traditional Salish and Pend d’Oreille life. Linguists say that many of the traditional placenames are among the oldest words in the Salish language, some of them even incorporating words or particles from proto-Salish or now extinct Salishan dialects. They are words that have remained unchanged for centuries and in some cases millennia. They are words that predate the changes of the last few centuries — including the virtual elimination of tribal use of fire. And because many of these placenames contain descriptions of the land, a number of them offer testimony to the old fire-shaped landscape of western Montana.

The Traditional Salish and Pend d’Oreille Cycle of Life

In the beginning, the people were taught by Coyote and the other animal-people how to live in a good way. Salish and Pend d’Oreille culture — the spirituality and cosmology, the mode of subsistence, the social organization — is centered around a relationship of respect with all creatures. Almost every elder speaks of how one of the most important ideals in the traditional way of life is to waste nothing and to take only what is needed.

Before the last 150 years, Salish and Pend d’Oreille people did not practice agriculture, and they did not raise domesticated animals other than dogs (and in more recent centuries, horses). They subsisted solely on wild game, fish, and plants. They lived as tribes, doing many things communally or in family groups. Tribal people owned little personal property, and there was no concept of individual ownership of land. The people gathered enough food and medicine and material things for their own use, and perhaps a little to exchange with others. This was an economic system based more on subsistence need than profit motive, a system profoundly different from what predominates today. And that over arching structure of Salish-Pend d’Oreille life, that cultural and economic and social system, helped determine the way that tribal people shaped and took care of the forests and grasslands through the use of fire.

Like most tribal hunter-fisher-gatherers around the world, the Salish and Pend d’Oreille had an intimate understanding of their territory and its resources, and they drew upon that extremely detailed body of knowledge in ensuring a stable and reliable sustenance. They did not wander randomly across their vast lands, as some early non-Indians thought. Rather, they had a widespread and ancient network of trails, and thousands of placenames identifying specific areas. They also were not simply the passive recipients of the foods of nature, as many of the strangers and visitors assumed. Tribal people knew in great detail which foods or medicines or materials could be reliably harvested at which places, at which times of year, and by which methods. They had an elegant technology perfectly suited to these tasks. And of course, one of their most powerful tools was fire, and they systematically used this tool to nurture and sustain the resources that nurtured and sustained them.
The Salish and Pend d’Oreille lived by a predictable and precise cycle of life through the months and seasons. The people followed this cycle, beginning with spring and the holding of the bitterroot ceremony to give thanks for this first of the year’s major foods. In early summer, camas was the next staple to be harvested, followed by huckleberries and other fruits of summer. In early fall, chokecherries were an important wild crop. And throughout the four seasons, people hunted and fished, drawing from the abundant game herds and rich fisheries of their traditional territories.

In each of these seasons of the year, across all the varied lands of Salish and Pend d’Oreille territory, the people used fire as an integral part of that traditional way of life — one of the most sustainable and stable ways of life the world has ever seen.

How Long Have the Tribes Been Here?

In the traditional stories, Coyote prepared this land for the Salish and Pend d’Oreille, and he left behind landmarks to remind the people of his deeds. Throughout the immense Salish-Pend d’Oreille aboriginal territory, many of the land formations — even entire valleys, rivers, mountains, and lakes — are tied to these ancient stories of creation and transformation.

In this sense, the legends of Coyote and the other animal people provide us with clues about how long the people have been here — about the great age of the Salish and Pend d’Oreille ties to this land. For in the stories themselves, we can find uncanny descriptions of what non-Indian geologists also say happened during the last ice age: the extension of the glaciers down what is now Flathead Lake, the flooding of western Montana beneath a great lake (now referred to by geologists as Glacial Lake Missoula), and the breaking up of the ice dam that contained those waters.

The stories tell of the gradual retreat, advance, and then final retreat of the bitter cold weather as the ice age came to an end. They also describe the disappearance of large animals like giant beaver and woolly mammoths, and their replacement by the present-day smaller versions of those creatures. Archaeologists have documented sites within the aboriginal territory that corroborate these stories, reflecting a continuous tribal occupancy reaching back to about the time of the end of the last ice age.

That is a long time to live in one place. It is a long time for a people to learn at the deepest level about the land, the waters, the plants, and animals, about their cycles of scarcity and abundance over both short and long periods of time. It is partly through that long tenure, and through the integrity and fidelity of their oral traditions that passed teachings down from generation to generation, that Salish and Pend d’Oreille people were able to master the use of fire, to learn how to use it in a largely beneficial way.

Traditional Salish-Pend d’Oreille Territory

The Salish and Pend d’Oreille people practiced their way of life across an immense territory.

Before the changes of the past few hundred years, the Seliš (Salish or “Flathead”) were organized in at least five major bands spread throughout Montana from the Bitterroot Valley to the Yellowstone. Epidemics and war with Great Plains tribes led to the eventual concentration of the Salish in the Bitterroot Valley portion of their aboriginal territory.

The Qlispé (Kalispel or Pend d’Oreille) are close relations and neighbors of the Salish and speak a closely related dialect of the Salish language. They were traditionally organized in a number of bands based in the vast drainage system of the Clark’s Fork River, ranging from the numerous forks of the Flathead River and the Flathead Lake area downstream to the Lower Clark’s Fork, Lake Pend d’Oreille and the Pend d’Oreille River.

There was also a related tribe of the Salishan family called the Tuńx̣án that lived east of the Continental Divide, along the Rocky Mountain Front. They were later virtually eliminated by epidemics of smallpox.
All of these tribes utilized a far larger area for hunting, fishing, and gathering plants. Buffalo hunting parties often ventured east of present day Billings, north to Canada, and south to Wyoming, all areas that they regarded as common hunting grounds. Fishing, gathering, and trading parties have always ventured west into what is now Washington state. Indeed, Elders tell of how the tribes of the Salish language family, stretching west all the way to the Pacific Coast, were in the distant past one nation, and that is why to this day they are friends, allies, and relations of the Montana Salishan tribes.

For millennia, much of this sprawling territory was actively managed by the Tribes through the frequent use of fire.

Tree Rings and Fire History

In recent years, forest scientists have added greatly to what the elders have long told us about tribal use of fire by examining the tree rings of many surviving old growth ponderosa pines, western larches, and other trees in western Montana. They have discovered that these trees tell us much about the frequency and kind of fires that Salish, Pend d’Oreille, and Kootenai people set over many years in western Montana.

Most of the ancient ponderosas and larches the scientists have studied date to the 1500s, 1600s, or 1700s; a few of the very oldest of the trees began growing in the 1300s and 1400s. Across western Montana, primarily in ponderosa forests, the rings of these trees show signs of fires at average intervals of between 5 and 30 years, depending on forest type, elevation, and topography. In most places, these fires were far too frequent to have been caused by lightning; the tree rings are direct evidence of native use of fire.

This means that for many forests across Salish-Pend d’Oreille territory, and for many centuries, tribal people set frequent fires, but did not ignite “stand-replacement” fires (meaning fires that burn all the trees in a given area). The old trees survive to this day because the Indian fires were low-intensity surface burns that did not kill mature fire resistant ponderosa and larch, but did remove the brushy undergrowth that if not removed could threaten them later. The big trees in a literal sense were, as Stephen Arno has written, the “result of frequent fires.”
We know from the elders that tribal people intentionally used fire to reduce the risk of more serious fires. Salish elder Louise Combs (1900-2005) told this to researcher Stephen Barrett in 1981, explaining that it was a practice “passed down through generations.” In an interview recorded in the Salish language in 2002, Salish elder Felicite “Jim” McDonald echoed Louise, recalling, “It is true that the people burned. It was said, when things would grow too dense they would get tangled. So when the people would go to these places to camp it was said that the people would burn the dense brush or growths, most often covering a pretty large area.” Louie Adams summarized it succinctly: “When things got too brushed out, they burned it off.”

To tribal people, places that are “cleaned up” in this way look good. It is how the forests should look — big old trees towering above, with clear ground underneath, airy and easy for traveling and hunting and berry picking. Interviews and research among other native communities have shown that this aesthetic, the creation of a “fine and beautiful open country,” is an important aspect in the tribal use of fire.

Where the people lived, around traditional camp areas, burning was employed even more intensively — to “keep it clean,” as Mike Durglo Sr. says. Tony Incashola recalls large extended family trips in the fall of each year to the Flathead River, how “as we got there and did our hunting and fishing or whatever is necessary, and before we left...my grandmother....She would burn it and then let it spread out, because she knew that it wouldn’t go far because as long as she continued to do this every year, that [it] wouldn’t get brushy. And then the next year we’d go back, it would be all clear. It would be nice and green, and the area would be cleared out with the brush, the underbrush. So she always made sure. And so after our hunt, she’d set fire and we’d stay there maybe an extra day or so just to watch — just to make sure that what she wanted to do, to burn, made sure it burnt before we left.” Salish people did much the same thing in the Ninemile Valley, according to the recollection of an early non-Indian settler.

Beginning in the early eighteenth century, tribal people had another reason to burn: to provide better and more pasture for horses. The goal was to “sweeten up the grasses” for their horses, as Pend d’Oreille-Nez Perce elder Larry Parker told researcher Steve Barrett in 1981. Felicite McDonald recalls, “That was also what I heard; it was for the people’s horses, so the grass, the hay would grow good.” She remembers camping with her family in the reservation area called Big Knife. “We had horses, and when we moved someone would turn back and say, ‘We are going to go back and burn the field where the horses were so the grass will grow back good.’” Eneas Vanderburg notes that “any place where it’s been burnt a year or so ago...Boy, they just turn green and come right up wherever there’s been fire.”

Especially along lengthier trails, such as the Lolo Trail, tribal people made sure that around major camps, the undergrowth was regularly burned so that the grass would be luxuriant and plentiful for the horses when weary parties stopped during their long journeys.
Tribal people used fire to ease traveling and clear paths of downed timber; as Salish elder Harriet Whitworth said, “In the fall, when the wind would knock trees down and block trails....we would come out from the mountains [and] a fire would be started behind us so next year we would have a good trail.”

Of course, long ago there were no trail crews — and no saws — and so the burning of deadfall was done as necessary, and when possible, by tribal parties as they happened to ride through the mountains. That is one reason why the journals of many early non-Indian visitors remark on trails being so varied in their condition; in a single day, they would ride easily through areas burned and cleared of downed trees, and then suddenly run into places not yet cleared that were nearly impassable.

It also seems that on long trails, particularly through heavily forested mountains, tribal people focused fire management on traditional camps where they could help ensure good grass for horses. They knew where these places were, and could manage their journeys accordingly. When Lewis and Clark were returning over the Lolo Trail, for example, their native guides pressed them on to ensure that they would make camp where their were open grassy areas for the horses — probably places shaped through the long tribal use of fire. This was one of the most ancient and important of travel routes for both Salish and Nez Perce people. On June 28, 1806, Meriwether Lewis wrote that the expedition’s horses “look extremly gant this morning, however the indians informed us that at noon we would arrive at a place where there was good food for them.” They arrived at eleven o’clock and found “an abundance of grass for our horses as the Indians had informed us.” These camps were separated by long stretches of the trail where there was virtually no grass and at times extensive downed timber.

As a result of the sporadic nature of traditional fire maintenance, there was in many places a stark contrast between the openness of trails and the dense brushiness of nearby woods. When visitors and strangers came to Salish-Pend d’Oreille land, they often lost their way in the unfamiliar country (often in areas of extensive downed timber), and once off the trail would in many cases have trouble even passing through “impenetrible” forests. On their trip to the Pacific, Lewis and Clark tried to cross the Bitterroot Mountains on the Lolo trail with a Shoshone guide who did not know western Montana very well. He got the party lost and they almost didn’t survive. But on the return trip, led by a knowledgeable Nez Perce guide, the expedition had little difficulty. Similarly, when the fur trapper John Work was traveling up the Blackfoot River in October 1831, he remarked repeatedly on the “good” road, until somewhere near Ovando, where “we missed the road, and passed through a bad part of the woods.” The difference was night and day. These non-Indian travelers may not have realized they were seeing the difference between the presence and absence of fire on the land, but their journals provide us with evidence of exactly that distinction.

One of the most important tribal uses of fire was to nurture certain food and medicinal plants. As Felicite McDonald has related, this was the Indian way of “pruning” the vast patches of huckleberries that were harvested in the summertime.

“It was said that some of the women-folks would say ‘Hoy, the huckleberry bushes have really grown and they are pretty tall so that the berries do not grow well.’ It was said that then two people would be chosen to go burn beneath the huckleberry bushes. Then that area would be burned - but not with a real hot fire. It was said that that area would be left alone for about two years at which time the bushes would then have regrown to a certain height. It is said that then the huckleberries would be plentiful like as if it could be said in English ‘You pruned them, (the bushes).’ I guess after that the huckleberries would grow well again.”

Huckleberries were one of only many plants that were intentionally replenished with the careful application of fire. Across the northwest, there are extensive records of Indian people burning to enhance wild crops of many other berries, as well as roots and bulbs such as camas, and countless plants used for medicinal purposes. And as Eneas Vanderburg has noted, tribal people were also well aware that the ashes from light burning “will fertilize all the growth.”
Tribal people used fire to make better conditions for hunting; as Louie Adams has told us, they knew that “when a place is burnt off you also get food back for the animals, the wildlife — not only the medicinal plants for our people, but food for the wildlife.” “From what I heard from my grandparents,” Louie recalls, “whenever they had a favorite picking area, a huckleberry picking area or a root digging area, and when it got too brushed in, they’d burn it off. And they didn’t worry about the fire spreading to other places. But...when you say camp areas, that takes in all the land, you know. Because our people went all over...when I say favorite huckleberry picking areas...this is including hunting areas. Because...if...the timber gets too stagnated, nothing grows there anymore, including food for animals. So our people knew this; all of our older people knew this.”

In the written record, we can find glimpses of other tribal uses of fire as an aid in hunting.

About 1840, the Jesuit missionary Nicholas Point painted Coeur d'Alenes using a fire surround to hunt deer, and in 1940, the anthropologist Claude Schaeffer described the Kootenais using a similar technique. But tribal people also employed subtler ways of using fire to harvest game. In the fall of 1860, an engineer named P.M. Engle was working under Lieutenant John Mullan on construction of the first road through the region — a military track running from Fort Walla Walla, on the lower Snake River, to Fort Benton, on the Missouri River. In northern Idaho, as they approached what is now the Montana border, Engle asked a Coeur d'Alene man to guide his party to the crest of the Coeur d'Alene Mountains, where they hoped to get a better view of the surrounding country and assess the various potential routes for the road. Unfortunately, smoke from wildfires was so dense they could see nothing. They turned around to go back down, and to Engle’s undoubted consternation, the guide then “set fire to the woods himself.” The engineer then distinguished himself from virtually every non-Indian contemporary who saw native people using fire: he evidently thought to ask the Coeur d'Alene guide why he was doing it, and he regarded the answer as important enough to write down. The guide told Engle that he was setting fire to the forest “with a view to destroy a certain kind of long moss...which the deer feed on in the winter season. By burning this moss the deer are obliged to descend into the valleys for food, and thus [the people in the winter camps] have a chance to kill them.”

The Coeur d'Alene guide was explaining to the engineer how tribal people were using fire as a form of fencing. They were using fire indirectly to move game herds towards their camps. (In reporting back to Mullan, Engle, unfortunately, reverted to the usual non-Indian assumptions regarding fire when he represented the “whole country” as “burned and the grass destroyed.”)

Other tribes may have accomplished a similar effect on the Great Plains by burning extensive areas and thus leading bison toward the dwindling remaining patches of green. In the early spring of 1793, Canadian trapper and trader Peter Fidler traveled throughout the Alberta buffalo country, watching Indian people torch enormous areas and then noticing “a few Bull Buffalo here & there on small spots unburnt.” Fidler noted that the burning was intentional. “The lightning in the Spring & Fall frequently light the Grass,” he wrote, “& in the winter it is done by Indians.” And he also understood that the Indians’ main reason for “burning off the old grass, [was that] in the ensuing Spring & Summer [it] makes excellent fine sweet feed for the Horses & Buffalo, &c.” Fidler vividly described the sheer spectacle of prairie fires:

“Every fall & spring, & even in the winter when there is no snow, these large plains either in one place or other is constantly on fire, & when the Grass happens to be long & the wind high, the sight is grand & awful, & it drives along with amazing swiftness, indeed several Indians I have heard being burnt in this manner to death, the fire coming upon them in the night when asleep. The flames roars along like the waves in the ocean in a storm.”
Tribal people also used fire for communication and signaling. In 1831, fur trapper William Ferris was traveling from the Big Hole Valley west across Lemhi Pass toward the Lemhi and Salmon River country in Idaho. “From the summit,” he wrote, “we saw a dense cloud of smoke rising from the plains forty or fifty miles to the southeastward, which we supposed to have been raised by the Flatheads, who accompanied Fontanelle to Cache Valley, and who were now in quest of the village to which they belong. The Indians with us answered the signal by firing a quantity of fallen pines on the summit of a high mountain.”

A quarter century earlier, members of the Lewis and Clark expedition witnessed the same use of fire by Salish people as the expedition passed near the Lemhi River, just before they crossed over into Ross’s Hole and met the Salish for the first time. “This day warm and Sultry,” wrote Clark. “Praries or open Valies on fire in Several places— The Countrey is Set on fire for the purpose of Collecting the different bands, and a Band of the Flatheads to go to the Missouri where They intend passing the winter near the Buffalow.”

Ferris also saw the Salish use fire to signal their arrival home in the Bitterroot Valley. Fire was often used in ways that served a dual purpose; it seems from the following account, in which the group travels through a fire-shaped landscape of intermittent prairies and open timber, that the Salish were already burning for other reasons, but they took advantage of the chance to also let the people in the winter camps around K’łqetmiš (the area of Stevensville, Montana) know that they were coming home:

As we arose on the morning of the 11th of August [1833], we discovered a smoke rising above the pines in the mountains...we...then descended the steep north side, to the head of Bitter Root river... Next morning a Flat-head came to our camp...under his guidance we passed down the river into a little valley, then over a high mountain point, and finally descended into a small prairie bottom, where we found the comrades of our guide...At dark we halted on a small fork near the river [West Fork], which has greatly increased in magnitude, and here skirts an open plain, several miles in extent on the east side, but a narrow irregular one, covered with dense pine timber, forming the base of the mountain, on the other.

On the 13th, we continued down this river [the Bitterroot], till evening and halted on it. The Indians with us, announced our arrival in this country by firing the prairies. The flames ran over the neighboring hills with great violence, sweeping all before them, above the surface of the ground except the rocks, and filling the air with clouds of smoke.
Print a set for each group on colored paper. Cut apart to create title strips.

“Burning the Dense Brush”

“A Fine and Beautiful Open Country”

“Sweetening Up the Grasses”: Fire and Horses

“Announcing Our Arrival in this Country”: Fire and Communication

“Our People Knew This”: Fire and Hunting

“Keeping it Clean”

“Burning Beneath the Huckleberry Bushes”

“Making a Good Trail”
Image 1. Historical photo (circa 1908).
“The history of fire now being revealed challenges and even overturns many basic and long-held assumptions about how Indian people used fire to manage the land both before and after the arrival of European-Americans.”

