Fire Feelings

N°. 51

JUNIOR

Science | Fine Arts

LESSON SUMMARY

Students will learn about the positive and negative effects of wildfires and fire ecology.

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Activity Information

Grade Level: Junior

Estimated Duration: Three class periods
(2 for classwork and research, 1 for presentation)

Setting: Indoors

Key Vocabulary: Wildland fire, succession, ecosystem, suppression, prescribed burn

Curriculum Links

Grade 4: Science, Habitats and Communities

B1.1 Assess positive and negative impacts of human activities on habitats and communities, while taking different perspectives into account.

Grade 5: Arts

B1.1 Engage actively in drama exploration and role play, with a focus on identifying and examining a range of issues, themes and ideas from a variety of fiction and non-fiction sources and diverse communities, times and places.

Grade 6: Science, Biodiversity

B2.5 Describe interrelationships within species, between species, and between species and their natural environment, and explain how these interrelationships sustain biodiversity.

Grade 6: Arts

B1.1 Engage actively in drama exploration and role play, with a focus identifying and examining a range of issues, themes and ideas from a variety of fiction and non-fiction sources and diverse communities, times and places.

Contributors: Aviation, Forest Fires and Emergency Services, Government of Ontario

Educator Background

Fire has always played a significant role in many ecosystems found across North America. Previously, management agencies labeled all fires as bad or detrimental to the health of wildlands. For this reason, efforts in the past by land managers concentrated on suppressing all fires. Over time, land management agencies have come to see fire as an important part of an ecosystem's natural cycle.

Today, some wildland fires are allowed to burn, and some fires are even ignited by trained fire specialists. Wildland fire management agencies across Canada have realized the benefits of allowing fire on the landscape and are making appropriate changes to policies and wildland fire management strategies.

Fires which are intentionally started are called prescribed burns or prescribed fires. Fires started by other forces, such as lightning, which are allowed to continue to burn are referred to as observed fires. Generally, these prescribed or observed fires are beneficial for the environment or otherwise. For example, they may renew caribou habitat, or create an area of cleared vegetation (known as a fire break) around a community where a larger fire cannot spread. Before a fire is set, wildfire managers assess the weather conditions to determine the potential of the fire growing too large/intense and escaping management control. Many conditions can affect the size and intensity of a fire. The speed and direction of winds, the moisture of both the soil and fuels which can feed the fire, as well as the slope of the land, are a few factors that influence fire behaviour. These factors are weighed carefully before decisions are made about whether to ignite a fire or to allow an already burning fire to continue.

Wildland fires can occur in and influence nearly all terrestrial ecosystems in North America. Fires can aid in plant succession, which refers to the orderly, gradual, and continuous replacement of one plant or animal community by another. In forests, fires help diminish the threats of insect outbreaks and disease. By burning infected, dead, or dying trees that harbor unwanted pests, fire reduces the likelihood that insect and/or disease related problems will occur. Some species of plant, such as the Jack Pine, even rely on high temperatures, such as those generated by fire, to release their seeds. Without fire, mature Jack Pines would release fewer seeds. Additionally, previously burned standing and fallen logs provide food and shelter for animals such as millipedes, termites, ants, and some bird species.

Setting or allowing existing fires (observed fires) to burn also reduces fuel loads, such as standing or fallen tree limbs, leaves, needles, shrubs, grasses, and living trees and shrubs. Periodic burning reduces the intensity of each fire that occurs in subsequent years, decreasing the impact of fire on fire-tolerant plants and animals. When fires are allowed to burn, nutrients are released into the soil that would otherwise be held in leaf litter and undergrowth. Once nutrients are released, grasses and other plants often spring to life and cover the ground. Underground plant structures, such as roots, rhizomes, and bulbs, can be stimulated to sprout if the fire does not burn extremely hot. Fires help provide large herbivores, such as deer and moose, with enhanced quantity and quality of shrubs and herbaceous/non-woody plants (wildflowers, grasses, etc). The nutrients that are released after a fire provide the lush, green growth that is preferred by many grazing animals. Some bird species, such as the Kirtland's Warbler, favour young Jack Pine for nesting. Larger trees that die after wildland fires can also provide nesting cavities for birds, such as the woodpecker and bluebird.

As fire burns across an area, not everything is impacted. Wildland fires create a mosaic pattern, often leaving some parts of the burned area untouched. Inside the fire perimeter, some areas can be completely burned, while others are mildly impacted or completely untouched. This mosaic pattern provides for a diversity of vegetative regrowth and animals. This biodiversity (diversity of living organisms) is an important factor in overall ecosystem health.

