

Watch Out for Fire

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Subject:	Fire science and the environment
Level:	First- fifth grade
Lesson Title:	Watch out for the fire
Lesson duration:	30-45 minutes; 15-20 min walk/hike and 15 mins for the game

Vocabulary:

- invasive
- native
- habitat
- fire resistant

Objectives:

- Learn what a native and invasive plant is.
- Learn how fires are good for the environment, but if the fire is in more of an urban environment the fire may need to be suppressed.

Method:

Students will go on a hike and learn about some common and native plants along with some invasive plants. Then students will participate in a role playing game that shows how fire can restore an environment.

Materials:

- Some sort of colored item to identify different roles: for example, stickers, wristbands, etc.
- cones/ boundary markers

Background:

What is **fire**? The exact definition is: the light and heat and especially the flame produced by burning. There are three main ingredients that needed to start a fire: oxygen, heat and fuel. Historically, fire was thought to be bad for a forest or oak savannah habitat. Fire is actually good for the environment! But if a fire gets out of hand and near homes it may be time to control the fire. Fire can start in many ways like, an oven overheating, lightning, or even cigarettes so it is important to not try to cause a fire unless it organized by scientists or fire officials. A time when a fire would be necessary would be if an area had been suppressed from fire for a long time, and park rangers or scientists feel like it would be a good idea to create a controlled fire in the area to eliminate the bad/harmful plants and bring back the good/useful plants. When a fire starts in a place like the oak savanna habitat, it will wipe away most of the invasive plants/ species, and bring out some new plants that are planted but cannot grow until

they are covered in heat. The seeds are for example in pine cones, and when a fire comes around most pine trees like the ponderosa pine, it will almost melt the 'glue' around the pine cone that holds the seeds inside, then when the fire stops water can be added to the seeds to grow new trees. Now what is a **fire regime**? This is one of the things that are good to know, even if it doesn't get addressed to the kids. A fire regime is the frequency, pattern and/or the intensity of a wildfire/bushfire in an area for a long amount of time.

For some background on fire in the oak savanna habitat, some trees including the Oregon white oak have become fire resistant and are able to adapt through the heat. Between the mid 1700's to the 1900s, the oaks savanna had only been through low intensity fires. Some scientists actually have prescribed fires that are planned and controlled to help the environment. That however is not 100% confirmed, but it is thought to be that way due to the unusual frequency of fires that burned. Some plants/trees that are fire resistant/ or need fire are the **ponderosa pine**. The ponderosa pine is a tree with very thick bark that can survive through low intensity fires, and has an extra layer of thin bark that can be burned if the fire gets too large. **White oaks** are also a tree that can live through a fire, the thick bark is fire resistant, and sometimes a white oak will grow from remnant of a fire. **Willows** are also meant to adapt and live through a fire due to the slender shape but thick trunks of the tree. Some shrubs that are fire resistant are like **wild strawberries**, **vine maple**, and or **mock strawberries** because of the oils and water in the leaves and the plant. The recovery process after a fire disturbance it is quick, slowly an ecosystem will recover by replacing the burned plants with new plants that had been seeded in the ground. The fire helps the seeds in the ground germinate and melt the "glue like" substance on some cones or on the see. Then once it rains, the plant can happily sprout. Another way ecosystems recover is when a tree burns down, if the tree is healthy it will release sprouts underground to grow a new tree after the fire stops.

Procedure:

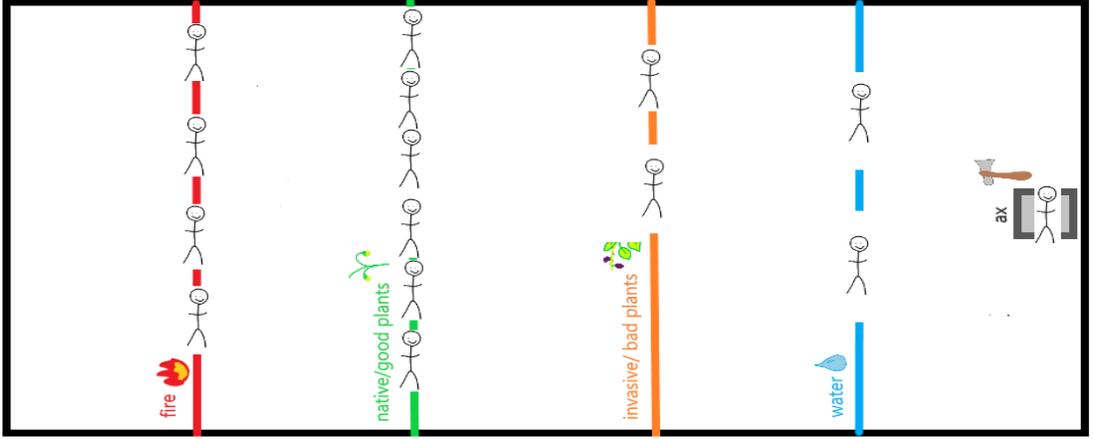
1. You will need to read this lesson plan, as well as use some sort of colored item (bracelets, stickers, etc.) to divide the kids into five color groups: red, blue, orange, grey, and green.
2. Take the children on a short hike and point out invasive and native plants. Native plants in Wilsonville would be the Oregon oak tree, ponderosa pine, and Oregon grape. Some invasive plants are blackberries and thistle.
3. Then stop at a resting point, and talk about interesting facts about the native and invasive plants.
4. While at the resting point, point out oak savannah open habitat and discuss how historically fires rolled through this land. In addition, discuss how the fire can help introduce new plants into the environment. Explain how fires help remove unwanted invasive plants since they are not resistant to fire.
5. Walk the kids back to the area where you're going to play the game with them.
6. Assign every kid with a color and a corresponding plant/water/fire/axe/fire resistant plant to their color so they know what they are. Below describes the roles of each color:
 - **RED GROUP:** Fire

- **GREEN GROUP:** Native Plants
 - **ORANGE GROUP:** Invasive plants
 - **BLUE GROUP:** Water
 - **GREY GROUP:** Axe
7. Use marker cones to make a boundary, along with 5 even spots on a line for the kids to line up.
 8. Ask for all the kids with red markers to line up in front of you. Tell them that they need to line up on the furthest side to the left (See diagram below). Then repeat the line up process with colors in order; green, orange, blue, grey, until you reach the 5th cone.
 9. Everyone needs to sit down. Tell the kids you will be narrating the game.
 10. Explain the rules for each color to students:
 - **RED GROUP:** Tell the fire/red group that they will stand up and tag anyone who has green on. Many native plants thrive on low intensity fires.
 - **GREEN GROUP:** Tell the green/plant group that their job is to stay seated until the fire tags them. Then after they grow they will need to wait for water to run by, the plants need to tag the water to keep growing. (this absorbs the water and the water has to sit back down)
 - **ORANGE GROUP:** Tell the orange/invasive plant group that their job is to help the plants absorb all of the water to keep growing.
 - **BLUE GROUP:** Tell the blue/water group that their job is to tag all of the fire without getting absorbed by the plants or invasive plants.
 - **THE AXE:** Tell the axe that they need to tag all of the invasive plants to cut them down, and control the environment.

Now that the rules are explained you can then tell the fire group that can stand up in their line and the green plants to stand up. Plants can't run fast though, so tell the kids to find a spot in the line to grow and stay planted. The fire is going to try to run past the green group without getting tagged. The green plants can only tag the fire with their arms and need to stay rooted in the ground. When it is time for the water to come through, the orange plants (invasive) can run to try and tag the water to absorb it, then continue to spread. Then when the axe comes along, it chops all of the orange plants leaving them to be cut down and/or controlled.
 11. Then the water/blue can stand up. The water has to run through the plants without getting tagged (the plants tag water to grow (plants absorb water like a sponge)) and reach the fire to put it out.
 12. When the fire is put out, some invasive plants start to grow (orange) and when the water goes back to their line the water needs to try to not get tagged of the invasive plants will suck the water more.
 13. Now the ax stands up and runs through to cut the invasive plants down. This makes it so that the environment has been restored.
 14. Now tell the kids what the point of the game was; to see how fire is good for the environment and how it can help the good plants grow and can combat invasive species.

Diagram: Shows how players are positioned on the field.

15'



30'