— Fire on the Land DVD
Rationale
The land and our people are linked and inseparable. As Salish and Pend d'Oreille people, we were a part of, not apart from, the environment that we helped shape. This unit engages students in research to achieve an understanding of historical events in the lives of the Salish and Pend d'Oreille and the effect these events had on our use of fire on the land.

Learning Targets

- I understand how trees record the occurrence of fire and the weather conditions that they experience each year they live.
- I navigate the Fire on the Land DVD or website, locating information and recording notes on findings.
- I describe the effect of various historical events on tribal use of fire.
- I chronologically organize information, creating a timeline.
- I use both text and images to accurately tell the story of a historical event in the form of a poster. My telling includes at least seven significant details.
- I design a poster that accurately depicts the impact of a historical event on the use of fire on the land.
- I design a poster that is visually appealing, while also being informative.
- I place my topic or event along a time continuum and within the context of other events.
- I research my event using Fire on the Land and other sources, citing them with accuracy.

Resources
- Fire on the Land DVD (Disk 1) or you can use the Curriculum DVD (this DVD), which contains the full contents of Disk 1.
- Computer with DVD player for whole-group presentations and use of library or lab setting (preferably with head phones) to allow individual or partner research on assigned topic
- PC projector or projector and electronic white board
- Blank paper, one sheet per student for four-square layered notes
- Copy of each article: Horses, Disease and Guns – one per student
- Treasure hunt form, one per student
- Print and cut apart topic slips for drawing topics and determining partners
- PowerPoint notes instructions (as desired, one per pair)
- Poster board and art supplies for preparing posters
Change for the People, Change for the Land

Cultural Value: Relatedness, Cooperation, Observation

Rationale
The land and our people are linked and inseparable. As Salish and Pend d’Oreille people, we were a part of, not apart from, the environment that we helped shape. This unit engages students in research to achieve an understanding of historical events in the lives of the Salish and Pend d’Oreille and the effect these events had on our use of fire on the land.

Learning Targets
- I understand how trees record the occurrence of fire and the weather conditions that they experience each year they live.
- I navigate the Fire on the Land DVD or website, locating information and recording notes on findings.
- I describe the effect of various historical events on tribal use of fire.
- I chronologically organize information, creating a timeline.
- I use both text and images to accurately tell the story of a historical event in the form of a poster. My telling includes at least seven significant details.
- I design a poster that accurately depicts the impact of a historical event on the use of fire on the land.
- I design a poster that is visually appealing, while also being informative.
- I place my topic or event along a time continuum and within the context of other events.
- I research my event using Fire on the Land and other sources, citing them with accuracy.

Resources
Fire on the Land DVD (Disk 1) or you can use the Curriculum DVD (this DVD), which contains the full contents of Disk 1.
Computer with DVD player for whole-group presentations and use of library or lab setting (preferably with head phones) to allow individual or partner research on assigned topic
PC projector or projector and electronic white board
Blank paper, one sheet per student for four-square layered notes
Copy of each article: Horses, Disease and Guns – one per student
Treasure hunt form, one per student
Print and cut apart topic slips for drawing topics and determining partners
PowerPoint notes instructions (as desired, one per pair)
Poster board and art supplies for preparing posters
Instructional Techniques
Four-square layered reflection connecting text to text, technology-driven treasure hunt using DVD, partner research project on historical event, partner poster project, hosted gallery walk

Time Frame
Seven 50-minute periods; however, this material is so rich in history, social studies concepts and literacy strategies that it would warrant implementation as full-day or half-day replacement lessons covering multiple content areas over five to ten days’ time and overlapping with other lessons in this unit.

1st period four-square layered reading, activate prior knowledge, examine three changes impacting traditional life (procedure steps 1-15)

2nd period treasure hunt using DVD, teach navigation skills while reviewing and previewing content important to post-project assignment (procedure steps 16-25)

3rd period partners take on poster assignments and begin research (procedure steps 25-33)

4th – 6th periods partners continue research, gathering information for poster projects, develop “effect on fire” highlight for posters, design and assemble poster projects (procedure steps 34-41)

7th period partners present their posters in a “gallery walk” format to their class (and others) (procedure steps 42-47)

Suggested Grade Levels
Grades 4-12
Procedures articulated below are targeted to the students in grades 5 to 8. However, with suggested adaptations following the procedures section, these may be useful for grades from 4 to 12.

Procedures
1st Period
1. Open class whole group, click the button at right and project:
   History>Traditional Culture>Tree Rings.
2. Invite a student to read the text from this section aloud. If no one opts to read, read it to them.
3. Have students examine the tree rings that have been analyzed for evidence of fire. What do they notice? When was this tree alive? If the tree had eyes, what changes might it have seen?
4. Have student take a sheet of paper and fold it into quarters.

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<table>
<thead>
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5. In the first square, have students independently write what changes they think the tree might have witnessed.
6. Use the “Quick Write” protocol to facilitate thoughtful predictions in writing here:
   - Set writing timer for five minutes (or less).
   - Write quickly and do not stop.
   - This is what you think now. There are no wrong answers.
   - Go! Create urgency.
7. Once the timer goes off, pass out the article on Horses (attached). Allow students five minutes or so to read the article silently, then discuss with a neighbor.
8. In the second square, have them add a layer to what they now understand about changes that may have occurred in the life of the tree.
9. Pass out the article on Disease (attached). Again, allow students five minutes to read it then discuss with a neighbor.
10. In the third square, have them add a third layer to what they now understand about the changes that occurred during the life of the tree.
11. Repeat for the third article on Guns (attached).
12. Once all four layers of the four-square sheet have been filled, place students in small groups to discuss their findings and observations.
13. Debrief with the entire class by again going to the Fire on the Land tree-ring analysis. Look closely at the life span of the tree. Each ring records events from the tree’s perspective—weather including heavy rain and high snow pack, drought, and fire are all noted in the growth patterns of the tree. Ask:
   - What would be included for the time span from 1752 to 1902 if human events - or history, could also be recorded in the growth rings of a tree?
   - What do you already know beyond Horses, Guns and Disease that happened during those years?
   - What, if any, human events did you note in your first square when asked what changes this tree might have “witnessed”?
14. On the back of their four-square paper, have students extend their brainstorm, listing historic events that they believe occurred between 1752 and 1902.
15. You may want to collect their ideas and record on chart paper to connect to events in the history of the Salish and Pend d’Oreille later.

**BIG EVENTS UNRELATED TO THE TOPIC**

Answers will likely include “big events” unrelated to the topic. However, any events occurring during this time period such as the Revolutionary War, the Civil War, the signing of the Declaration of Independence, Montana statehood are welcome. All details for which students can estimate a date for will help build a chronology and schema for the next part lesson. Their responses to these questions will also help you as a teacher gauge what they know or understand regarding history in general.

16. Reconvene class in a library, classroom with access to multiple computers, or in a computer lab setting. Ideally, students should have a 2-to-1 or 1-to-1 student-to-computer ratio for the next part of this lesson.
17. Seat students individually or in pairs at a computer loaded with the Fire on the Land DVD or go to [http://www.cskt.org/fire_history.swf](http://www.cskt.org/fire_history.swf) to connect to Fire on the Land from the web.
18. Conduct a treasure hunt assignment in order to support students in navigating the Fire on the Land material and review or preview material already or still to be addressed. Here are the instructions.
• Working independently or in pairs, locate the following items:
  □ A timeline
  □ A map
  □ A fire management plan
  □ Journal entry from 1793
  □ A picture of Chief Charlo
  □ Definition of “disturbance”
  □ Description of what happens when a fire is spotted
  □ A detail from a prescribed burn plan
  □ The name of a tree that needs fire, and why
  □ Definition of “lethal fire” or “stand-replacement fire”
  □ The name of one lookout located on the Flathead Reservation
  □ The name of an eye witness to the Great Fires of 1910

19. For each item on this list, you must collect information to “prove” that you have been there.
   • Note its location on the site or DVD including major tab and sub tab and sub-sub tab (for example History>Traditional Culture>Territory)
   • Jot down one important fact that can be found only at that location, answer a question posed, or provide a descriptive detail.

20. Provide an opportunity to share out loud with the whole class the findings of the pairs or individuals.
21. Debrief item by item, projecting the Fire on the Land DVD, while students share their findings.
22. End the period by having students draw topics for history poster projects from a jar or container. Cut slips from the table attached to this lesson for that purpose, making sure you have two slips of paper for each of the following historical events discussed under History on the Fire on the Land DVD. Fold them and drop into a jar or container to be drawn by students. Manipulate numbers so you end up with even pairs or one team of three. You may also hold a topic or two to assign as independent work for a student requiring greater independence and challenge. Adjust assignment to accommodate your class and individual needs. Topics are:
   • Fur Trade
   • Fire Observation
   • Missionaries
   • Treaty
   • Power
   • Railroads
   • Bitterroot Removal
   • Swan Massacre
   • 1910 Great Fires
   • What Caused the 1910 Fires?
   • After 1910: Suppressing Dissent and Fire
   • Fire, Forestry, and Sovereignty
   • Global Warming

23. Each student draws a slip and then mingles through the classroom to determine who else has their topic. In this way, partners are determined for the poster project and events are assigned.
24. Rearrange desks to accommodate partner seating in preparation for the next day.
25. Brief students on the poster project as time allows.
3rd Period

26. Launch poster projects (ideally in the computer lab) using partner seating with pairs determined by random assignment of topics from the preceding day.

27. Establish each pair as an expert team charged with researching background information on their assigned topic.

28. Their task is to answer the following questions through their research and present a summary of this historical event in the form of a poster to be shared with others.
   - What happened?
   - When did it happen?
   - Who was involved?
   - Where did it happen?
   - Why did it happen?
   - How did this event impact use of fire?

29. Provide a mini-lesson on note-taking and citing sources.

30. Students may take notes on index cards or use a version of the PowerPoint strategy taught in the “Impacts and Opportunities” lesson. Detailed instructions are attached to this lesson.

31. Have students organize notes using the 5W’s + H (Who, What, Where, When, Why and How)

32. Provide groups with the entire class period to begin researching their topic. They can start with the Fire on the Land DVD, and then expand their research using in-class reference materials, maps, the Internet, and possibly the school library to locate sources.

33. Following is a list of helpful sources:
   - Fire on the Land: An Interactive Educational DVD
   - Challenge to Survive: History of the Salish Tribes of the Flathead Reservation Unit I Pre-1800 From Time Immemorial: Traditional Life (Vol. 1)
   - Challenge to Survive: History of the Salish Tribes of the Flathead Reservation Unit II 1800-1840 Three Eagles and Grizzly Bear Looking Up Period (Vol. 2)
   - Challenge to Survive: History of the Salish Tribes of the Flathead Indian Reservation Unit III 1840-1870 Victor and Alexander Period (Vol. 3)
   - The Lower Flathead River, Flathead Reservation, Montana: A Cultural, Historical and Scientific Resource
   - A Brief History of the Salish and Pend d’Oreille Tribes
   - The Salish People and the Lewis and Clarke Expedition
   - The Swan Massacre: A Story of the Pend d’Oreille People (Publication pending)

4th – 6th Periods (or spaced over 5 to 10 days)

34. Try the “Fire Alarm!” strategy to divide and conquer large projects or tasks:
   - Over the five-to-ten school days after the assignment has been given, set a classroom alarm clock (your computer will work for this) for a random time each day. Be mindful of the times so you don’t interrupt a key point in your teaching!
   - Keep the times a secret as the element of surprise makes this strategy effective.
• Teach students in advance the following protocol for the “Fire Alarm!” strategy.
• When the alarm goes off, tell students to **Stop! Drop Everything! Roll into Research Mode!**
  • You may work quietly with your partner (a variation for this project from the *Impacts and Opportunities* unit)
  • You have 15 minutes, with only the resources available in class, to find a resource, read for 10 minutes and then record in your own words a key fact, element of the story or episode or version of the event you have been assigned.
  • Paraphrase or quote what you learned in your notes associated with Who, What, Where, When, Why and How questions for your project.
  • Note the source of this information in your works cited list (author, source title, source type, copyright date, page number, etc.)
• Return to your seat before the timer goes off!

36. Try this strategy at random times daily for several days in order to allow time for reading and research, and also to break up a larger project, keeping students from feeling overwhelmed.
37. If you notice students are all on task and on a roll with their project, find ways to stretch the time at least until they finish the task at hand.
38. Adjust the timer to accommodate your students. Your goal is excitement and purposeful urgency, not panic or chaos.
39. Consider the “Fire Alarm!” strategy in addition to allowing longer periods of class time to conduct research.
40. Once they have conducted enough research to have ideas regarding presentation of their findings on a poster, provide a mini-lesson with the Poster Project Instructions and the Rubric so students know what their finished project must include.
41. Establish a deadline for the project allowing class time and also anticipating homework on the project in order to complete the design, layout and ultimate completion of the poster project.

**7th Period (5 to 10 days later)**
42. With poster project completed, have partners assemble in a school hallway (you could select to adapt this to your classroom or another space in the building) and organize themselves in chronological sequence, hanging the posters on the walls.
43. Have students allow enough space in their “walking timeline” so a group of students can cluster around a single poster to hear a presentation by its authors.
44. With your class, and possibly other class groups, conduct a hosted gallery walk of the hallway timeline.
45. Starting from the earliest date and moving to the present, students move from poster to poster while the partners responsible for each poster provide a 3- to 5-minute presentation on the historical event they researched.
46. Encourage partners to write note cards with the highlights of the story to help them stay true to the facts and present key information with confidence.
47. Leave the posters up for a week or more, inviting students from your class and others to walk through time, learning critical events in the history of the Salish and Pend d’Oreille and how those events impacted the use of fire on the land.

**Assessment**
- Four-square forms for work on horses, guns, and disease
- Treasure hunt form with details
- Posters and support materials (presentation notes, bibliographies, etc.) for poster sessions
Observation of poster session presentations
Feedback rubrics

Extension
1. Once pairs have developed their posters, create a shared Google Doc presentation and insert 17 slides.
2. Have partners review their knowledge of the historical event by developing a slide on it with a bullet for each question, including how fire use was impacted.
3. Be sure the event title appears in the slide title.
4. You may ask students to omit the date on the slide (so Great Fires instead of Great Fire of 1910.)
5. The Google Doc will allow many teams to edit at the same time as long as they are on different slides or objects.
6. Have individuals needing more challenge take on creation of slides for Guns, Horses, and Disease as well as Traditional Cycle of Life, Tenure, and Territory.
7. Again, omit dates at this time.
8. When all slides are completed, scramble the order of the slides in the presentation.
9. Have students in groups reorder the events to create the chronology of the Salish and Pend d’Oreille people. This culminating task reinforces what was learned and also tests their knowledge.
10. Have students add dates or date ranges when done.
11. Share with other classes.

Adaptations
The following adaptations are designed to support your efforts to meet the needs of every learner. Grade levels here are only a suggestion and would not preclude use of a great 3rd grade strategy with a 9th grader or vice versa.

Grades 3-4 (or students at any level who need more support)
1. Reduce the amount and complexity of the reading in all aspects of this investigation to accommodate the reading levels of younger students.
2. Introduce relatively easy reading first and build to more difficult texts as students build schema over time.
3. Make groups heterogeneous, allowing students with a variety of skill levels and unique abilities to work cooperatively and build off each others’ strengths. Carefully balance groups based on skills and personality to support younger students in complex tasks or projects.

Grades 9-12 (or students at any level who require greater challenge)
1. Required older students to work independently.
2. Have students take on the additional responsibility for teaching their carefully reviewed poster session to younger students (high school students can go to a middle school, middle school students can present to upper elementary students, etc.).
3. Establish minimums for citations and require careful documentation of sources and a complete bibliography for the poster session.
4. Teach a lesson on source authority, reliability and authenticity.
References


Salish-Pend d’Oreille Culture Committee and Elders’ Cultural Advisory Council, Confederated Salish and Kootenai Tribes. (Publication Pending). The Swan Massacre: A Story of the Pend d’Oreille People. Lincoln: University of Nebraska Press.
Horses

Sometime between 1650 and 1730, the Salish and Pend d’Oreille acquired horses. There are vivid stories in the recorded oral tradition of the Tribes first acquiring donkeys and horses from neighboring tribes — through raids on the Shoshone, and through trade with the Nez Perce.

Horses gave tribal people much greater mobility, and easier access to buffalo and other foods and materials. The Tribes quickly and fully integrated horses into the traditional way of life, from the seasonal round to the spiritual ways and songs. The Salish and Pend d’Oreille were able to visit neighboring tribes more often, and intermarriage, particularly with the allied tribes to the west, increased.

However, the horses also made it easier and faster to travel into the territory of enemy tribes. And horses themselves were a newly mobile unit of wealth, prestige, and power. Once stolen, they not only could be transported quickly — they were the transportation. As a result, with horses came a dramatic increase in conflict and warfare with enemy tribes. The Tribes here were known as expert breeders who developed very fine horses, and they became particularly coveted targets for Blackfeet raiders.

Horses affected the tribal use of fire in a number of ways. The horse population here increased rapidly, and horses need pasture — and pasture was created and maintained with fire. But how much pasture was needed beyond what was already present under pre-horse fire regimes? We don’t yet have a clear answer.

With the increase in inter-tribal raids, it also appears that there may have been an increase in accidental fire, or at least fires not set for a specific beneficial purpose. There may have also been an increase in fires set as a part of conflict and war; even the Coyote stories mention this offensive use of fire. There are numerous anecdotes in fur trade journals in which people come across the apparent campfires of raiding parties, hastily abandoned and still smoldering or burning. But were these exceptional incidents or part of a pattern? We don’t yet know that either.

More research needs to be done to better understand the relationship between the establishment of horses among tribes and the traditional use of fire.
Epidemic Diseases

Long before the Salish and Pend d’Oreille encountered non-Indian people, they had already been visited by European diseases that were spread through intertribal contact. Native people had little or no immunity against many of these diseases. And it is possible that the deadliest of them all, smallpox, may have swept through the Inland Northwest and decimated tribal populations throughout the region as early as the 1500s—a full 150 to 200 years before the first appearance of horses. That epidemic, if it happened, would have started with the Spanish conquistadores in Mexico and spread northward through preexisting tribal social and economic networks.

In any case, it is clear that after horses were here, repeated epidemics struck the various tribes throughout the 1700s and 1800s. Horses helped disease spread, because infected people traveling on foot might have died before reaching a village; but now, speeding along on horseback, ill people survived long enough to unwittingly spread their sickness to others.

Before the diseases, there were many Salish and Pend d’Oreille people—an educated guess is that number was somewhere between 20,000 and 60,000. The original population of Salish and Pend d’Oreille people was probably greater than the number of non-Indians who inhabited the area until after completion of the transcontinental railroad in 1883.