However, fires can also be a threat to humans. Fires that are not under control can destroy homes and other structures, and cause injury to people in the area. Human communities are vulnerable to fires when urban areas and rural communities live adjacent to or within wildlands. This is called the Wildland Urban Interface. This expansion of communities creates a unique crossing point between human communities and wildlands which contain large amounts of plant landscaping, fuel sources, and structures that can sustain a fire. Another impact of wildland fires is that they can burn timber that would have been harvested for lumber or paper products thereby impacting the livelihood of people dependent on the forest industry in the area.

This is why wildland fire management and related decision making is so complex. The interaction of ecological, social, and economic factors in a given area are evaluated for each fire. Decision makers must balance the potential ecological benefits of a fire with their top priority of safeguarding communities, infrastructure, and forest resources.

Activity

1. Begin by presenting the background information to the class. Discuss why some people view wildland fire as a positive force and why others view it as a negative force.
2. Divide the class into groups. Each group will select or be assigned a character to roleplay:
   - Park or forest manager: Ms. Oak
   - Owner of a home adjacent to a fire area: Mr. Shingle
   - Deer, moose, or other grazing animal: Sir Deer
   - Timber company: Mrs. Paper
   - Termites, millipedes, and other creatures that live and eat dead wood: Mr. and Mrs. Leggs
   - Other characters as suggested by students.
3. Have students conduct library research to uncover as much about wildland fires and prescribed burns as they can as it related to their assigned character. As a starting point, students can use the articles provided at the end of this lesson under **Resources**.
4. After adequate time for research, have each group prepare a class presentation by answering these statements for their character:
   - How would you feel about wildland fire in your area?
   - Would you feel differently if a fire is caused by lightning or humans, or feel the same about both?
   - List your positive and negative feelings about fire.
5. Have each group present their material to the rest of the class. They may do this in a skit form, an interview format, or in another presentation method of their choice.
6. Following the presentations and as a large group, discuss the commonalities and differences expressed. Address how a better understanding of fire management may influence some people's opinions about fire.

Extension

- In small groups, or as individuals, have students design a poster to support the opinion of one of the listed roles.
- In their roleplay teams, have each group write a letter to another team explaining why they should look at wildland fire and the impacts of wildland fire from different perspective.

Resources

Educators should provide the following links as a starting point for students to begin researching the topic. This is a good opportunity to teach what is required for accurate information gathering.

1. **Government of Ontario**
   The government of Ontario provides information and links to other resources that relate to wildland fires. You can find the current Ontario Wildland Fire management strategy, and other resources below: https://www.ontario.ca/page/forest-wildland-and-outdoor-fires

2. **Government of Canada**
   The government of Canada collects and provides information about wildland fires through their Natural Resources Canada website: https://www.nrcan.gc.ca/our-natural-resources/forests/wildland-fires-insects-disturbances/forest-fires/13143

3. **Canadian Interagency Forest Fire Centre (CIFFC)**
   CIFFC provides data of past wildland fire seasons and links to a wide variety of publications and other wildland fire science articles: https://www.ciffc.ca/

Evaluation

The focus of this assignment is the gathering of data and information. As such, the following marking rubric was created for small groups of students and focuses mainly on the level to which the information was researched, its accuracy, and detail.

	4	3	2	1
Framework	Information is presented in a highly logical and understandable way.	Information is presented in a logical and understandable way.	Information is presented with some confusion or lacking clarity.	Information is not presented in a logical or understandable way.
Accuracy	The information given is well articulated and highly accurate. Examples are given to contextualize each piece of information and support student understanding.	The information given is articulate and accurate. Some examples are given to contextualize each piece of information and support student understanding.	Some information given is articulate and accurate. A few examples are given to contextualize and support information.	Little to no information is articulate and accurate. Little to no examples are given to contextualize information.
Detail	Gives a highly detailed stance on forest fires as they relate to the assigned character, using relevant terminology.	Gives a detailed stance on forest fires as they relate to the assigned character, using relevant terminology.	Gives a somewhat detailed stance on forest fires as they relate to the assigned character, using some relevant terminology.	Does not give any detail on the assigned character's stance on forest fires, using little to no relevant terminology.
Comparison	Clear and thorough comparison of the positive and negative effects and perceptions of fires in Canadian forests.	Clear comparison of the positive and negative effects and perceptions of fires in Canadian forests.	Some attempts to compare the positive and negative effects and perceptions of fires in Canadian forests.	Unable to compare the positive and negative effects and perceptions of fires in Canadian forests.