



Outdoor School at Home

Calapooia Watershed Council

Title: Fire Ecology

Grade: 6

Duration: 45 minutes

Location: Home/Backyard/Park

Materials:

- Visuals
- Story
- 12 Clues
- Paper
- Markers
- Grass
- Twigs
- Sticks
- Branches
- Logs
- Colored Pencils
- Pencils

Lesson Preparation:

- Print out or have the Red Huckleberry Story available to read on a computer/tablet
- Print and cut out clues. Hide them in the area of the lesson.
- Collect grass, different sized sticks/branches, logs (if available) for lesson use
 - If these are not available please print and cut out the fuel images
- Make sure that paper and writing materials are available for the students

Objectives: Students will

- Identify the pros and cons of wildfires by sharing their knowledge of fire and discussing the messages in a short story about fire.
- Define the three methods of heat transfer in a wildfire by presenting clues they found in the forest in small groups.
- Categorize natural fuels based on the amount of heat energy required for combustion by arranging fuel examples in small groups.
- Predict what a fire would look like at different habitats and its effects by recording or sketching their ideas in their field journals.



<p>Introduction (10 minutes)</p>	<p>Hook: Share with students you found this story in the woods. And you wanted to read it to them. Read the tale of the two red huckleberries.</p> <ul style="list-style-type: none"> ● Ask students what they thought the lesson of the story was ● Discuss pros, cons, and importance of fire in the Willamette Valley ● Share that fire is a management tool used today and in the past
<p>Body (30 minutes)</p>	<ul style="list-style-type: none"> ● Share with students that this story left you with more questions about fire and ask for their help <ul style="list-style-type: none"> ○ Display questions on a white board or sheet of paper ● <u>First question:</u> Ask students what is needed to start a fire? <ul style="list-style-type: none"> ○ Show a visual of a triangle with blank spaces at each corner ○ Heat, Oxygen, and Fuel ○ Have students sketch the fire triangle in their journal ● <u>Second question:</u> How does fire work? How does it travel? <ul style="list-style-type: none"> ○ Have students share their own ideas ○ Share with students that clues have been hidden that can reveal this answer <ul style="list-style-type: none"> ■ Before students search for hidden clues, set designated boundaries ■ Set Up clues before the lesson begins and that every student can access the hidden clues ○ Once all of the clues have been collected share with students that clues must be matched up <ul style="list-style-type: none"> ■ There are 3 types of ways heat travels in a forest fire ■ Each type has a name, definition, and 2 pictures ○ After the clues have been matched, have the student share what they discovered or journal the answer they came up with ○ By the end, all groups should know the four methods of heat transfer in a forest fire: radiation, convection, and conduction ○ Optional: give each heat transfer mechanism a body movement to help students remember ● With this knowledge have each group categorize provided fuels in order from lowest energy needed to burn to highest <ul style="list-style-type: none"> ○ Fuels can include: grass, leaves, sticks, branches, logs ○ Visit each group and ask about their thought process <ul style="list-style-type: none"> ■ Grass - fast to heat and ignite, short burning period ■ Tree - slowest to heat and ignite (needs a high amount of heat to combust - very dense), long burning period ■ After the sorting, share the correct answers ● <u>Third question:</u> What would a fire look like in different habitats?



	<ul style="list-style-type: none"> ○ Pass out habitat pictures to students ○ Each student will sketch or write in their journal what they predict a fire would look like in each provided habitat ○ Once finished, have a few students share their journal entries ○ Ask students what they think it might look like after a fire? What would some of the pros/cons of a fire be?
<p>Closing (5 minutes)</p>	<ul style="list-style-type: none"> ● Thank students for helping you answer your questions ● Have students share one thing they would tell a friend about fires

Modifications:

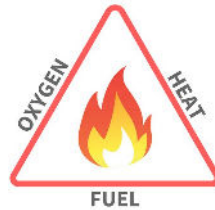
- Inclément Weather: This lesson can be moved indoors. Pass out forest visuals for students to determine what a fire would look like.
- Mobility: Set up this station in an area that is fairly leveled or easily accessible. Make sure some of the clues are easy to reach.
- ELL: Provide Spanish translation for the fire triangle, clues, and other visuals. If students know the fire triangle in Spanish, have them share.

Background Information:

The Kalapuyans originally occupied over a million acres in the Willamette and the Umpqua valleys. They have lived here for over 14,000 years and have endured enormous changes to their traditional life-ways during the past 200 years. The Kalapuyan peoples created the amazing fecundity of the Willamette Valley by practicing a form of land management or horticulture where they annually set fire to the valley, and in so doing cleared the land of excess vegetation, renewed food plants, and deposited nutrients in the soil, as well as other benefits. They were a stable society who harvested fruits and vegetables of the valley, and hunted and fished the terrestrial and aquatic animals to provide their primary food sources. The land along the Santiam River was inhabited and managed by the Santiam. Kalapuyans are still here today as part of the Confederated Tribes of Grand Ronde and the Confederated Tribes of the Siletz. (<https://ndnhistoryresearch.com/tribal-regions/kalapuyan-ethnohistory/>)

The Willamette Valley forests dominated by Douglas-Fir used to burn every 100 to 450 years. During the time of fire suppression, these fires were prevented. This caused the forest to become more dense and overgrown. Overgrown forests have much more fuel to burn which now increases the risk of high severity fires. Currently, the Willamette valley is at low to moderate risk for uncharacteristically severe fires. The dryer forests on eastern and southwestern Oregon are at much more risk for these high severity fires. Today, forest managers are working to decrease this risk by thinning forests, conducting prescribed burns and other mechanical treatments.

Fire Triangle: Oxygen, Heat, Fuel (without all 3, a fire cannot exist)



Radiation: heat or light that is transmitted in electromagnetic waves (solar, thermal)

Examples: Sun drying forest floor fuels, grasses, fire drying nearby fuel and materials

Conduction: the transfer of heat between solids, heat energy will move from hot to cold objects.

Convection: the transfer of heat through a liquid or gas

Examples: Rising hot air from a fire drying higher up leaves and branches, Smoke