But because of the diseases, only a tiny fraction of the original tribal population remained to witness the arrival of Euro-American people—and to defend their tribal territories against non-Indian incursions. The first documented epidemic in Salish-Pend d’Oreille territory arrived between 1774 and 1782. Historical demographers estimate that in those last years of the 1700s, somewhere between half and three-quarters of the total population of Salish-speaking tribes died from introduced diseases. Oral histories tell of particular bands from which only a single person survived. By the time Lewis and Clark arrived in 1805, there were only 2,000 to 8,000 Salish and Pend d’Oreille people left.

Both elder accounts and fur-trader journals note that the epidemics swept through with so heavy a toll that whole herds of horses were left roaming certain areas and became wild; the Salish and Pend d’Oreille still asserted ownership of them, but they were no longer domesticated.

We can only begin to imagine how devastating the epidemics were to tribal society. Fragmentary oral histories tell us that some bands had no survivors, others only a few.

But what were the impacts of these epidemics on the traditional use of fire? Archaeologists have found some changes in fire regimes that coincide with the timing of some epidemics, but the evidence remains spotty. Some ancient trees seem to show an increase in intervals between fires after 1782. Were there less frequent but bigger fires after that time due to a radically reduced population—a sudden loss of tribal knowledge and/or manpower—and thus a loss of control over fire? What was the cumulative effect on fire regimes of, on the one hand, epidemics and dwindling human populations, and on the other, of rising horse populations? We don’t yet know. More research needs to be done, including comparative analysis of more trees across a larger area.
Firearms

In addition to horses and disease, the introduction of firearms also changed the inter-tribal world. The Hudson’s Bay Company began establishing trading posts on the upper branches of the Saskatchewan River in the late nineteenth century, including Cumberland House in 1774, Buckingham House in 1792, and Fort Edmonton in 1795. From that time on, the Blackfeet, who were the principal tribal adversaries of the Salish and Pend d’Oreille, had ready access to firearms. For the following 20 to 40 years, Salish warriors suffered heavy casualties, until they acquired sufficient firearms to overcome their disadvantage.

Because the Blackfeet obtained firearms at the same time that epidemics were devastating the western tribes, they had an even more destructive effect. The Tuňáxn, a Salishan people who lived on the Rocky Mountain Front, were virtually exterminated by the combined impact of disease and firearms. The Blackfeet also pushed Plains Shoshone bands to the south and west. The Salish were compelled to make major changes. Before the epidemics, and before horses and guns, the Salish occupied nearly as much territory east of the Continental Divide as west. But Salish numbers were now decimated. Armed with superior weapons, the Blackfeet swept into the northern Montana plains, forcing the plains bands of Salish, Pend d’Oreille, Kootenai, and Shoshone to move their winter camps west and south across the mountains. The western tribes continued to use their ancestral buffalo hunting grounds east of the mountains, but with the constant threat of Blackfeet raids, they could no longer live there permanently. This is why during the mid-nineteenth century the Salish and Pend d’Oreille, Salishan tribes from further west, the Nez Perce, and the Kootenai would gather together, forming large multi-tribal hunting parties as they ventured east across the mountains for buffalo.

By destabilizing the inter-tribal world, the introduction of firearms had an indirect effect on the tribal use of fire. Raids parties doubtless set fire with less concern or care, if not with offensive intent, in the territory of their enemies. Losses of population from warfare, like losses from epidemics, probably affected the use of fire by reducing the number of knowledgeable and able-bodied people available to manage the burning. And in the bigger picture, the combined effects of firearms and epidemic diseases made it far more difficult for tribes to resist incursions into tribal territories by fur traders and the other non-Indians. Those larger changes ultimately led to the marginalization of native people and native ways of life — including the traditional use of fire.
### Treasure Hunt – Fire on the Land

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<thead>
<tr>
<th>Find....</th>
<th>Where .... Major tab, sub-tab, sub-sub tab</th>
<th>Quote, interesting fact, detail or answer - proof you have been there!</th>
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<tbody>
<tr>
<td>A timeline</td>
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<td>A map</td>
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<tr>
<td>A fire management plan</td>
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<td>Journal entry from 1793</td>
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<tr>
<td>A picture of Chief Charlo</td>
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<tr>
<td>Definition of “disturbance”</td>
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<tr>
<td>Description of what happens when a fire is spotted</td>
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<td>A detail from a prescribed burn plan</td>
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<tr>
<td>The name of a tree that needs fire, and why</td>
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<tr>
<td>Definition of “slop-over”</td>
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<tr>
<td>The name of one lookout located on the Flathead Reservation</td>
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<tr>
<td>The name of an eye witness to the Great Fires of 1910</td>
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</table>
Cut on the dotted lines, fold and place in container to draw topic assignments and create pairs.

<table>
<thead>
<tr>
<th>Fur Trade</th>
<th>Fur Trade</th>
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<tbody>
<tr>
<td>Fire Observation</td>
<td>Fire Observation</td>
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<td>Missionaries</td>
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<td>Treaty</td>
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<td>Power</td>
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<td>Railroads</td>
<td>Railroads</td>
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<td>Bitterroot Removal</td>
<td>Bitterroot Removal</td>
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<td>Swan Massacre</td>
<td>Swan Massacre</td>
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<td>1910 Great Fires</td>
<td>1910 Great Fires</td>
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<tr>
<td>What Caused the 1910 Fires?</td>
<td>What Caused the 1910 Fires?</td>
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<tr>
<td>After 1910: Suppressing Dissent &amp; Fire</td>
<td>After 1910: Suppressing Dissent &amp; Fire</td>
</tr>
<tr>
<td>Fire, Forestry, and Sovereignty</td>
<td>Fire, Forestry, and Sovereignty</td>
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<tr>
<td>Global Warming</td>
<td>Global Warming</td>
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Poster Project Instructions

Student Directions

With a partner, you will be assigned a historical event to research and eventually present to the class and others in the form of a poster. Your poster must use text, graphics and images to tell the story of the event you have been assigned. It must be historically accurate and include a list of references or sources cited. It must be attractive and engaging—in the way a museum display is designed to engage the viewer in history and maintain attention. You and your partner will act as experts, presenting your poster to your class and possibly others as part of a hosted gallery walk at the end of the project. Your poster must include the following required elements and provide answers to the following questions.

- What happened?
- When did it happen?
- Who was involved?
- Where did it happen?
- Why did it happen?
- How did this event impact use of fire?
- Sources cited
- At least 3 images, graphics or maps (created or borrowed and cited)
- An appealing layout that is easy to read
- Indication of date or date range for the event in large text at the top
- Event title in large text at the top

You will be graded according to the rubric.
Rubric for Historical Event Poster Project

<table>
<thead>
<tr>
<th>CATEGORY</th>
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<th>3</th>
<th>2</th>
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<tbody>
<tr>
<td>Required Elements</td>
<td>The poster includes all required elements as well as additional information.</td>
<td>All required elements are included on the poster.</td>
<td>All but 1 of the required elements are included on the poster.</td>
<td>Several required elements were missing.</td>
</tr>
<tr>
<td>Content - Accuracy</td>
<td>At least 7 accurate facts are displayed on the poster.</td>
<td>5-6 accurate facts are displayed on the poster.</td>
<td>3-4 accurate facts are displayed on the poster.</td>
<td>Less than 3 accurate facts are displayed on the poster.</td>
</tr>
<tr>
<td>Knowledge Gained</td>
<td>Student can accurately answer all questions (5W’s) related to facts in the poster and sources of those facts.</td>
<td>Student can accurately answer most questions (5W’s) related to facts in the poster and sources of those facts.</td>
<td>Student can accurately answer some questions (5W’s) related to facts in the poster and sources of those facts.</td>
<td>Student appears to have insufficient knowledge about the facts or sources of those facts.</td>
</tr>
<tr>
<td>Graphics - Originality</td>
<td>Several of the graphics used on the poster reflect an exceptional degree of student creativity in their creation and/or display.</td>
<td>One or two of the graphics used on the poster reflect student creativity in their creation and/or display.</td>
<td>The graphics are made by the student, but are based on the designs or ideas of others.</td>
<td>No graphics made by the student are included.</td>
</tr>
<tr>
<td>Graphics - Relevance</td>
<td>All graphics are related to the topic and make it easier to understand. All borrowed graphics have a source citation.</td>
<td>All graphics are related to the topic and most make it easier to understand. All borrowed graphics have a source citation.</td>
<td>All graphics relate to the topic. Most borrowed graphics have a source citation.</td>
<td>Graphics do not relate to the topic OR several borrowed graphics do not have a source citation.</td>
</tr>
<tr>
<td>Attractiveness</td>
<td>The poster is exceptionally attractive in terms of design, layout, and neatness.</td>
<td>The poster is acceptably attractive in terms of design, layout and neatness.</td>
<td>The poster is acceptably attractive though it may be a bit messy.</td>
<td>The poster is distractingly messy or very poorly designed. It is not attractive.</td>
</tr>
</tbody>
</table>
Scaffold for Note-Taking Using PowerPoint

**Student Directions - Check as you go!**

- Open a blank PowerPoint presentation file.
- Insert 6 or 7 slides, or one for each of the Five W’s that you will be researching related to the historical event: Who, What, When Where and Why plus a How slide for impacts on fire use and a References or Sources slide. Make sure each inserted slide uses the bulleted list format.
- On each slide, write the question word along with the context. For example: What happened in 1910? Why did it happen? Who was involved? Where did it happen?
- Now, as you research your topic, take notes in this PowerPoint presentation, writing a phrase or sentence on the appropriate slide for each detail or fact you find. Each note will be a bullet on the list.
- Note the author’s last name, if known, or title of the text or website (if author not known) next to each detail you add to any slide in the body of your report. This will make it easy to cite your sources later.
- Keep a list of the different sources you use; on a references or works cited slide, write the author, title, magazine, website, etc. and page number, publisher, and copyright year.
- When you are done with your research and have collected notes on each slide that answer each guiding question, revise your notes to be complete sentences. Each sentence will be a bullet on the list.
- Run the presentation to check for organization.
- Reorder your slides using slide sorter or your bullets (select, drop and drag) within any slide to follow a logical pattern. This is the revision step in the writing process.
- Next, from “normal view”, which allows you to see the slide in the editor, as well as the 6 slides you have created along with left side of the screen, convert from showing the slides to the “outline” view on the left side.
- While in “outline” view, you can correct spelling in the presentation using spell checker.
- Re-read the text for strong and specific word choice.
- Re-read the text to be sure sentences are complete (no fragments, no run-ons.)
- If you have a personal editing list or have a standard editing checklist, use it to be sure you have applied what you know about the rules of grammar and spelling.
- Save your PowerPoint.
- Print your presentation as a six-slide-per-page, black-and-white handout for reference.
- With the information you have collected on the PowerPoint slides, you can now begin designing your poster to present the story of the event to your class.
“That is why my elders—my father’s father and beyond—that is why they would burn: for the animals and for the huckleberries and the medicines.”

— John Peter Paul
Pend d’Oreille elder
8.3 Impacts and Opportunities

Impacts and Opportunities

Cultural Value: Relatedness, Observation

Rationale
Elders know some plants and animals are more abundant after fire and some are unchanged, while others decrease in number. A variety of habitats are necessary to support animals and plants, and fire is one tool used to create disturbances that result in many different forest and prairie types. In this lesson, students explore the lifeways and needs of a plant or animal—and the role fire plays in creating its home.

Learning Targets
1. I work independently.
2. I know how to use the library and internet sources to research a topic.
3. I develop a report, PowerPoint or other product to teach others.
4. I use technology as a tool for both research and sharing the findings of my research.
5. I research one plant or animal, its habitat and how that habitat is shaped by fire by locating sources, reading sources, taking notes from sources, and crediting sources.
6. I understand the role of disturbance in the creation of ecosystem variety necessary to support diverse plants and animals.
7. I write a descriptive paragraph from a photo.
8. I use notes from various sources to answer questions about a plant or animal.
9. I organize my report using question/answer format and a logical sequence.
10. I cite sources and create a works-cited or references page.
11. I apply research strategies.
12. I use the writing process to share my results.

Resources
Fire on the Land DVD (Disk 1) or you can use the Curriculum DVD (this DVD), which contains the full contents of Disk 1.
Computer with DVD player for whole-group presentation and possible use of library or lab setting to allow individual word processing or development of PowerPoint or other presentation form
PC Projector or electronic white-board
Library access
Access to the Internet for advanced research
Blogs, Wiki’s, or classroom Moodles to publish and share reports (optional)

Instructional Techniques
Independent research, note taking, writing, publishing and sharing with class.
**Time Frame**

1st period to introduce the project, teach research skills, launch independent work, and allow for intermittent, independent work time over the next week or two to allow for project development.

2nd period direct instruction or practice (mini-lessons) on topics like paraphrasing, citing sources, creating a reference or works cited list, plagiarism and fair use (science, communication arts, library/media time all work well)

3rd period about 5 to 10 days after the introduction, to present findings to class, publish or post

**PowerPoint (PP) as an Organizing Tool**

Some students struggle to organize their ideas when writing. To help, you can invite students to use PowerPoint as a tool for organizing a report. The structure will support and prompt them, sentence by sentence, through the writing process. Keep in mind they can use the paragraph-per-slide model suggested here, or they can make each slide a full section of a longer report, with the title box, the heading, and each major bullet the topic sentence of a distinct paragraph. Technical reports, like science fair projects, lend themselves wonderfully to use of PP as a scaffold. Instructions are found in a handout at the end of this lesson.

**Suggested Grade Levels**

Grades 2-12

The procedures that follow target students in grades 3 to 6 or students of any age who struggle with writing or have limited practice writing and researching topics. However, with suggested adaptations following the procedures section, these may be useful for grades from 2 to 12.
8.5 Impacts and Opportunities

Procedures

1. Provide direct instruction starting with the *Fire on the Land* DVD on disturbance and its role in creating habitat for plants and animals.

2. Click the button at right and go to Fire Ecology>Fire Concepts>Disturbance

3. Discuss how different plants and animals require unique qualities on the land in order to make a home.

4. Inform students that they will each be creating a report on a plant or animal that includes how it is impacted by fire, which will later be shared with the class.

5. Distribute the student assignment sheet provided.

6. Assign plants or animals from our region found under Fire Ecology>Fire Effects: Plants, or Fire Effects: Animals from the DVD.

7. Allow students to choose a plant or animal from the lists found on the *Fire on the Land* DVD.

8. Have students brainstorm what they need to know about their plants or animals. They can do this individually, in pairs, or in small groups.

9. Have students convert their brainstorm list into four or five guiding questions. For example:
   - What does ___________ look like?
   - Where does ___________ live?
   - How does ___________ behave? (animal), or
   - How is __________ used? By what or whom? (plant or animal)
   - What does __________ eat or require?
   - How does fire affect ____________?

10. Each question will become a paragraph of this simple report.

11. Ask students where they would go to find this information. Use the *Fire on the Land* DVD as an example of a source that they will all have on their list of sources and future works-cited list.

12. Write their ideas on information sources on the board.

13. Next, teach students how to take notes related to each guiding question. They can use note cards, a section in their field notebook, or use the PowerPoint note-taking strategy found at the end of this lesson.

14. Remind students that they are to paraphrase information from sources and must always note the source (author, title, year published, publisher, and the page number) where they found an answer to one of their questions. These will be noted as “Works Cited” at the end of their paper and will be cited within the text of their report. This is a critical habit that must be reinforced as Internet plagiarism becomes an ever-increasing problem.

15. Provide a mini-lesson on paraphrasing:
   - Define paraphrasing.
   - Handout the Disturbance Key Concepts paraphrasing form found at the end of this lesson.
   - Provide a whole-class demonstration on the board, taking one key concept on the importance of disturbance and showing how you could rewrite in your own words (examples are provided in a “teacher” form at the end of the lesson.)

---

**Paraphrasing**

Paraphrasing is rewriting ideas from a source in your own words while retaining the original meaning. It is often done to clarify meaning for the reader and supports the writer in understanding content as well. It is required, along with citation of sources, to avoid plagiarism. Paraphrasing is a skill that requires much practice and direct instruction. Whenever you assign a report, provide a mini-lesson or demonstration on paraphrasing using a related example text.
• Have students, in pairs, come up with paraphrased versions of the remaining concepts.
• Have each pair partner with another pair and compare statements.
• Ask them:
  • Do the statements you wrote mean exactly the same thing as the original statement?
  • Which is easier to understand? Your version or the original? Why?
  • Which paraphrased statement held the meaning, but changed the words the most?
• Show some of the best student examples, where meaning was retained but the words differed dramatically, on the board.
• Discuss students’ ideas about why some of their paraphrased statements are easier to understand than the original. Why might that be? What does that tell us about reading difficult or technical material?

16. Allow time throughout the week in class or the library to conduct research.
17. Shake it up and break it up! Students find reports and larger writing tasks to be daunting. Teach them strategies to divide and conquer the task. Try this “Fire Alarm!” strategy:
  • Over the five-to-ten school days after the assignment has been given, set a classroom alarm clock (your computer will work for this) for a random time each day. Be mindful of the times so you don’t interrupt a key point in your teaching!
  • Keep the times a secret as the element of surprise makes this strategy effective.
  • Teach students in advance the following protocol for the “Fire Alarm!” strategy.
    • When the alarm goes off, tell students to Stop! Drop Everything! Roll into Research Mode!
    • You must work silently!
    • You have five minutes with only the resources available in class to find one key fact about your selected plant or animal.
    • Once you find a fact, determine which of your guiding questions that fact answers.
    • Paraphrase or quote the fact in your notes associated with that part of your report.
    • Note the source of this fact in your works cited list (author, source title, source type, copyright date, page #, etc.)
  • Return to your seat before the timer goes off!
18. Post these rules for the “Fire Alarm!” strategy in your classroom for future reference.
19. Try to do this at random times daily for about five days. If you notice students are all on task and on a roll with their reports, find ways to extend or stretch the time at least until they finish the task at hand.
20. Adjust the timer to accommodate your students. Your goal is excitement and purposeful urgency, not panic or chaos.
21. Once they have conducted enough research to finish their reports, provide a mini-lesson with the Student Assignment Sheet and the Rubric so students know exactly what their finished report should look like.
22. If some of your students tried the PowerPoint report writing strategy attached, this is the point where they edit the PowerPoint in outline view and then copy and paste into Word, following the procedures provided.
23. If students have been working from note cards or paper/pencil, this is the point where they organize these notes and begin writing (by hand or using word processor) the information into a seven-or-eight paragraph report.
24. Have them draft until all parts of the report are written in 1st draft form.
25. Have students find a partner and each take turns sharing and commenting on each other’s 1st draft report.
26. Coach students to use questions to help each other make the reports more complete and more easily understood.
27. Using the peer feedback, have students revise their reports—adding details, rearranging the order of parts, clarifying points and developing stronger paragraphs that stay logically on topic answering the guiding question.

28. Once revisions are done, have student spell check and carefully proofread.

29. Have them save and then print a proofread draft.

30. Exchange drafts with partner.

31. Each partner reads and comments on the report in the role of editor, looking for grammar and spelling errors, as well as clarity of thought and completeness.

32. Return to author for final proofing, minor revision and formatting.

33. Self-assess and reflect using the rubric provided, and make any additional changes warranted.

34. Save.

35. Print final drafts.

36. Post or publish final drafts (can use bulletin boards, author’s chair, classroom websites, blogs, wiki’s, moodles, etc.)

37. Submit to teacher for feedback.

Assessment

- Direct observation of independent work (time on task, problem solving)
- Three sources from a variety of media found on students’ “Works Cited” list
- Notes in field notebook, note cards or PowerPoint (PP) draft
- Final Report: Self- and Teacher-Assessment Rubric
- Publication of report (share with class via author’s chair, bulletin board, websites, blogs, wiki’s, moodles, or PP)

Extensions

As suggested throughout the lesson, this standard report can be enhanced and shared with peers using technology. Support students in posting their report and possible PP presentation to a classroom website, blog, wiki, or moodle. Once posted, have each student write two questions that can be answered if you read their report. Have them all share these questions with each other (Google Forms is an option) and create a web-quest type of treasure hunt for the class. Invite students to access and read each others’ reports in order to answer the questions. In this way, they benefit from publishing their work for a real audience, and the class learns about all the plants and animals assigned and how they survive and thrive in a fire-dependent landscape.

Adaptations

The following adaptations are designed to support your efforts to meet the needs of every learner. Grade levels here are only a suggestion and would not preclude use of a great 3rd grade strategy with a 9th grader or vice versa.

Grades 2-3 (or students at any level who need more support)

1. Write a simple report following this lesson on an animal impacted by fire, but do so as a group, teaching mini-lessons on paraphrasing (with simpler text examples), on note-taking, citations, and report structure.

2. Use the PowerPoint strategy for your whole-group report demonstration, and fill slide by slide with students conducting the research and adding facts and details as they find them. This format makes it easy for students to see and follow your demonstration if projected using an electronic white board or other projection device.

3. If demonstrating using the PowerPoint strategy, create a mini lesson on organization by setting up the slides as a template (8 or 9) and then in slide sorter view, drag them into a scrambled order. Have students put them into logical order that follows report form and flows logically based on the topic. They will like dropping and dragging the slides into sequence and learn a lot about organization at the same time.
4. Each time a student (pair of students or group of students) locates a new fact, go through the entire process of noting the fact and also noting the source both with the fact and on the “Works Cited” page. Teach them where to locate the information.

5. Provide lessons early and often about plagiarism and how to avoid it by properly crediting sources.

6. Repeat different elements of note-taking and report development with students often.

7. Have students write in relation to content-area study daily using a variety of short summary, clarification, or reflection strategies (admit and exit tickets for example.)

8. Reports can be presented to others as PowerPoints, poster sessions, hosted or guided gallery walks, etc. Allow students to share their findings in a variety of ways based on interest and ability.

**Grades 9-12 (or students at any level who require greater challenge)**

1. There is great diversity in any high school class. As a result, some students will need extensive guidance and support that gradually diminishes over time. Others will need much more freedom and require a more open-ended process. Accommodate all by providing differing levels of support based on students’ needs.

2. High school students will like posting their reports to classroom blogs, websites, wiki’s or moodles. If they do so, require Internet-based discussion of student work using discussion boards or synchronous chat tools.

3. A common reason students’ leave college without a degree is weak writing skills. Students must write daily in a variety of modes with high expectations and equally high scaffolds or supports. The guidance provided in this lesson supporting use of PowerPoint, the Student Assignment Sheet, and the Assessment Rubric are designed to clarify this assignment with students at any grade level who may have had limited writing experience.

**References**


Student Assignment Sheet

You are assigned to independently write a report on a plant or animal that lives in our area and is impacted by fire. Find your plant or animal on the Fire on the Land DVD under Fire Ecology>Fire Effects: Plants, or, Fire Effects: Animals.

Your report will have the following parts:

1. Title
2. Introduction
   a. What plant or animal are you reporting on?
   b. Why did you select it?
   c. Why is it important?
3. Guiding Question #1
   a. Fact or detail
      i. Source
   b. Fact or detail
      i. Source
   c. Fact or detail
      i. Source
4. Guiding Question #2
   a. Fact or detail
      i. Source
   b. Fact or detail
      i. Source
   c. Fact or detail
      i. Source
5. Guiding Question #3
   a. Fact or detail
      i. Source
   b. Fact or detail
      i. Source
   c. Fact or detail
      i. Source
6. Guiding Question #4
   a. Fact or detail
      i. Source
   b. Fact or detail
      i. Source
   c. Fact or detail
      i. Source
7. Conclusion
   a. In summary, what have you learned about __________?
   b. What does it mean?
   c. Why is it important?

8. Works Cited
   a. Author, copyright date, title, source, where published, publisher
   b. Author, copyright date, title, source, where published, publisher
   c. Author, copyright date, title, source, where published, publisher
   d. Author, copyright date, title, source, where published, publisher

You will be evaluated on the completeness of your report (each section above is included), the quality of the information you uncovered, as well as how you presented this information and credited your sources. See the rubric below for guidance.

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>4</th>
<th>3</th>
<th>2</th>
<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization</td>
<td>Information is very organized with well-constructed paragraphs and subheadings.</td>
<td>Information is organized with well-constructed paragraphs.</td>
<td>Information is organized, but paragraphs are not well-constructed.</td>
<td>The information appears to be disorganized.</td>
</tr>
<tr>
<td>Information</td>
<td>All guiding questions answered with at least 2 sentences about each.</td>
<td>Most questions answered with at least 2 sentences about each.</td>
<td>Most questions answered with 1 sentence about each.</td>
<td>One or more questions were not addressed.</td>
</tr>
<tr>
<td>Sources</td>
<td>All sources (information and graphics) are accurately documented in the desired format.</td>
<td>All sources (information and graphics) are accurately documented, but a few are not in the desired format.</td>
<td>All sources (information and graphics) are accurately documented, but many are not in the desired format.</td>
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</tr>
<tr>
<td>Paragraphs</td>
<td>All paragraphs include introductory sentence, explanations or details, and concluding sentence.</td>
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<td>Paragraphs included related information but were typically not constructed well.</td>
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</tr>
<tr>
<td>Mechanics</td>
<td>No grammatical, spelling or punctuation errors.</td>
<td>Almost no grammatical, spelling or punctuation errors.</td>
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<tr>
<td>Disturbance Key Concepts – Take Away</td>
<td>In my own words...paraphrase.</td>
<td></td>
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<td>“Ecosystems constantly change in ways that are only partially predictable.”</td>
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<td>“The positive effects of disturbance on biodiversity are now well recognized by land managers, but not necessarily by the public.”</td>
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<td>“Natural disturbances including lightning-caused fires, floods, erosion, drought, disease, and insects, have been perceived to be in conflict with human economic interests. Efforts to suppress natural disturbances have resulted in reduced biodiversity and ecosystem health.”</td>
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<td>“The more we attempt to maintain an ecosystem in a static condition, the less likely we are to achieve what we intend. We must be willing to bear both the economic and biologic consequences of such management.”</td>
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<tr>
<td>Disturbance Key Concepts – Take Away (Quotes)</td>
<td>In my own words...paraphrase. (Cited)</td>
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<td></td>
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<tr>
<td>“Ecosystems constantly change in ways that are only partially predictable.”</td>
<td>Change is a constant state for ecosystems and the results of change can’t always be predicted.  <em>(Fire on the Land DVD)</em></td>
<td></td>
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<tr>
<td>“Disturbances are common and important in virtually all ecosystems.”</td>
<td>Ecosystems are dependent on disturbances, which occur regularly. <em>(Fire on the Land DVD)</em></td>
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<td>“The positive effects of disturbance on biodiversity are now well recognized by land managers, but not necessarily by the public.”</td>
<td>Scientists and foresters have known for a long time that disturbance has a positive effect on biodiversity, but in the general public, this is not common knowledge. <em>(Fire on the Land DVD)</em></td>
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<td>“Natural disturbances including lightning-caused fires, floods, erosion, drought, disease, and insects, have been perceived to be in conflict with human economic interests. Efforts to suppress natural disturbances have resulted in reduced biodiversity and ecosystem health.”</td>
<td>When we try to stop natural disturbances out of fear of personal loss, the biodiversity and health of our forests decreases. <em>(Fire on the Land DVD)</em></td>
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<td>“The more we attempt to maintain an ecosystem in a static condition, the less likely we are to achieve what we intend. We must be willing to bear both the economic and biologic consequences of such management.”</td>
<td>Trying to keep things the same and prevent change from occurring actually reduces the likelihood of creating stable ecosystems that are healthy and evolving naturally. Short-term pain, or economic loss, may be required to prevent long-term negative consequences to the land. <em>(Fire on the Land DVD)</em></td>
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# Assessment Rubric

Name: __________________________________________________________  Date: ___________________

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Scaffold for Report Writing Using PowerPoint

Student Instructions - Check as you go!

☐ Open a blank PowerPoint presentation file.
☐ Insert 7 or 9 slides, or one for each section of your report including an introduction and conclusion, as well as a references or works cited page and the default title slide. Make sure each inserted slide uses the bulleted list format.
☐ Write a title for your paper on the title slide that includes the name of your selected plant or animal, as well as your name as author of the report.
☐ On each slide, write the section heading or guiding question in the title box.
☐ Now, as you research your topic, take notes in this PowerPoint presentation, writing a single word or phrase on the appropriate slide for each detail or fact you find. Each note will be a “bullet” on the list.
☐ Note the author’s last name, if known, or title of the text or website (if author not known) next to each detail you add to any slide in the body of your report. This will make it easy to cite your sources later.
☐ Keep a list of the different sources you use, on the references or works-cited slide, write the author, title, magazine, website (etc.,) page number, publisher and copyright year.
☐ When you are done with your research and have collected notes on each slide answering each guiding question, convert your notes (which are now single words or phrases) into complete sentences. Each sentence will be a “bullet” on the list.
☐ Be sure to write these as complete sentences with a subject and predicate!
☐ There should be at least three detail sentences in your paragraph, but you could have a few more.
☐ You may want to add a closing sentence or summarizing sentence as the last “bullet” on each slide, or later develop a transition sentence.
☐ Run the presentation to check for organization. It should flow logically and will be something like this:
  • Title Slide
  • Introduction
  • Question or Big Idea #1
  • Question or Big Idea #2
  • Question or Big Idea #3
  • Question or Big Idea #4
  • Conclusion
  • Works Cited
☐ Reorder your slides using (slide sorter), or your bullets (select, drop and drag) within any slide to follow a logical pattern. This is revision in the writing process.
☐ Next, from “normal view” which allows you to see not only the slide in the editor, but also the 7-9 slides you have created along the left side of the screen, convert from showing the slides to the “outline” view on the left side.
While in outline view, you can correct spelling in the presentation using spell check.

Re-read the text for strong and specific word choice.

Re-read the text to be sure sentences are complete (no fragments, no run-ons.)

If you have a personal editing list or have a standard editing checklist, use it to be sure you have applied what you know about the rules of grammar and spelling.

Print your presentation as a six-slide-per-page, black-and-white handout for future reference.

Save your PowerPoint.

Finally, using the outliner view, select the text from all slides and copy.

In a new window, open a Word document and paste the entire PowerPoint (PP) text into Word.

Save the Word file with your report short title and your last name.

The Word document will carry with it the formatting from the presentation including bullets and hard returns. It will be messy. To get rid of bullet and font formats, you want to “clear formats.”

- In Word 2007, from the Home tab, go to the “Styles” corner drop down arrow (located in the upper right hand corner.) With the text of the document selected, select “Clear All” from the style options or “Clear Formatting” from the Styles drop down arrow. This will get rid of fonts, bullets, bolding, etc., leaving only the text.

- In Word 2003, go to Edit>Clear>Formats. Again, this function will remove all formatting.

Format a title page or title heading with your report title, your name as author, and the date of the report, centered, in larger font and bold at the top of the first page of your report.

Use your printed PP handouts to determine where each section of your reports starts.

Use your guiding questions as headings for the sections in the body of your report and format them in bold text.

Label the Introduction, Conclusion and Works-Cited sections will be labeled with those words.

Below each guiding question write a paragraph with several sentences that answer the question.

Indent the first sentence of each paragraph.

Remove any “hard returns” so the text wraps and looks like standard prose.

Now, re-read, conducting your final proofreading for completeness and correct any spelling or grammar errors.

Read aloud to check transitions and correct if necessary.

Examine the layout of your report and prepare the paper for final printing.

You may want to print a draft and submit for editing support (either peer editors or teacher editing).

Don’t forget to save your file!

Print and share.
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### 7. How is [plant or animal name] impacted by fire?

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### 8. Conclusion

- In summary, what have you learned?
- What does it mean?
- Why is it important?

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### 9. Works Cited

- Author, copyright date, title, source, where published, publisher
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“All fires need three things to burn: heat, fuel, and oxygen. These three elements make up the fire triangle. Remove any one of them, and the fire will not burn. Managing fuels is the wildland fire manager's primary tool.”

— Fire on the Land DVD
Recipe for Fire

Cultural Value: Responsibility, Self-restraint, Fortitude, Skill, Relatedness, Balance, Cooperation, Observation, Respect

Rationale
For the elders, the knowledge regarding the use of fire and the ingredients that create and sustain fire are common sense. It was knowledge they always held and passed down through stories and by demonstrating the use of fire to each subsequent generation. When fire scientists talk about fire, they use models and the language of fire science. Today, we use fire science informed by the knowledge of our elders as we manage forests so they support abundant plant and animal life. In this lesson, students will explore the fire triangle—the ingredients required for fire.

Learning Targets
- I behave responsibly and safely.
- I follow directions with care, listening attentively.
- I demonstrate respect for fire through my safe behavior.
- I write directions that are clear, detailed and specific, and can be followed.
- I know the ingredients required for fire.
- I can set up an experiment to test my hypothesis or prediction.
- I watch closely, collecting accurate data.
- I work cooperatively as a member of a group.
- I observe how changes to any of the three requirements for fire alters fire behavior.

Resources
Fire on the Land DVD (Disk 1) or you can use the Curriculum DVD (this DVD), which contains the full contents of Disk 1.
Computer with DVD player
PC projector
Large piece of chart paper for each group
Markers for each group
Field notebooks or notebook paper and pens
Newspaper
Butane lighter(s) (long-handled)
Personal protective equipment (PPE) (Nomex/Kevlar shirts, goggles, gloves borrowed from local wildland fire crew cache)
Fire extinguisher
Spray bottles
Hose and buckets filled with water (one bucket per group for safety)
Sidewalk chalk (optional, used to maintain distance from experimental fires)
“Fire Triangle” article handouts
“Sxʷpaám: The One Who Makes Fire” article handouts
Highlighting markers, one per student
Data-capture forms (print front and back with predictions and observations, one per student or group)
Clipboards (handy, but optional)
Stopwatches or watches with second hand
Outdoor location with gravel, concrete or blacktop surface, far from flammable materials
Calm wind and low fire-danger conditions

**Instructional Techniques**
Activate background knowledge using individual writing activity, small-group process, inquiry, and scientific experimentation, observation, whole-group debrief.

**Time Frame**
This lesson takes at least four 50-minute class periods depending on whether students conduct a single observation for their group or multiple observations of each group’s experiment. A block period or extended time is advisable on day two to ensure the experiment is conducted completely and safely.

1st period write instructions on how to build and put out a campfire, make predictions regarding fire behavior based on manipulation of variables of the fire triangle, role assignment, and briefing

2nd and 3rd periods conduct experiment, record data, begin data analysis, after-action analysis

4th period (as needed) review fire triangle, complete analysis of data with inferences from “Fire Triangle” article, report and write up findings, debrief, examine regimes, revise fire-building instructions based on what they learned

**Suggested Grade Levels**
**Grades 3-12**
Procedures below target students in grades 5-8. However, with suggested adaptations following the procedures section, these may be useful for grades from 3 to 12.

**Procedures**
**Day One (or 1st period)**
1. Have students get out field notebooks or paper and pen.
2. Ask students:
   • How many of you have built a campfire?
   • Does anyone in class heat their home with wood?
3. Have students share their experiences with a neighbor.
4. After the oral rehearsal, assign students to complete the following writing assignment independently:
   “Imagine you have made a new friend who has never built a campfire. Your friend could be from a large city or another country. Your friend is camping next weekend with her host family and is worried about not knowing how to help in camp. She has asked you for instructions. In a note to your friend, provide detailed directions for how to build and extinguish a campfire. Be sure to make your instructions specific enough so your new friend will be able to follow the directions and successfully make and safely put out a campfire. Her family leaves in less than an hour, so you have just 10 minutes to provide instructions. Remember to emphasize safety at each step.”
5. Place a ten-minute timer on the board and have students individually write a detailed list of instructions for their friend.
6. When time is up, conduct a brief whole class discussion, making a list of instructions on the board as you go, with input from the class.
   (Don’t forget to emphasize safety, location of the fire, fire ring, clearance of dry or combustible materials etc., as many of your students will have omitted these steps. Also emphasize ways to assure the fire is dead out prior to striking camp.)
7. Collect their lists, or have them leave their notebooks open on their desks to the list during recess or lunch time so you can determine prior knowledge of the ingredients for building and putting out a campfire.
8. Tell students you will be conducting an experiment regarding ingredients required to “make” fire. Close attention to safety rules and following directions explicitly is required.
9. Seat students in small groups of four or five.
10. Provide each group with four half sheets of newspaper. Each half sheet should be the same size.
11. Have students, in their groups, fold or crumple each sheet of newspaper into a different form, from loosely crumpled or folded, to tightly crumpled, rolled, or folded. Their goal is to make each of the four sheets of paper as different from the others in compactness or density as possible.
12. You may select to demonstrate by loosely crumpling, or tightly crumpling, or even tightly rolling and twisting sample sheets of paper.
13. Once they are done, ask them:
   • How do you think each of these pieces of paper in front of you will burn?

Steps 1-7 can be completed in the communication arts block prior to the actual experiment. It is possible to do steps 1-16 on the first day and to assign roles a day before the actual experiment. This allows students to think about their part in the experiment and reflect on what they will need to know and do.

Experiment Options
This experiment can be done several ways based on the students’ level of responsibility, your school’s safety procedures, and the level of adult supervision and support you have. Invite parent volunteers or other responsible adults to join you so you have an adult monitoring each group. Based on your students, you may opt to conduct one experiment with the teacher doing the fire lighting and each team of students conducting the observations from a single fire. (Draw a chalk circle large enough for the entire class to stand outside it and each student can see.) Video prepared by the teacher can be substituted for live demonstration, but diminishes students’ motivation, curiosity, and sense of wonder during this investigation.
• What do you predict?
• They all are the same in quantity (weight) but differ only in form. Will there be any differences?

14. Using the “I predict…” or “Hypothesis” form printed on the back of the data-capture form, have students generate a list of predictions they make as a group regarding possible similarities and differences in how each piece of paper will burn.
• What do they think will happen?
• Why?

15. Next, have each group write a detailed description of each of the four different newspaper configurations. They will record this on the data-capture form under “characteristics.” If you choose to, you may ask them to individually write a short (two- to three-sentence) descriptive paragraph in their field notebooks for each of the four pieces of newspaper, and then share as a group, come to consensus, and then collectively write it on the data-capture form. In addition to the written description, students could draw the newspaper in the space provided or their notebooks or take a digital picture to capture it.

16. Using a sensitive scale, have students weigh each and record the pre-combustion weight under characteristics. This weight will be compared later to the “post-burn” weight for any samples that were not fully consumed after four one- to four-second attempts at ignition.

17. In preparation for role assignments, take a few minutes to read about traditional roles connected to fire based on the testimony of the elders.

18. Pass out single page article: “Sxʷpaám: The One Who Makes Fire” or project this section from the Fire on the Land DVD found under the History>Traditional Culture tab. Allow five minutes to read before assigning roles.

19. Assign roles:
• Safety Officer (Sxʷpaám) — assures that members of the team stay several feet away from the experimental fires, draws containment circle with chalk (approximately a five-foot circle with an “X” in the center), operates a spray bottle of water to extinguish experimental fires in the event that this is needed, and reads or reminds team of safety procedures including maintaining distance from the fires, checks that hair is pulled back and protective personal equipment (PPE) or fire resistant clothing is worn, etc.
• Fire Lighter (Sxʷpaám) — lights the fires, one observation at a time, under the strict supervision of the teacher, adult volunteer and Safety Officer. Counts seconds of application of flame (heat) to paper (fuel) to support the observations of the Ignition Monitor. Up to four one- to four-second ignitions could be applied. Repeated applications only occur when the fire fails to sustain itself and burn the paper.
• Ignition Monitor — counts the number of times flame must be applied to each newspaper configuration to ignite, as well as the duration in seconds of this application of flame (heat).
• Duration Monitor — counts how many seconds (or minutes) the ignited paper burns until it is fully consumed or burns out.
• Intensity Monitor — estimates the flame height in centimeters by lying on the ground parallel to the experimental fire using a metal ruler. This will be estimated from about 4 feet away.

20. Once assignments are made, have students shift seating to sit with others assigned to the same role.

21. Provide instructions for each student group based on their role, and assign them measurement or safety tools required along with clipboards for their data-collection forms to capture their observations.

22. Move from group to group, providing instructions starting with the Safety Officers, who will have additional responsibility to brief their groups. Provide Safety Officers with your list of safety rules and specifications. Here are some ideas:
• Follow all directions of the teacher.
• Avoid talk unrelated to the experiment to assure everyone can hear instructions and do not talk while directions are being provided by either the teacher or the group Safety Officer.
• Do not enter the containment circle without permission from the Safety Officer.
• Do not enter the containment circle unless you have a role that requires it.
• Always keep your eyes on the experiment and watch for hot ash or sparks.
• Douse any ash or sparks in the event of a breeze using hose, bucket, or spray bottles.
• Have safety equipment stationed with each group.
• Remember that this experiment is to be conducted at school only. You must never try this at home. **You must never play with matches or disrespect fire.**

23. While you are briefing the other groups, the Safety Officers must review the rules and prepare a “pre-experiment” safety briefing for their group to be provided with the support of a firefighting professional on the day of the experiment.

**Day Two (or 2nd and 3rd periods)**

24. Have students sit in their groups.
25. Invite the Safety Officers to provide a briefing for their group.
27. Introduce the guest speaker who will extend the conversation—providing a talk on safety, PPE, and the responsibility to the group. This individual will assist in monitoring safety during the experiment.
28. After a complete review of roles and safety procedures, tell students you will be going outside to conduct an experiment to see which of their predictions from the previous day turn out to be true.
29. Prepare them with the resources required including hoses, buckets of water, PPE, and the data-collection tools required.
30. Go to the site of the experiment.
31. Have Safety Officers mark off an area for each group.
32. Instruct Fire Starter to take the first piece of newspaper into the containment circle and place it in the center. (If there is a light breeze, you may instruct the students to use a small rock to keep the loosely crumpled or lightly folded examples from blowing away.)
33. Remind students they will get only one try at capturing the data, and some examples will go by very quickly.
34. Have the Fire Starter light the first demonstration fire, using just one second to attempt to establish ignition. If this fails, a second attempt for two seconds, then a third for three seconds and finally a fourth ignition may be attempted, holding flame to the paper for four seconds. The Ignition Monitor records each attempt. The Duration Monitor determines how long the paper burns. The Intensity Monitor looks at flame height. If the paper is not fully consumed after 4 attempts, save the remnant to be weighed “post-burn.”
35. Repeat these procedures for each of the 4 observations.
36. Ensure all fire is out. (Don’t soak paper unless necessary, as it will destroy fuel weight data.)
37. Clean area.
38. Return with data to the classroom.
39. While the professional firefighter is still present, take time to conduct a whole-class after-action analysis following the model of professional firefighters and emergency response personnel.
40. Ask the following questions and record the firefighter’s and students’ responses on the board:
   • What was planned?
   • What really happened?
   • Why did it happen?
   • What can we do better next time?
41. Thank your guest for his/her time and support, and continue the experimental procedures.
42. Measure any remnants of paper and record.
43. Finish individual or group data forms, sharing, and adding information from each observer in the group so each form is complete.
44. Examine data and discuss what they observed.
   - What happened to each paper?
   - Were there differences?
   - What differences are noted from their predictions and their direct observations?
   - Why do they think these differences occurred?
45. After allowing time to examine the data and discuss observations, have students write what they observed in the observation column of the prediction or hypothesis form.

**Day Four (or 4th period)**
46. Continue sitting in experiment groups.
47. Pass out Fire Triangle handout, one per student, along with highlighters.
48. Tell students they are going to read more about the requirements for fire, to better understand the differences they observed in yesterday’s experiment.
49. Have students individually read the two-page hand out, and each time they come to a possible explanation for the difference between their observations, have them highlight it.
50. Allow five to ten minutes for the reading.
51. Have groups discuss their hunches as to the causes or potential causes of the differences in behavior.
   - What elements of the fire triangle were being altered?
   - How did fire intensity, duration, and fuel consumption change?
   - Why? What can they infer from the data and observation?
52. Invite them to record their findings in their field notebooks—or as a group on chart paper to share and discuss with the other groups in the class.
53. Debrief with the entire class, using the *Fire on the Land* DVD. Click the button at right and navigate to Fire Ecology>Fire Concepts>The Fire Triangle.
54. Extend the lesson by showing and discussing Fire Regimes located under the Fire Ecology tab. Ask students:
   - What conditions create lethal fires based on what they now understand about the fire triangle?
   - What conditions create non-lethal fires based on what they now understand about the fire triangle?
   - Discuss high frequency/low intensity vs. low frequency/high intensity patterns.
   - Which regime dominated the landscape resulting from fire being used by the Tribes 200 years ago?
   - Which regime dominates the landscape now? Why?

See the animation on the facing page for the answers to the last two questions or go to Fire Ecology>Fire Regimes>Changes on the Fire on the Land DVD (Disk 1).
55. Leave them to ponder... How do we fix this? What can be done?
56. Assign them to revise their fire-starting and extinguishing instructions for their imagined friend, taking into account what they have learned.

**Assessment**
- Pre- and post-fire building and extinguishing instructions
- Data collected on form
Fire Regimes

The term fire regime refers to the kind of fire that typically occurs in an area and the effects that a particular type of burning has on the vegetation. Fire regimes are described by fire frequency (how often fires occur), fire intensity (whether the fires that burn are mostly surface fires that burn ground vegetation or crown fires that burn on the ground and consume vegetation in the canopy), and the pattern of vegetation that the fires create. Scientists generally recognize four fire regimes in western Montana: Nonlethal, Mid-Elevation Mixed, Lethal, High-Elevation Mixed (although their names can vary from region to region). Use the buttons below to explore each fire regime.

- Predictions and observations form, or hypothesis and findings form
- Highlighting on Fire Triangle information sheet showing inference of cause/effect on demonstration fires
- Findings summarized in field notebooks or group-process charts
- Observation of cooperation
- Observation of respect for the power of fire, indicated by safe execution of experimental fires and recorded in the whole-group after-action analysis

Extensions

At the close of this investigation, invite a guest speaker who is highly experienced in using traditional methods for starting fires. Ask your guest to conduct a demonstration so students will see the relationship of fuel, oxygen, and heat to the ignition and sustaining of fire. This demonstration would be outstanding at any grade level. Contact the CSKT Natural Resource Department or the Tribal Education Department for referrals of quality guest speakers who possess this skill and have firsthand knowledge of the application of traditional fire-starting techniques. Demonstrate the drill method, plow method, and use of flint.

Adaptations

The following adaptations support your efforts to meet the needs of every learner. Grade levels here are only a suggestion and would not preclude use of a great 3rd grade strategy with a 9th grader or vice versa.

Grades 2-4 (or students at any level who need more support)

1. All fire lighting can be done by the teacher and may be videotaped and played back, requiring students to make observations.
2. Preview information on the DVD with students regarding the fire triangle.

3. Other ways of addressing the concept of the fire triangle written at various grade levels can be found in the Fire Works Curriculum. Go to http://www.fs.fed.us/rm/pubs/rmrs_gtr65.html to download.

**Grades 7-12 (or students at any level who require greater challenge)**

More advanced students should be given more responsibility and conduct the experiment with greater independence and manipulate more variables. Following are some ideas to differentiate this inquiry for more advanced students.

1. Allow teams to conduct and control the experiment with greater independence under supervision and with strict role assignment.
2. Create an option for some to work independently under your supervision.
3. Use a spray bottle on “fine mist” setting, and conduct the experiment again, or add an observation, introducing moisture to the fuels. How much heat is required to cause ignition of moist fuel?
4. Require students to write their “predictions” in the form of a formal hypothesis and to use their field notebooks to record all the steps of the experimental process they use to test the hypothesis. Provide support from your adopted science curriculum on scientific method.
   - A hypothesis is a prediction based on a hunch or educated guess about how things work.
   - A hypothesis can be written like this: “If _____[I do this]_____ then _____[this]_____ will happen.” For example: “If I roll the newspaper tightly, then it will burn more slowly than newspaper loosely crumpled.”
   - A hypothesis can be tested by designing an experiment. To do this, there need to be measures or observations of what you do (treatment or independent variable) and what happens or appears to happen as a result (dependent variable).
5. Have all teams conduct measurements on their own and each other’s test fires. Have them examine differences and similarities in configurations of newspaper, categorize the configurations, and then average the data by category, looking for outliers, etc.
6. Invite students to take digital photographs of the “pre-burn” configurations to document them.
7. Invite students to make a short video documenting the experiment. This will allow them to conduct observations under more controlled conditions after the test fires.
8. Older students can record their careful conducting of this experiment and share their videos with younger students, who can conduct the measurements from the recorded test fires.
9. Extend the math lessons built into this lesson by requiring manipulation of the data (measures of central tendency, etc.) and representation of the data (graphs and charts to help with analysis.)
10. Use Excel or other spreadsheet software to capture and represent the data.
11. Extend discussion of the chemical reaction for combustion represented by the fire triangle (fuel + oxygen + heat = carbon dioxide + water vapor + heat + light).
12. Challenge each group to use what they have learned about fuel, oxygen, and heat to come up with a configuration for a single ½ sheet of newspaper that will ignite with a single one-second flame and burn continuously for as long as possible. Each group can then repeat the experiment to see which configuration burns longest.

**References**


9.11 Recipe for Fire

**Sxʷpaám – The One Who Makes Fire**

Across a territory of tens of millions of acres, and throughout a land tenure of many thousands of years, Salish and Pend d’Oreille people used fire to shape and care for their homeland. This was land management on a vast scale. Tribal people applied fire in various years, and at various times of year, and for various reasons, across the full range of the ecosystems of the Plateau, Northern Rockies, and high plains.

We’ve been told about the traditional use of fire over many years by tribal elders. They have explained how the use of fire was a difficult, complicated, and dangerous task, one only learned through long experience. The elders have talked about the role in the Tribe of the Sxʷpaám, the one who makes fire, and that he was a person of high knowledge and training. “They have certain guys that take care of that,” Salish elder Eneas Vanderburg said. “They know what to do... they have special guys [and] that’s their duty. They’re appointed to take care of the fire.” Eneas recalled that “my grandfather used to say they carried their ashes [and hot coals] in a kind of a container....they’d take good care of the fire... So they kept that on a separate...horse.”

Among the Kootenai people of British Columbia, elders said that the same kind of care was taken, with coals placed within ashes and carried on sticks for short journeys, or “placed within the halves of a clam” for longer trips. There were also ways of restarting fire when necessary, using drills or flint, but when possible, the Sxʷpaám and people in camp tended the fire and kept it alive.

Among the Kootenai, the fire-keeper maintained two special bags — one to keep tinder from a tree fungus that could easily ignite a spark from a drill, and the other for a certain kind of dead wood that could then receive the glowing fungus.

The Sxʷpaám was as careful in using fire on the land as he was in keeping the ember burning in traveling between camps. “They didn’t burn things just indiscriminately,” Salish elder Louie Adams pointed out. The elders have given a clear understanding that the people carefully “used the fire like a tool,” as Pend d’Oreille elder Mike Durglo Sr. put it.

Of course, accidents sometimes happened; sometimes there were uncontrolled, destructive fires long ago, just as there are today, and sometimes those fires were the result of human error, just as they are today. But that was not the norm. As with so many other aspects of the traditional way of life, the use of fire was in part based on careful, quiet, long observation of the natural world, on discerning what was of benefit, and what was harmful. “My grandparents and other old people have said you [must] pay attention,” says Tony Incashola, Director of the Salish-Pend d’Oreille Culture Committee.

> “Pay attention to the animals, pay attention to the plants, pay attention to these things and you’ll know what the needs are. You watch an animal...and...you see how it lives; you see what the needs are and then you see how nature takes care of it. Once you learn that, then the Indian people copy that, they do that. And then they learn that and then they pass it on.”

Some of the deeper specific knowledge of how fire was used may have been lost in the traumatic disruptions of tribal culture and oral traditions over the past three centuries. But the elders remember enough to help us understand the basic relationship with fire, and the function that it served within the traditional way of life.
Fire Triangle

Typical interagency fire behavior courses teach two different fire triangles concepts. This lesson plan teaches the basic “fire triangle”, which includes heat, oxygen, and fuel. The more advanced “fire behavior triangle” includes fuels, weather, and topography and is taught as a concept in more advanced fire interpretation and prediction fire courses.

Heat

Heat can refer to several aspects of wildland fire.

A heat source is responsible for the initial start of a wildland fire, and heat is also needed to maintain the fire and permit it to spread. In addition, heat is constantly being released from the fire, warming the surrounding air and preheating fuel in its path.

Heat transfer is a critical issue in the study of wildland fire. For a fire to grow and spread, heat must be transferred to the initial and surrounding fuel. Heat allows fire to spread by removing (evaporating) the moisture from the nearby fuel, enabling it to travel more easily. The mechanism and the speed of heat transfer play a great role in wildland fire behavior.

Three mechanisms of heat transfer exist: convection, radiation, and conduction. All three contribute in different ways to the combustion process, depending in part on the available fuel distribution, the wind speed at the fire site, and the slope of the terrain.

Convection is the transfer of heat through the flow of liquids or gases, such as when hot air rises through a chimney. Convection currents are often responsible for preheating higher shrub layers and the canopy, carrying the ground fire upwards.

Radiation transmits heat by rays, such as from the sun or a flame. Radiation accounts for most of the preheating of fuels surrounding a fire. The temperature of these fuels can sometimes grow so high that the fuels ignite prior to contact with flames, spreading the fire.

Conduction moves heat from one fuel particle to the next, as when the stove burner heats a pan and its contents. Conduction allows the heat to be transferred inside and throughout the fuel, rather than only heating the surface. Because wood is a poor heat conductor, meaning heat does not pass through it easily, conduction is usually not the primary mechanism of heat transfer in a wildland fire.

Fuel

The fuel side of the fire triangle refers to both the external and internal properties of the fuel. External properties refer to the type and the characteristics of the fuel material. Internal properties of fuel address aspects of fuel chemistry. Types of fuel include living vegetation, dead vegetation, (duff, twigs, needles, standing dead snags, leaves, and moss), organic subsurface material (peat and coal), and human built structures. Fuel can be defined as any combustible material.

Fuel is characterized by its moisture content, size and shape, quantity, and the arrangement in which it is spread over the landscape. The moisture content of any fuel will determine how easily that fuel will burn. Live trees usually contain a great deal of moisture, dead logs very little. Before a wet fuel can burn, the moisture must be converted to vapor through the heat process. The greater the moisture content, the higher the heat temperatures
required to dry the fuel. The presence of moist fuel can affect the rate and direction that a wildland fire spreads. High moisture content slows the burning process because heat from the fire must first expel moisture.

The size and shape of fuel in part determines its moisture content. Lighter fuels such as grasses, leaves, and needles quickly expel moisture, and therefore burn rapidly. Heavier fuels, such as tree branches, logs, and trunks, take longer to warm and ignite. In areas of light fuel, the temperature required for ignition is lower than in areas of heavier fuel. The oxygen surrounds lighter fuels and allows the fuel to burn with greater intensity, quickly exhausting the fuel supply.

The quantity of combustible fuel in a given area is known as fuel loading. These fuels may be arranged in a uniform pattern and distributed continuously across the ground, allowing a wildland fire to travel uninterrupted. Or, the fuel may be distributed unevenly in a patchy network, forcing the fire to travel over rocks and other barriers by wind-borne embers.

The vertical arrangement of fuel is also an important factor in wildland fires. Ground fuels are all of the combustible materials found below the ground surface, and include tree roots, duff, and organic material. Surface fuels are found at the ground level, including twigs, grass, needles, wood, and other vegetation. Aerial fuels are standing vegetation including tree crowns, branches, leaves, snags, and hanging moss. Crown fires are able to burn independently of surface fires, moving through the treetops.

**Oxygen**

The third side of the fire triangle represents oxygen. Air contains about 21% oxygen; most fires require air with at least 16% oxygen content to burn under most conditions. Oxygen supports the chemical processes that occur during a wildland fire. When fuel burns, it reacts with oxygen from the surrounding air, releasing heat and generating combustion products, e.g., gases, smoke, particles. The process is known as oxidation.
<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Number of Ignitions</th>
<th>Duration of Ignition in Seconds</th>
<th>Duration of Burning in Seconds or Minutes</th>
<th>Fully Consumed or Partial (Pre and Post Fuel Weight)</th>
<th>Intensity of Burning (Estimated Flame Height in Centimeters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
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<td>2</td>
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<td>4</td>
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<tr>
<td>I predict that .......</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
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<td>------------------------</td>
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<tr>
<td>I observe that .........</td>
<td></td>
<td></td>
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<tr>
<td>Hypothesis</td>
<td>Finding</td>
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<td>------------</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| **1**  
“If _____[I do this] _____, then _____[this]_____ will happen.”  
“When _____[I did this] _____, then _____[this]_____ actually happened,  
________ {Proving..... or disproving}______ my hypothesis.”  
Why do you believe that happened?  
If you have a new hunch, or hypothesis, how can you prove or disprove it? |
| **2** | |
| **3** | |
| **4** | |
“Forest succession refers to change, specifically the patterns of change that occur in a forest over time. In the Northern Rockies, fire is the primary driver of change. One of the primary ecological concepts underlying this curriculum (a concept that tribal fire managers both past and present have always understood) is that change is a natural part of healthy forest communities.”

— Fire on the Land DVD
If This...Then What?

Cultural Value: Relatedness, Cooperation, Humor, Observation

Rationale
Our elders knew the effect of fire on the land and the animals and plants; they understood its effects on the varied resources they required to survive. Fire managers would say they understand the fire triangle and the nature of fire behavior. The Tribes burned for many reasons. The result of frequent, low-intensity fires included open stands of timber with a rich diversity of grasses, berries, and bushes, as well as abundant game. In this lesson, students will explore the nature of forest succession and learn to predict how different forest and grassland types respond to fire.

Learning Targets
- I know the stages of forest succession.
- I identify the forest succession stages in the local landscape and photographs.
- I understand how fire impacts the land differently based on the frequency of burning and the fuels on the land.
- I contribute as a member of a group.
- I solve problems using knowledge of forest succession and fire behavior.

Resources
Fire on the Land DVD (Disk 1) or you can use the Curriculum DVD (this DVD), which contains the full contents of Disk 1.
Computer with DVD player for whole-group presentation
PC projector or projector and electronic white board
Signs printed with succession descriptions (attached)
Photos of different succession stages printed, one per learner
Game cards with fire, water, fire suppressed, no fire, and the wild card of wind
Tape or tacks

Instructional Techniques
Direct instruction, small-group process, problem-solving game

Time Frame
One 50-minute class period devoted to learning the stages of forest succession, playing “If This ... Then What?” and debriefing

Suggested Grade Levels
Grades 4-12
Procedures below target students in grades 5-8. However, with suggested adaptations following the procedures section, these may be useful for grades from 3 to 12.
Procedures

1. In advance, print and cut out game pieces including deck of cards with fire, no-fire, water, suppressed fire, and wind; forest succession cycle descriptions (print whole page), and photos for matching activity (one per student). Be sure to divide the photos of each succession stage evenly based on the number of students in your class. These will be used for creating six groups (one group per stage) with roughly equal numbers of students in each group. So, if you have 24 students, you will print four images of “Grasses, Forbs and Shrubs,” four of “Seedlings and Saplings,” etc., until all six stages are equally represented and each student has a unique photo.

2. Begin by pre-teaching the succession stages to the entire group.

3. Pass out blank paper, one piece to each student (could be recycled office paper) and markers, colored pencils, etc. These will be used by students to create individual drawings (mind map) of the cycle of succession to promote long-term memory during the presentation.

4. Using the Fire on the Land DVD, pre-teach the stages of forest succession (click the button at right and go to Fire Ecology>Fire Concepts>Forest Succession).

5. Tell students up front that the class will be playing a game today, and all the information they need to be successful will be covered in the next 10 to 15 minutes. They will need to listen carefully.
6. Note that the information is presented in two ways. In order to pre-teach the stages and the concept of how fire as a disturbance changes the progression, you will want to use both the photos and the narrative, along with the succession animation.

7. Have students create their own quick drawing of the succession cycle on the paper provided. Check these by walking through the room to ensure understanding.

8. At the end of the presentation, conduct a quick, “What would happen if...fire, rain, etc.?” demonstration to support them in the next part of the lesson.

9. By way of review, have the class help you post the descriptions around the room in order of the succession cycle, using each wall and spreading them as far from each other as physically possible in your space.

10. Clear an area in the classroom to conduct the game.

11. Distribute photos, one per student with even numbers of images for each stage of succession (grasses and shrubs, saplings and seedlings, pole stage open, pole stage dense or closed, mature open and mature closed.)

12. Have students walk throughout the room reading each of the descriptions posted. Once they have read them all, have them stand by the definition they think describes their image.

13. As groups develop at the same description, have them check their knowledge by comparing their images. Can they see how each stage is actually a range and there can be significant variation in what the images show?

14. They may add their photos to the wall with the description to help other students understand the nature of a given stage. Observe as they do this, and you will quickly see who was able to retain this information from the introductory presentation.

15. As they conduct this cross-check, the teacher roves the room to support them, making sure all end up in the right location. Note that there is ambiguity in the photos, as some images of advanced saplings and seedlings look like immature closed pole stands, and open mature lodgepole could be considered Mature Open or Open Pole stage, as the species warrants. Like foresters, sometimes they must make an educated guess from within the limits of their data.

16. Once in groups they will stay together for the game, working and moving as a team.

17. Review the order of succession with the entire class. They should now be standing in groups, below their sign, in that order.

18. Next, introduce the cards. Tell them that each card has a condition on it (fire, no fire, water, suppressed fire, and the wild card, which is wind). These conditions can also be called independent variables. The stages in the succession cycle are dependent variables. Independent variables “act on” or change dependent variables. In the case of wild fire, there is a close relationship between these two types of variables.

19. Conduct a demonstration with the students.

20. Remind them that they, as a group, will be asked to “stand and deliver,” answering the following two questions:
   - If (condition such as fire) occurs in (succession stage), what will change over time?
   - Why?

21. Post the questions on the board.

22. For example: “If I am in the grasses and shrubs stage, and I draw the water card, indicating rain, moisture and no fire, what will happen over time if those same conditions continue and no fire is present?”

23. What do they think? Discuss. (Answer: Grass grows tall and thick, and over several seasons shrubs increase, and saplings and seedlings will begin to fill in open meadows or hillsides.)

24. If the mature open forest team draws the water card, indicating rain, moisture and no fire, what will that team become over time if no fire occurs? (Answer: It will over-grow, becoming mature closed with ladder fuels.)
25. The goal of each team is to accurately move to the next stage (or stay in place) in response to the condition they draw.

26. Here are the instructions:
   - Draw a card indicating rain, fire, fire suppressed, or no fire.
   - Allow students to talk as a group about what they think will happen over time resulting from that condition.
   - When the students have had adequate time, ask that all talking stop. Have teams move to the stage that will likely result from the condition.
   - Once at the new succession stage, each team will report out, stating:
     - If ____________, what will change over time? “If it rains, the grasses will grow and over time saplings and seedlings will encroach on open land.”
     - Why? “Rain promotes growth and without fire, young trees gradually take over.”
   - Each report should take just 1 minute at the beginning and later as little as 20 seconds.
   - Ask the class to confirm.
     - Are they right?
     - Any thoughts otherwise?
   - If a team moves to the wrong location, they will simply return to their previous stage and the process will begin again.
   - Continue around the room until all teams have reported.
   - Note that several groups could easily end up at the same location, and some may move, while others stay put depending on the response to fire.
   - In the deck there is also a “wild card” in the form of wind. If “wind” is drawn, then a second card will be drawn after it. Teams must determine how wind + (other condition) + (forest stage) = ________. (To extend the math concepts, use this equation to support them. You may want to post it on the board.) But this time, groups will have only 1 minute to discuss, then move and report—double time!

27. Play the game until students have cycled through all the cards once or students easily move from succession stage to succession stage—or stay in place—as the conditions dictate.

**Assessment**
- Individual quick sketches of succession stages.
- Placement of description cards in order of succession around the classroom.
- Accuracy of match between the photo and the description of the forest succession stage.
- Evidence of awareness of ambiguity in some photos – could argue either way as it is a range of growth patterns defined by the stage.
- Direct observation of accuracy of movement from stage to stage (or standing still) based on conditions presented.
- Accuracy of “stand and deliver” explanations.
- Observation of equity in group participation.

**Extensions**
1. Students would enjoy doing a PE version of this game outside or in a gym. Increase the distance between groups and have them run, skip, float, slither or spin to the next location. Play until they know all the stages of forest succession in response to the different conditions, and their heart rates are elevated!
2. You might want to adapt creative movement commands for the above game to include fire terms such as
running, creeping, crowning, spotting, flareup, and blowup. The Fire on the Land DVD includes a glossary (click the button at right and go to: Fire Ecology>Fire Concepts>Fire Terms) or try this web site for a more extensive list of fire terms http://www.wa-imt2.org/fire_terminology.htm.

3. Have students take photographs of examples in your area of the different stages of forest succession. Students can later tag the digital images with the succession stage label, sort, and import to create a slide show or PowerPoint (PP) photo album.

4. Mixed-up unlabeled PP slides provide a great opportunity to learn the stages and how to recognize them in our diverse landscape. With photos mixed up and presented in slide sorter view, have students individually or in groups organize by succession stage by dropping and dragging into place—including looking for evidence of transition in the images. Once in order, play the show for the class. Adding music is always an option here! Keep it fun.

Adaptations

The following adaptations are designed to support your efforts to meet the needs of every learner. Grade levels here are only a suggestion and would not preclude use of a great 3rd grade strategy with a 9th grader or vice versa.

**Grades 3-4 (or students at any level who need more support)**

1. Conduct a trial run with all students at one stage moving in response to cards drawn representing each condition. Practice until all feel confident.

**Grades 9-12 (or students at any level who require greater challenge)**

1. Consider having older students write their “stand and deliver” response. You can modify the assignment to make this writing a bit more comprehensive. They could do this quickly individually, then compare notes and “stand and deliver.” This is a good application of writing to learn.

References

10.9 If This...Then What?
Mature Closed

Some mature large trees in a mix of smaller trees, large shrubs and even saplings. These forests are very dense and hard to walk through. You cannot see far in a mature closed forest and the multi-story trees provide ladder fuels.
Mature Open

Large, mature trees in an open and almost "park like" setting with clearly visible forest floor. These forests are easy to walk through and you can see through the trees a considerable distance. Grasses and smaller shrubs grow, but few or no small trees.
Pole Stage - Dense

Young trees become brushy, with limbs close to the ground and grow together tightly. Trees compete for space. The ground is “cluttered” and hard to see or to walk through.
Pole Stage – Open

Young trees with clear forest floor covered with grasses and a few smaller shrubs. It is easy to walk through an open pole stage forest.
Seedlings & Saplings

Seedlings and saplings are the first stage of growth for trees. Some require lots of sun and can’t tolerate shade. These are the first to take hold in open grassy areas.
Grasses and Shrubs

No trees, only grasses, wildflowers (forbs) and shrubs. This landscape supports wildlife, creates grazing areas for live stock and wildlife and often later, supports berry crops like huckleberry and others.
10.20 If This...Then What?
10.28 If This...Then What?
If This... Then What?
10.31 If This...Then What?
10.32 If This...Then What?
If This...Then What?
10.36 If This...Then What?
If This...Then What?
10.38 If This...Then What?
10.39 If This...Then What?
If This...Then What?
10.42 If This...Then What?
Key to Images

Introduction

This key will assist the teacher in interpreting the images presented above and include an explanation of the stage or stages represented in the image, along with discussion of images that captured multistage features on the land. It is intended to support teachers, but can be used also by students who may agree, disagree or even argue for different interpretations of these images. All images were in the aboriginal territory of the Salish and Pend d’Oreille with some taken near the Blackfoot River off MT Highway 200 and others taken on the Flathead Reservation. Western Montana students and their teachers could drive in any direction in aboriginal territory to capture similar images of their own. A take home assignment for students could be to take images of various representations of the succession cycle in their own back yard. Avoid forcing “right” or “wrong” answers as students work to interpret these images or images they take. The goal is to get them to debate and grapple with the natural mix, learning to see the stages mixed and manifest in the landscape. Guiding questions to support their interpretations could include:

- Where do you see (stage type)_____________?
- In what part of the picture is (stage type) ___________________?
- Are any parts different from other parts?
- What is the mix here?
- Can you identify from the image the nature of the disturbance in this area that may have resulted in this stage?

Key

<table>
<thead>
<tr>
<th>#</th>
<th>Succession Stage(s)</th>
<th>Explanation</th>
<th>General Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pole Stage - Open, or early Mature Open</td>
<td>Note that students could say mature open. The size of the tree determined to be “mature” is determined by species and diameter, which they may not be able to determine from the photo alone. It is a range and this stand is clearly approaching maturity for lodge-pole pine. Lots of sun between trees and a clear forest floor.</td>
<td>North of Potomac, MT at the west base of Greenough Hill, off MT Highway 200.</td>
</tr>
<tr>
<td></td>
<td>Pole Stage - Open, or early Mature Open</td>
<td>Note that students could say mature open. The size of the tree determined to be “mature” is determined by species and diameter, which they may not be able to determine from the photo alone. It is a range and this stand is clearly approaching maturity for lodge-pole pine. Lots of sun between trees and a clear forest floor.</td>
<td>North of Potomac, MT at the west base of Greenough Hill, off MT Highway 200.</td>
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</tr>
<tr>
<td>3</td>
<td>Mature Open</td>
<td>These large trees are clearly mature. Compare to image 1 and 2 to discern the difference here. Lots of sun between trees and a clear forest floor.</td>
<td>North of Potomac, MT at the west base of Greenough Hill, off MT Highway 200.</td>
</tr>
<tr>
<td>4</td>
<td>Mature Closed</td>
<td>Students may note the smaller trees and mistake this for dense pole stage, but the presence of mature trees in combination with multistage growth makes this mature closed. Just a few yards in and sun does not reach the ground and you can’t see far or walk easily through the forest.</td>
<td>Garnet Range Road, off MT Highway 200</td>
</tr>
<tr>
<td>5</td>
<td>Mature Closed</td>
<td>Students may note the smaller trees and mistake this for dense pole stage, but the presence of mature trees in combination with multistage growth makes this mature closed. Just a few yards in and sun does not reach the ground and you can’t see far or walk easily through the forest.</td>
<td>Garnet Range Road, off MT Highway 200</td>
</tr>
<tr>
<td>6</td>
<td>Mature Closed</td>
<td>Students may note the smaller trees and mistake this for dense pole stage, but the presence of mature trees in combination with multistage growth makes this mature closed. Just a few yards in and sun does not reach the ground and you can’t see far or walk easily through the forest.</td>
<td>Garnet Range Road, off MT Highway 200</td>
</tr>
<tr>
<td>7</td>
<td>Pole Stage - Dense</td>
<td>This is clearly closed or dense; however the large mature trees in the background are less prominent, making both pole dense or mature closed responses viable interpretations of the stage of this forest.</td>
<td>Garnet Range Road, off MT Highway 200</td>
</tr>
<tr>
<td>8</td>
<td>Pole Stage - Dense</td>
<td>This is clearly closed or dense; however the large mature trees in the background are less prominent, making both pole dense or mature closed responses viable interpretations of the stage of this forest.</td>
<td>Garnet Range Road, off MT Highway 200</td>
</tr>
<tr>
<td>9</td>
<td>Pole Stage - Dense</td>
<td>This is clearly closed or dense; however the large mature trees in the background are less prominent, making both pole dense or mature closed responses viable interpretations of the stage of this forest.</td>
<td>Garnet Range Road, off MT Highway 200</td>
</tr>
<tr>
<td>#</td>
<td>Section</td>
<td>Description</td>
<td>Location</td>
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</tr>
<tr>
<td>10</td>
<td>Pole Stage - Dense</td>
<td>This is clearly closed or dense; however the large mature trees in the background are less prominent, making both pole dense or mature closed responses viable interpretations of the stage of this forest.</td>
<td>Garnet Range Road, off MT Highway 200</td>
</tr>
<tr>
<td>11</td>
<td>Saplings and Seedlings</td>
<td>These saplings are progressing to pole stage dense (only determined here by estimates of size for lodge-pole pine).</td>
<td>Garnet Range Road, off MT Highway 200</td>
</tr>
<tr>
<td>12</td>
<td>Saplings and Seedlings</td>
<td>Clearly sapling or seeding stage in grassy meadow, so students could confuse with grasses and shrubs the presence of seedlings indicated the sapling and seedling stage.</td>
<td>East side of Greenough Hill off MT Highway 200.</td>
</tr>
<tr>
<td>13</td>
<td>Mature Closed</td>
<td>Students may note the smaller trees and mistake this for dense pole stage, but the presence of mature trees in combination with multistage growth makes this mature closed. Just a few yards in and sun does not reach the ground and you can’t see far or walk easily through the forest.</td>
<td>Garnet Range Road, off MT Highway 200</td>
</tr>
<tr>
<td>14</td>
<td>Mature Open</td>
<td>These large trees are clearly mature. Lots of sun between trees and a clear forest floor. The limbs on the trees are an indication that fire has not been here for a while and the mature open stand was created by some other disturbance. Can your students tell what that disturbance was?</td>
<td>North of Potomac, MT at the west base of Greenough Hill, off MT Highway 200.</td>
</tr>
<tr>
<td>15</td>
<td>Mature Open</td>
<td>Because the subject of this photo is the lupine blooming in the foreground students might say grasses and shrubs. But, looking at the size of the trees in the background, they will clearly see a mature and open stand.</td>
<td>North of Potomac, MT at the west base of Greenough Hill, off MT Highway 200.</td>
</tr>
<tr>
<td>16</td>
<td>Grasses and Shrubs</td>
<td>While a few trees stand in the background, this one should be clear.</td>
<td>Scotty Brown Road off of MT Highway 200, looking north.</td>
</tr>
<tr>
<td>17</td>
<td>Grasses and Shrubs</td>
<td>While a few trees stand in the background, this one should be clear.</td>
<td>Scotty Brown Road off of MT Highway 200, looking north.</td>
</tr>
<tr>
<td>18</td>
<td>Grasses and Shrubs</td>
<td>Clearly grasses and shrubs.</td>
<td>Ovando/ Helmville Road, looking north toward Bob Marshall and Scapegoat Wilderness areas.</td>
</tr>
<tr>
<td>19</td>
<td>Saplings and Seedlings</td>
<td>Clearly sapling or seeding stage but the presence of what appears to be mature or large pole stage trees in the background could cause students confusion. Ask, what is most prominent in the image?</td>
<td>East side of Greenough Hill off MT Highway 200.</td>
</tr>
<tr>
<td>20</td>
<td>Pole Stage - Open, or early Mature Open</td>
<td>Note that students could say mature open, or looking at the pasture in the foreground, might even say grasses and shrubs or saplings and seedlings. Also, the size of the tree determined to be “mature” is determined by species and diameter, which they may not be able to determine from the photo alone. It is a range and this stand is clearly approaching maturity for lodge-pole pine. Lots of sun between trees and a clear forest floor.</td>
<td>North of Potomac, MT at the west base of Greenough Hill, off MT Highway 200.</td>
</tr>
<tr>
<td>21</td>
<td>Pole Stage - Open, or early Mature Open</td>
<td>Note that students could say mature open. The size of the tree determined to be “mature” is determined by species and diameter, which they may not be able to determine from the photo alone. It is a range and this stand is clearly approaching maturity for lodge-pole pine. Lots of sun between trees and a clear forest floor.</td>
<td>North of Potomac, MT at the west base of Greenough Hill, off MT Highway 200.</td>
</tr>
<tr>
<td>22</td>
<td>Grasses and Shrubs</td>
<td>While a few trees stand in the background, this one should be clear. Again, what clue can they find that could tell the nature of the disturbance? (Snag in background could be an artifact of fire.)</td>
<td>Flathead Reservation, north-facing hill near Magpie Creek</td>
</tr>
<tr>
<td>23</td>
<td>Seedlings and Saplings</td>
<td>While a few trees stand in the background, this one should be clear. Again, what clue can they find that could tell the nature of the disturbance? (Snag in background could be an artifact of fire.)</td>
<td>Flathead Reservation, north-facing hill near Magpie Creek</td>
</tr>
<tr>
<td>24</td>
<td>Pole Dense or Closed</td>
<td>Smaller trees, low brushy limbs and encroaching seedlings and saplings.</td>
<td>Flathead Reservation, north-facing hill near Magpie Creek</td>
</tr>
<tr>
<td>25</td>
<td>Pole Open</td>
<td>Smaller trees, with little brush or few encroaching seedlings and saplings.</td>
<td>Flathead Reservation, north-facing hill near Magpie Creek</td>
</tr>
<tr>
<td>26</td>
<td>Mature Open</td>
<td>Big trees, grasses and wild flowers, growth allowed resulting from mature trees with little or no brush, seedlings, saplings etc.</td>
<td>Flathead Reservation, near Revais Creek</td>
</tr>
<tr>
<td>27</td>
<td>Mature Closed</td>
<td>Big trees, dense, brushy ladder fuels, limbs, small trees along with large, mature trees.</td>
<td>Flathead Reservation, near Revais Creek</td>
</tr>
</tbody>
</table>
“I’m not sure all the reasons why the Tribes utilized fire as much as they did, but what I found is the tribes didn’t do many things that didn’t have a purpose. I think they saw great benefits from fire and utilized it a great deal whether it be in hunting, cleaning a site, cleaning a trail, signaling...to manipulate plants around their campsites...for horses, medicines, camas, bitterroot; to drive game; in war, to provide protection to someone who is trying to get away. No one was there to put these fires out...[they] burned enormous amounts of acres [and had a] great influence on what shaped the Rocky Mountain ecosystems.”

— Ron Swaney
CSKT Fuels Manager
Fire Managers

Cultural Value: Respect, Observation, Listening

Rationale
Fire managers apply findings from research, knowledge passed down from our elders, and their direct observations on the land to understand the role of fire in creating and sustaining healthy forests. Their knowledge takes into account thousands of years of use of fire on the land in an effort to manage fire today. To learn from the experience of the fire managers, listen to their interviews with care.

Learning Targets
- I know sources of information used by fire managers to predict fire behavior and develop plans to manage fire.
- I recognize concepts of fire ecology and am aware of how fire managers apply these concepts when developing fire policy.
- I identify impacts of fire exclusion and suppression on the land.
- I know several jobs related to fire management, science, or suppression.
- I listen attentively.
- I summarize or paraphrase key ideas and information from an oral interview.
- I record information to remember and share with others.
- I work effectively and respectfully with a partner.
- I teach others what I have learned.

Resources
Fire on the Land DVD (Disk 1) or you can use the Curriculum DVD (this DVD), which contains the full contents of Disk 1.
Computer with DVD player for whole-group presentation and possible use of library or lab setting with head phones, to allow individual independent practice
PC projector or projector and electronic white board
Fire manager question and gist-summary forms, one on each manager for each student (gist means the essence or main point).

Instructional Techniques
Interpreting manager interviews from DVD, attentive and active listening, whole-group and individual summary and paraphrasing, partner sharing

Time Frame
One 50-minute class period, depending on the grade level of the students
1st period for whole-group example followed by team-work and independent practice
Suggested Grade Levels

Grades 4-12

Procedures articulated below are targeted to the students in grades 5-8. However, with suggested adaptations following the procedures section, these may be useful for grades from 4 to 12.

Procedures

1. Distribute handouts with questions from Fire Managers interviews to the whole class.

2. Tell the class that they will be responsible for careful listening, followed by summarizing from the interviews of various fire managers. In this way they will practice three skills: listening, hearing the gist, and recording the gist in the form of a summary. This time, they will be required to work independently.

3. Project the Fire Managers Interview section of the Fire on the Land DVD and start with the interview of Tony Harwood (click the button at right and go to Interviews>Fire Manager Interviews).

4. Moving question by question, have students write a summary statement in their own words of Mr. Harwood’s responses. Use the following protocol.
   - Tell students to read the question, then you re-read it aloud.
   - Pens down, all ears, listen to the response to the question.
   - Pen in hand, take two or three minutes to summarize on the handout provided.
   - Pair up.
   - Share responses with a partner. Together determine which category you fall in from the following:

```
<table>
<thead>
<tr>
<th>Both Got the Gist</th>
<th>Both Missed the Gist</th>
</tr>
</thead>
<tbody>
<tr>
<td>You Got It, I Missed It</td>
<td>I Got It, You Missed It</td>
</tr>
</tbody>
</table>
```

Get the Gist?

The Merriam-Webster dictionary defines the word gist as “the main point or part; the essence.” Discuss this with your students. It is more helpful to deeply understand the essence of an idea or concept - to get the gist - than to be able to recite the exact words with limited understanding.
• Work together for up to five minutes until you “Both Got the Gist!”
• You may select to repeat the pair-share activity until students feel confident in their summaries.

5. Proceed through all the questions.
6. Continue for the second interview, projecting it to the class and requiring students to independently summarize and take notes on the forms provided.
7. If time runs out before you finish all three, have students work independently over the next few days using free time or cycling through as time allows in a computer lab or library. There is important content presented by each manager on fire science, employment in fire management, and community-based problems and concerns.
8. Collect the data forms from students to examine for evidence of their ability to listen for the gist and write short summary statements. These are helpful study strategies and summarization is a writing skill that will be used throughout life.

**Assessment**

- Fire manager question and gist-summary forms
- Direct observation of collaborative work with partner
- Direct observation of independent work, self-directed

**Adaptations**

The following adaptations are a starting point to support your efforts to meet the needs of every learner. Grade levels here are only a suggestion and would not preclude use of a great 3rd grade strategy with a 9th grader or vice versa.

**Grades K-3 (or students at any level who need more support)**

For younger students you may need to provide different supports and model the process. The following procedural options could be a place to start.

1. For this age group, consider omitting this lesson or allowing open-ended exploration of the DVD during free time. Some of this material is technical in nature and may be developmentally challenging for students of this age.

**Grades 9-12 (or students at any level who require greater challenge)**

Older or more advanced students should be given more responsibility and can conduct research via the web links and the “Bibliography” and “Resources” sections of the *Fire on the Land* DVD (Disk 1). They should be encouraged to develop personally or locally relevant projects coinciding with their study of *Fire on the Land*, possibly including vocational or service learning projects.

1. Students in this age group may be interested in knowing more about fire careers and wildland fire fighting. Invite a Fire Manager to your class
to talk about opportunities in fire, natural resource management or forestry.

2. Classes are required for wildland firefighters to ensure safety. Consider linking interested students to courses required for red card certification offered by the CSKT Division of Fire Management, BLM, USFS, or DNRC. These courses provide an excellent introduction to fire behavior and, for the motivated, an opportunity for post-secondary employment and education.

3. Use the DVD to support exploration of fire management plans, contemporary fire history, prescribed burn plans, and other issues under the Fire Management Today tab.

References
## Tony Harwood

<table>
<thead>
<tr>
<th>Question</th>
<th>Notes</th>
<th>Gist Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>How large an influence did traditional burning by Salish and Kootenai people have on the frequency of fire in this area of the northern Rockies?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>On the Reservation, most people live at lower elevations and on the valley floor. What role does fire play there, and how do you manage fire in that zone?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What has the consequence of fire exclusion been in the Northern Rockies?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can you talk more about the consequences of excluding and suppressing fires for one hundred years or longer?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What have been some of the ecological consequences of eliminating the role of fire in terms of species (both trees and wildlife) and forest disease?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How is the Fire Management Program here on the Reservation responding to the consequences of 100 years of fire exclusion?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Ron Swaney

<table>
<thead>
<tr>
<th>Question</th>
<th>Notes</th>
<th>Gist Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is your job here on the Flathead Reservation?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What is a prescribed fire?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How much prescribed burning do you do each year here?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>When do you do most of your prescribed burning?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What kinds of areas do you burn with prescribed fires?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What are some of the benefits you expect to see from prescribed fire?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does huckleberry benefit from prescribed fire?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does camas benefit from prescribed fire?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does aspen benefit from prescribed fire?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What about big game species? Do they benefit?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What is your view on the value of prescribed fire as a management tool?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How large an impact did traditional burning have?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Bob McCrea

<table>
<thead>
<tr>
<th>Question</th>
<th>Notes</th>
<th>Gist Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is your job here?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Why do we sometimes prescribe fire and other times suppress it?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What is the fire suppression policy for the Tribal Wilderness?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can you ever let a fire burn in the Wilderness?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A lot of people live in the foothills. How does that affect management?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What is your advice to people who live in the Wildland-Urban Interface?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are there dangers associated with reintroducing fire?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fighting fire is often a multi-generational occupation on the Reservation. Is this true of your family?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Why do you think firefighting is such an important and common occupation on this and other reservations?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
"The term fire regime refers to the kind of fire behavior that occurs in an area. Although fire exclusion policies have changed the fire behavior and vegetation within these zones, fire regimes reveal basic information about how our ecosystems functioned before the days of fire suppression."

— Flathead Indian Reservation Forest Management Plan, 2000
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Fire Behavior Game

Cultural Value: Relatedness, Humor, Level-headedness

Rationale
Over countless generations, tribal knowledge of fire was used to predict the effects of fire on the land. This knowledge enhanced the positive impacts and diminished the potential damaging consequences of fire. With changes disrupting the use of fire, awareness of fire behavior has diminished. At the same time, we live in a landscape where the loss of fire’s use as a tool has dangerous consequences. Everyone needs to understand the basics of fire behavior and the variables that make that fire beneficial—or deadly.

Learning Targets
- I understand the basics of fire behavior and critical variables impacting fire behavior.
- I predict fire behavior based on differences in the land, fuel load, moisture content and weather conditions.
- I distinguish between lethal and non-lethal regimes, and the conditions on the ground contributing to each.
- I estimate relative speed, intensity and lethality of fire under certain conditions, applying my knowledge of fire behavior.
- I work cooperatively in a small group.
- I recognize “look out” situations, and am aware of potential “safety zones” when in the backcountry.

Resources
Fire on the Land DVD (Disk 1) or you can use the Curriculum DVD (this DVD), which contains the full contents of Disk 1.
Computer with DVD player for whole-group presentation
PC projector or projector with electronic white board
Internet access
Timer tools (download from online timers)
Markers (or dry erase markers) in many colors
Chart paper or white board space for each group
Game cards in four categories, each category printed on a different color, cut apart (see attached)

Instructional Techniques
Direct instruction, small-group process, simulation, game using “Pictionary”, or story-board techniques

Time Frame
One 50-minute class period pre-teach and review fire behavior concepts, play game predicting fire behavior, debrief on watch-out situations
Suggested Grade Levels
Grades 4-12

Procedures below target students in grades 5-8. However, with suggested adaptations following the procedures section, these may be useful for grades from 3 to 12.

Procedures
1. Using the Fire on the Land DVD (click the button at right), review the basics of fire behavior found under Fire Ecology>Fire Concepts. Examine fire regimes under Fire Ecology>Fire Regimes.

2. Remind students of their own experiments examining the fire triangle if you conducted them.

3. You may extend the instruction on this topic by sharing this presentation available online on wildfire behavior from [http://www.rockymountainwildlandfire.info/firewise/firebehavior_09.htm](http://www.rockymountainwildlandfire.info/firewise/firebehavior_09.htm) to activate prior knowledge.

4. Have students turn chairs to face a partner. In pairs, have them conduct a discussion based on what they have learned so far about fire behavior. The following questions might be used by the teacher to ignite discussion if students aren’t sure where to begin.
12.5 Fire Behavior Game

- What will ignite more quickly? Dry leaves or three-inch-diameter split firewood? Why?
- What will burn more intensely, fallen pine needles or live willow limbs? Why?
- What will burn longest? A ten-inch-diameter log of ponderosa pine, or a five-inch-diameter log? A large box filled with dry twigs trimmed from a lodgepole pine, or a single five-inch-diameter log of lodgepole pine? Why?
- Where does fire burn more intensely? On a slope or on a flat valley bottom? Why?
- Where is the safest place to be if a wildfire ignites? Above it on the hillside? Below it on a hillside? Why?

5. Remind the class of the following rules of fire behavior: The intensity, duration, speed and direction of a fire depend on:
   - What is available to burn?
   - What is the condition or dryness of available fuel?
   - What is the closeness (proximity) of fuel sources (duff, surface, ladder, crown)? The farther the distance the lower or slower the spread.
   - What is the lay of the land or topography? Flat or sloped?
   - What is the weather, including dryness, heat and wind?

6. Reseat partners to create groups of four.

7. Introduce and play the game to help students think through or predict fire behavior based on what they now understand about fire.

8. Each group draws four cards, one from each deck representing Earth, Water, Wind and Fire.
   - The Earth deck presents different types of topography and fuel load.
   - The Water deck addresses moisture levels of the fuels.
   - The Wind deck provides information on current weather and weather trends.
   - The Fire deck indicates an ignition source.

9. Each group will be allowed time to create a storyboard, map or drawing showing the behavior of fire specific to the cards they have drawn.

10. When the timer goes off, students stop working and report out to the rest of the class their group’s prediction of how fire will behave given the variables.

11. Ask students, “Using the rating form attached, think about speed, intensity, and lethality of the fire. Where would it fall?”

12. Ask students, “Given what you know, draw an ‘X’ on the drawing where you think your safety zone might be and why. What would you use as an escape route given what you know? Draw an arrow showing where you would go.”

13. After the first round and debrief, have groups continue the game, returning their old cards and drawing new cards and drawing or mapping their best prediction of behavior. Provide groups with copies of the rating form to think through the variables of speed of spread, intensity, and lethality.

14. Rove the class to monitor whether students grasp the basics of behavior and provide support.

15. When done, have students conduct an “after-action analysis,” reflecting and discussing in their groups how they did as a team predicting fire behavior and identifying safety zones and escape routes based on their imagined incident maps. Ask the standard questions of incident review to reinforce how firefighters work to increase their own safety in the field. Allow time to discuss.
   - What was planned?
   - What really happened?
   - Why did it happen?
   - What can we do better next time?

16. Close the class with a whole-group debrief and discussion of “red flag” conditions and basic safety if caught near a wildland fire.
Assessment

- Team sketches based on fire variables
- Individual identification of safety zones
- Direct observation of team-work

Adaptations

The following adaptations are designed to support your efforts to meet the needs of every learner. Grade levels here are only a suggestion and would not preclude use of a great 3rd grade strategy with a 9th grader or vice versa.

**Grades K-3 (or students at any level who need more support)**

1. Invite representatives of local fire departments or fire fighting agencies in to your classroom for a match-safety or fire-safety presentation.
2. Conduct a discussion with students of differences between beneficial and damaging fires. Discuss how fire is used to improve the land and can actually prevent dangerous fires. Contrast this with structural fires that are always devastating to those who lose homes or property.

**Grades 9-12 (or students at any level who require greater challenge)**

1. Classes are offered in the basics of fire behavior and are required of all wildland firefighters. Find out where these are offered in your community and inform students. High school seniors may have an interest in pursuing wildland firefighting as a form of seasonal employment.

References

Rate Relative Behavior - What do you think?

- Slow Spread
- Low Intensity
- Non-Lethal
- Rapid Spread
- High Intensity
- Lethal
<table>
<thead>
<tr>
<th>Open meadows and pasture land that has been recently grazed. Flat valley bottom.</th>
<th>Gentle rolling hills with sage, native grasses and flowers in abundance.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steep canyon, heavy timber with ladder fuels. No evidence of logging or previous fire activity. Log home located with a view from the ridge top.</td>
<td>Lodgepole pine stand on the valley bottom. Wind storms the previous season dropped 40%, creating a tangle of dead trees on the ground.</td>
</tr>
</tbody>
</table>

Earth Cards (next three pages) – Select a different color card stock for each of the four card types, print and cut apart.
<table>
<thead>
<tr>
<th>Rugged, mountainous, terrain with a mix of “old growth” mature ponderosa pine and Douglas Fir growing in the understory at various stages. No homes near, designated Wilderness.</th>
<th>Gulch located near a large town with extensive development on 5- to 10-acre timbered parcels. Large homes built in the timber.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Riparian area located near a creek which flows year round. Willow, dogwood, cottonwood and aspen dominate the creek banks and nearby meadow land.</td>
<td>Open pole stand in area selectively logged and impacted by lightning-caused fires (two in the past 11 years.) Trees, while not yet mature, provide dappled shade and huckleberry crops are abundant.</td>
</tr>
<tr>
<td>A trail frequently used by hikers and packers cuts through 3 miles of “dog hair” lodgepole. The trees are so dense that none grows more than a few inches in diameter and you can’t walk or see through it. Trail like a tunnel.</td>
<td>Huge ponderosa pines in an open stand with lupine, arrowhead balsam root and paint brush covering the gently sloping forest floor.</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Large open meadow on the edge of mature stand of Douglas Fir. Meadow supports wild onion and camas as well as native grasses and flowers in abundance. Saplings and seedlings are beginning to encroach in the transition between the meadow and the timber.</td>
<td>Eighteen homes located at the end of a single lane road in an older home site. The area, while flat, is heavily timbered with a multi-age mix of older lodgepole and Douglas Fir growing around and among the houses.</td>
</tr>
<tr>
<td>Water Cards (next three pages) – Select a different color card stock for each of the four card types, print and cut apart.</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td></td>
</tr>
<tr>
<td>As you walk, you hear “crunch, crunch, crunch.”</td>
<td></td>
</tr>
<tr>
<td>Thick green grass covers the ground.</td>
<td></td>
</tr>
<tr>
<td>All fine fuels are totally dry.</td>
<td></td>
</tr>
<tr>
<td>On a day hike, you stop and sit to eat lunch. When you get up, you can feel the dampness from the ground on your clothes.</td>
<td></td>
</tr>
</tbody>
</table>
Heavy snow fall and extensive spring rains have soaked the area.

Golden brown grasses rattle when the wind blows.

There is dew on the grass each morning and noticeable condensation on car windows.

Heavy dust rises off the trails and dirt roads.
When you catch the occasional low-hanging branch or twig, it snaps off easily in your hand.

Mud has made trails and logging roads in the area difficult to drive.

The foliage and grasses have the color common to late spring or early summer with moisture levels on a 2- to 300-point scale sitting around 200.

The foliage and grasses have the color common to late summer as many plants go dormant, with moisture levels on a 2- to 300-point scale sitting around 60.
**Wind Cards (next three pages)** – Select a different color card stock for each of the four card types, print and cut apart.

<table>
<thead>
<tr>
<th>Temperature is 76 degrees and winds are calm; sky is partly sunny.</th>
<th>Temperature tops 100 degrees for the 7th day in a row, breaking a record for July. Clear sky with calm winds anticipated.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature is 97 degrees and winds are blowing from the west at a rate of 5 to 10 mph. Clear skies and low humidity.</td>
<td>Temperature is 60 degrees with rain storms throughout the day and winds are light at 5 mph from the north.</td>
</tr>
</tbody>
</table>
Dry lightning and a combination of strong winds and low humidity are predicted from 1 PM to 6 PM this afternoon. Fire weather is anticipated as an extended dry period will follow this front over the coming two weeks. Winds could be high or erratic. RED FLAG WARNING.

Evening thunder storms with lightning probable and high winds anticipated. Temperatures in the upper 80s to low 90s.

Unusual early snow storm nips summer in the bud. One to two inches anticipated with temperatures later in the day rising to the low 40s.

Red Flag Warning. The extended dry conditions will be compounded today by high, dry winds and multiple strong thunderstorms anticipated to produce little moisture and lots of lightning. Fire dangers already extreme.
Temperatures in the 80s with a 40% chance of rain. Storm clouds build until 10 PM with chance of thunderstorms including possible hail.

Gusty winds expected, no clouds or precipitation anticipated.

Morning light rain followed by heat in the afternoon. Winds mild and from the west.

Severe wind warning with possible cells or microburst activity in isolated areas. Take cover. Watch for falling trees, limbs or debris.
Fire Cards (next three pages) – Select a different color card stock for each of the four card types, print and cut apart.

<table>
<thead>
<tr>
<th>Lightning anticipated, with few strikes reaching land.</th>
<th>Lightning from multiple cells likely to produce 100s of strikes over the area.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fire wood gatherer’s chainsaw throws sparks.</td>
<td>Prescribed burn from two weeks ago flares.</td>
</tr>
</tbody>
</table>
12.18 Fire Behavior Game

Dry lightning storm.

Hold-over fire flares three weeks after storm.

Campfire left unattended.

Careless smoker tosses cigarette along road or trail.
| Heavy equipment overheats and ignites grass near construction sight. | A truck on the interstate accidently drags a tow chain, showering sparks as it goes down the highway. |
| An ATV backfires, producing a spark while illegally driving off-road. | Downed power line creates a shower of sparks. |
“Defensible space—the area around a structure where fuels and vegetation are cleared or reduced to slow the spread of wildfire towards the structure—provides room for firefighters to do their jobs safely and successfully. A house is much more likely to withstand a wildfire if grasses, brush, trees, and other common forest fuels are managed. A little work before a fire can save a lot of house.”

— Factsheet on Creating Defensible Space
Rationale
In our tradition, generosity and helpfulness are highly valued. Individuals and families in need in our community are cared for, and the young extend a helpful hand to the elders. Living on land crafted by tribal use of fire, care must be taken to maintain the balance among the needs of wildlife, plants, and human beings. With care and preparation, homes in or near wildland can be relatively protected from fires that are required to restore balance to the land. In this lesson, students will take what they have learned to the field and help a member of their community to reduce the chance of loss of their home to wildfire. Students will learn strategies to help people coexist with fire on the land today.

Learning Targets
 I identify wildland-urban interface area and assess the risk of loss to homes in these areas from wildfire.
 I manage time, tasks, and develop and execute a plan cooperatively with my group.
 I work to help others in my community.
 I identify defensible space.
 I analyze fuels to determine likeliness of combustion.
 I reduce fuels near a home to make space more defensible.
 I document improvements to make a home more defensible.
 I teach others how to make small changes that can save homes in the event of wildland fire.

Resources
Fire on the Land DVD (Disk 1) or you can use the Curriculum DVD (this DVD), which contains the full contents of Disk 1.
Computer with DVD player for whole-group presentation and possible use of library or lab setting with head phones to allow individual independent practice
PC projector or projector with electronic white board
Internet access (for video) on WUI and creation of defensible space
String (four to six pieces measured in 100-ft lengths)
100-ft measuring tape
Compass or GPS
Flagging tape in three colors (one for the 10-ft, 30-ft, and 100-ft increments from structure)
Stakes (several dozen, to mark perimeter of work area and zones)
Rakes
Shovels
Tree and shrub pruning tools (optional, depending on site, students' age, adult supervision available, costs, and homeowner's needs)
With Our Own Hands

Cultural Value: Helpfulness, Cooperation, Generosity, Endurance, Strength, Gratitude

Rationale
In our tradition, generosity and helpfulness are highly valued. Individuals and families in need in our community are cared for, and the young extend a helpful hand to the elders. Living on land crafted by tribal use of fire, care must be taken to maintain the balance among the needs of wildlife, plants, and human beings. With care and preparation, homes in or near wildland can be relatively protected from fires that are required to restore balance to the land. In this lesson, students will take what they have learned to the field and help a member of their community to reduce the chance of loss of their home to wildfire. Students will learn strategies to help people coexist with fire on the land today.

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- I identify wildland-urban interface area and assess the risk of loss to homes in these areas from wildfire.
- I manage time, tasks, and develop and execute a plan cooperatively with my group.
- I work to help others in my community.
- I identify defensible space.
- I analyze fuels to determine likeliness of combustion.
- I reduce fuels near a home to make space more defensible.
- I document improvements to make a home more defensible.
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Flagging tape in three colors (one for the 10-ft, 30-ft, and 100-ft increments from structure)
Stakes (several dozen, to mark perimeter of work area and zones)
Rakes
Shovels
Tree and shrub pruning tools (optional, depending on site, students’ age, adult supervision available, costs, and homeowner’s needs)
Metal screening (optional, depending on site, costs, and homeowner’s needs)
Staple guns (option, depending on site, costs, and homeowner’s needs)
1 parent or adult volunteer for every four students (depending on age and level of independence)
Digital camera or video camera to document before and after
Sack lunches or cookout foods (optional, depending on time spent in the field)
Gloves, glasses, long sleeved shirts, closed toe shoes, sunscreen, and any other protective gear required

**Instructional Techniques**

Video, service learning, hands-on field experience, cooperative learning, project-based learning

**Time Frame**

*Advance work* devoted to student selection of site for project based on community need, view video on defensible space, discuss strategies, plan field experience, determine tools required and assign them, write letter to parents requesting volunteers and tools, fundraising for supplies or food (as required) (procedure steps 1-23)

*Full day field experience* hands-on service-learning project analyzing fuels, identifying defensible space, improving defensible space at a home in the community (procedure steps 24 - 42)

*Follow-up* allow time following the field experience to view the video or slide show of photos taken before and after and to discuss outcomes, final exit ticket, or reflection on *Fire on the Land* study (procedure steps 43 - 48)

**Suggested Grade Levels**

Grades 4-12

Procedures below target students in grades 5-8. However, with suggested adaptations following the procedures section, these may be useful for grades from 3 to 12.

**Procedures**

*Advance work - 1st period*

1. On chart paper, have students in groups make a standard KWL three column format to record what they know or think they know about defensible space, what they wonder or want to know about creating defensible space, and later, what they learned resulting from their research.

<table>
<thead>
<tr>
<th>We Know...</th>
<th>We Wonder...</th>
<th>We Learned...</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tbody>
</table>
2. Allow groups time to write what they know on their charts and pose questions regarding what they wonder.

3. Have students in their groups conduct 20 minutes of Internet research on defensible space, wildfire. The following sites may be helpful:
   - www.ext.colostate.edu/Pubs/natres/06302.html
   - www.calmast.org/sbc/html/defensible_space.asp
   - www.fire.ca.gov/cdfbofdb/PDFS/4291finalguidelines2_23_06.pdf
   - www.fire.ca.gov/communications/downloads/fact_sheets/Checklist.pdf
   - www.fire.ca.gov/communications/downloads/fact_sheets/DefensibleSpaceFlyer.pdf
   - www.his.state.mt.us/education/textbook/Chapter12/WorksheetsFinalch12-2.pdf
   - www.charkoosta.com/2007_09_13/Populated_wildland-urban_interface_present_fierce_wildfire_threat.html

4. As they research this topic, have them note specific tasks or strategies that homeowners can use to create defensible space in the “We Learned” column.

5. After research is completed, invite groups to report their findings.

Advance work - 2nd period and beyond

6. Determine areas considered to be wildland-urban interface using maps of the local area.

7. Take students on Google Earth and Google Maps tours of these areas. Google Earth is very useful for seeing “fuel load” on the land and you can now drill down to an individual residence using “street view.” With this tool it is possible to do a virtual site-visit or pre-workday assessment.

8. Ask students if they know anyone living in these areas that could use help or go to your local fire protection agency for ideas on individuals who need help creating defensible space.

9. Determine a candidate for the field experience site who would welcome and benefit from development of defensible space.


11. Go back to Google Earth and/or video or photos of the home selected for the project. Ask students:
   - What do we need?
   - Who can help?
   - How do we need to prepare?
   - What does the home owner want?
   - Who can approve our field trip, transportation?
   - What will we eat?
   - Can material removed be burned? Where? How? Is a permit required? If so, how do we apply?
   - Will material removed need to be hauled away? If so, who can help?

12. Break students into groups and have them brainstorm categories of tasks that need to be addressed in planning the field work day. Allow five to ten minutes for them to generate categories that will potentially become working committees. Examples might include:

PREPARATION WITH THE HOMEOWNER

Preparation with the homeowner is critical to the success of this field experience. Once a suitable site has been determined and contact made with a willing homeowner, the teacher will need to make a visit to the home and spend time determining with the homeowner what they would like to have done. Clearly determine the scope of work in advance and remove no material if not expressly approved by the homeowner. While conducting this advance work on-site, it would be helpful for the teacher to take photos or video of the home and area around it along with any project focus areas. This can be used later in the classroom to help prepare students. This is also a good time to examine the area for any potential hazards (body of water, crumbling porch, snag or dead limbs overhead, etc.) in order to establish a “watch out” procedure for the field experience day.
13.6 With Our Own Hands

- Tools (list, borrow, assemble, clean, and return)
- Volunteer help (parents, other volunteers, local fire agency)
- Lunch
- Permissions and approval (school, parents)
- Homeowner liaison (determine exactly what the homeowner wants and needs done)
- Transportation (bus, parent volunteers, walking)
- Videographer/Photographer
- Site plan/Chore list
- Safety
- Fundraising (if needed for supplies or food)

13. Debrief whole class by putting their brainstormed categories on the board. Determine which will be required for the field-experience day based on your community and site location.

14. Put the names of each task on a slip of paper and drop into a hat or container.

15. With students in working groups of four or so, have each group draw a category to plan determining what will be required, who can provide it, etc.

16. Have each group brainstorm and create a plan in their assigned area. Require students to list tasks in a logical order on chart paper.

17. Each group reports back to the class regarding their plan and the class provides support for missing elements from each group’s plan to ensure they are complete. Once revised with feedback, plans are posted in the room to remind students of advance work required.

18. Allow work time during the day for the groups to get started on their chores. (Phone calls, determine date with homeowner, timeline, letter writing, notes home requesting volunteers or tools, letters to local businesses for supplies, etc.)

19. At the close of the kick-off planning day and at key intervals over the weeks prior to the field experience, assign homework securing tools and parent/volunteer support and remind students of the needs of various groups. Keep them on task by referring them back to their chart lists. Check off items as they are completed and make notes on the charts (funds raised, individuals volunteering, etc.)

20. Have students write and send reminder notes to parent volunteers one week prior to the field experience.

21. Several days before the field experience, have students review their lists to ensure all logistics are in place, assemble tools, etc.

**Full-day field experience**

22. Transport and assemble students, volunteers, and tools to work site.

23. As a whole group, conduct a review of the site, determining the four directions, including the direction from which the winds and storms generally come, as well as the hotter and dryer exposures on the property.

24. Have the class examine the slope and topography on which the home is located. Flat? Sloped? To what degree? What does that mean for wildfire threat mitigation?

25. Have students, along with the homeowner, look at fuels and fuel load in general on the property. What kinds of trees, grasses or vegetation are there? How is it landscaped and maintained?

26. With the help of the homeowner, examine the tasks to be completed. Are there any special “trouble spots” (For example, a wood pile that needs to be moved, or bark ground cover, etc., that should be cleared.) What does the homeowner need done?

27. What hazards or “no go” areas exist on the property? Note these along with instructions for students to “Stay Away.” You can also flag these areas with orange flagging.
28. Have the homeowner note things he or she does not want disturbed. Note and flag these with instructions, “Do Not Touch.”
29. Place students into at least four working groups depending on the scope of work required at the site and assign one adult supervisor to each group.
30. Be sure to assign photographers or videographers to capture pre-work photos!
31. Have each group measure off a piece of string 100-ft long and tie a piece of flagging tape in one color at the 10-ft mark and then again in another color at the 30-ft mark. Be sure teams are using the same color as indicators at each mark.
32. Assign student groups to different sides of the home.
33. Have groups use their measuring string and flags, flagging tape attached to stakes, etc., to determine 3 rings around the home, 1st at the 10-ft mark, 2nd at the 30-ft mark and the 3rd and last at the 100-ft mark.
34. Now that they have identified defensible space surrounding the home, have students conduct a quick review of fuels found in these different rings with each group assigned a different side of the home. Look at grasses, grass length, ground cover, flammable shrubs, low limbs on trees, trees close to the house, leaves, pine needles, and other fuels. Have students gather samples, determining fine fuels and rating them for dryness. (Crunch test, green, feels moist, etc.)
35. Begin project work, raking or removing flammable materials selected to be removed by the homeowner, working from the house out in the concentric rings of defensible space.
36. Depending on the age of your students and the level of adult supervision available, students may be assigned to prune shrubs and low tree limbs, and high school students with support may remove pine needles from gutters, or screen in unenclosed areas under decks, etc.
37. Assign students to rotate through special projects, like relocating a wood pile, as these tasks can be more physically demanding.
38. Debris will need to be bagged and hauled away, or if allowed, may be burned depending on time of year, permits, and other restrictions.
39. Have students share duties as photographer and videographer and always assign each group a safety officer whose job is to look out for dangerous situations and the well being of the group.
40. When the work is done, celebrate with a picnic lunch or a cookout if possible.
41. If possible, return tools at the end of the workday.

Follow-up

42. Take time at the end of the day to conduct a whole-class after-action analysis following the model of professional firefighters and emergency response personnel. Ask the following questions and record the classes responses on the board:
   • What was planned?
   • What really happened?
   • Why did it happen?
   • What can we do better next time?
43. Be sure all tools are cleaned and returned to their owners. Student committee assignments may be used.
44. Assign each group to write thank you letters to volunteers, donors (if any), and the homeowner. If agencies supported the project or extended help, be sure to write letters of appreciation. You can raise the stakes for students by publicly thanking agencies and others via a letter to the editor of a local newspaper. Be sure students go through all phases of the writing process and submit a letter with no mechanical errors.
45. Assign one group of students to manage video or digital photos, tagging with names, date, project, etc., and then importing image into a photo album or movie. Edit and add music.
46. Allow a full class period for students to write a final reflection in field notebooks or the attached exit ticket answering the following questions:
   • Now, what do you know about the traditional use of fire?
   • What have you learned about the importance of fire to the ecosystem?
   • What do you know about how fire behaves?
   • What skills do you have for helping people and fire coexist in a fire-dependent ecosystem?
   • What kind of group participant were you?
   • Would you recommend this study of Fire on the Land to others? Why, or why not?
47. Have them turn in the exit tickets before the end of class.
48. Allow time to view the photo album, movie or videos now, or at the end of your school year as you celebrate your accomplishments and contributions to your community.

Assessment
➢ Group plans, task lists with completion dates and notes.
➢ Defensible space research KWL charts.
➢ Direct observation of participation in field work project.
➢ Field work pre and post images, photo album, or video.
➢ Final reflections written in field notebook or on exit ticket form (attached).

Extensions
1. If you are implementing this investigation fully, integrating all content areas, consider adding a project asking students to design a “fire-wise home” based on what they know. Younger students can draw their designs free hand or to scale using graph paper. Older students can be introduced to design software or CAD systems and do technical drawings using computers. Be sure to remind them of all the elements of defensible space introduced in this project.
2. Invite students to conduct a “fire wise” assessment of their own home. Provide them with a check list of items they can share with a parent.
3. Extend the service-learning elements from here to their own backyards, inviting students to document improvements they have made (with parents’ approval) to their own home’s defensible space using digital images.

Adaptations
The following adaptations are designed to support your efforts to meet the needs of every learner. Grade levels here are only a suggestion and would not preclude use of a great 3rd grade strategy with a 9th grader or vice versa.

Grades 3-4 (or students at any level who need more support)
1. The younger your students, the lighter the work load and the simpler the tasks. Raking may be their primary focus for creating defensible space.
2. See if a local fire crew, service group or representatives of a fire management department would be willing to come with your students on the field-experience day to support their efforts, and teach students about defensible space.
Grades 9-12 (or students at any level who require greater challenge)

1. High school students should be expected to plan the field experience day with greater levels of independence and accountability.

2. Consider having students in this grade level teach what they learned to younger students or even partner with a younger group on the field experience day to actually do the work. They can use the videos to show younger students the nature of defensible space and how to help create it around homes.

3. Students at these grade levels should be capable of doing even more work and a greater variety of work at the home site. Supervise and support these students in raising modest funds for supplies in order to enhance their contribution to the creation of defensible space for the home owner.

References

EXIT TICKET – FINAL REFLECTION

Name: _____________________________________________ Date: ______________

Now, what do you know about the traditional use of fire? What have you learned about the importance of fire to the ecosystem? What do you know about how fire behaves? What skills do you have for helping people and fire coexist in a fire-dependent ecosystem? You have 30-45 minutes to write as much as you know right now. Use the front, and back or this sheet or your own field notebook. Go!
TAKE STEPS TO PROTECT YOUR HOME FROM FIRE

- Maintain a screen constructed of nonflammable material over the flue opening of every chimney or stovepipe; officials recommend a screen mesh opening of 1/2".
- Replace 1/4" vent screens with 1/8" metal screens in roof, gable and subfloor vents to prevent embers from going into or under your house.
- Replace wood shakes/shingles with asphalt composition shingles (Class A) or metal roofing.
- Clear rain gutters and roof of leaves and pine needles.
- Build fences with nonflammable materials; and cover open ground with gravel, rock, brick, paving or other nonflammable substances.
- Move woodpiles away from your home.
- Install nonflammable or fire-resistant window coverings inside the house.
- Make your address visible from the road so firefighters can easily find it in an emergency.
- Install screening under deck areas to prevent accumulations of leaves and pine needles.
- Install wood smoke detectors in the fireplace or wood stove and outside sleeping areas.
- Replace window glass with dual-pane windows.
- Remove portions of any tree extending within 10 feet of the flue opening of any stove or chimney.
- Paint home exteriors with fire-retardant paints.
- Instead of repainting, install non-combustible home siding and non-combustible wainscoting.
- Annuals and seasonal perennials are better choices for landscaping near your home than flammable plants such as junipers.
Thanks to the hard work of the Confederated Salish and Kootenai Tribal (CSKT) firefighters in cooperation with the state’s Department of Natural Resources and Conservation (DNRC), Wild Horse Island, a Montana state park located on Flathead Lake, is receiving much needed wildfire fuel reduction treatments. These treatments, which are taking place in pine stands on the south lake shores, are providing relief for state owned land as well as a dozen privately owned properties.