



Wildfire in Nevada Ecosystems

High School Biology Unit



Wildfire Activities -
Fuel Finders

Fuel Finders

In this activity, students will learn to differentiate between wet and dry fuels and learn how those differences contribute to fires with lower or higher intensity and severity.

Objectives

1. Students will understand the difference between wet and dry fuels
2. Students will understand fire behavior depending on fuel type and fuel density
3. Participants will learn to identify the difference between wet and dry fuels

Materials:

- Labeled bins or paper bags to sort fuels (x3)
- Examples of wet fuels and dry fuels to pass around (x1/student)
- Paper or journals (x1/student)
- Pencils and coloring supplies (x1/student)
- If burning:
 - Foil pans to place fuels in (x3)
 - Torch
 - Fire extinguisher
 - Safety glasses

Vocabulary

Fuel	Something that is combustible and allows a fire to burn
Fuel moisture	The amount of liquid a piece of fuel has in it. The more liquid is in the fuel, the less it will be likely to burn
Vaporize	For all of the moisture to evaporate from an object

Introduction

Today we are going to be talking about wildfire and the difference in the way a fire burns when there's a lot of water in the things that are burning and when there is not a lot of water in those things. Fire can be a stressful

topic to talk about and think about. We will be burning things during this lesson. If you are uncomfortable or scared at any point during the lesson, tell one of the educators and we can help you.

Explain the concept of fuels to students. **Fuel** is something that is combustible and allows a fire to burn. This can be wood, leaves, paper, pine needles, etc. What are some other things you would consider “fuel”?

Safety Instructions

This lesson involves lighting fuels on fire to demonstrate fire behavior in different settings. While this is great for student engagement, there are a few safety considerations. When these basic rules are followed, this activity is quite safe. However, these activities can be dangerous if rules are not followed. Please consider the maturity of your students and adjust the safety protocols as needed.

- Only have adults handle fire. Do not give students ways to independently start fires during this lesson.
- Students and instructors should tie back long hair or loose clothing.
- These activities can produce a short-lived flame up to 12 inches long. Burning should only be conducted outside in a place far from other flammable materials or in a lab hood.
- A lighter or torch with a long neck will help keep fingers away from the heat. Grill lighters work well, but a basic butane torch is the most effective.

Activity Instructions

1. (5 min) Ask students: How can having more wet fuels versus more dry fuels affect the way a fire burns?
 - a. Discuss the differences between wet fuels and dry fuels.
 - b. When a fire comes through an area and the vegetation is too wet to burn, the water in the fuels must vaporize before they can catch fire. That means a fire has to be super-hot or stay in the same place for a long time for these **wet fuels** to burn.
2. (5 min) Teach students how to identify wet versus dry fuels (wet fuels will bend more easily, while dry fuels will snap or crackle).
 - a. Do this by passing around the example pieces of fuel. Emphasize that the ones used as examples are not the only things considered fuel. While it is most often vegetation that we consider fuel, human-made objects can also be fuel, depending on their flammability. Wet fuels may be misinterpreted as dripping wet, but explain that wet fuels also include things that are more green than brown, are squishier or firm than crunchy, etc.
 - b. Make this piece a sensory activity using sound and touch. Show students that by holding samples of fuel up to their ears and squishing it, they might have an easier time identifying which one is which.
3. (25 min) Tell students that we are going to go on a scavenger hunt to find two samples of each type of fuel.
 - a. (5 min) explain the assignment
 - b. (20 min) Explore the area and find fuel samples with adult supervision.
4. (15 min) As students come back from finding their fuels, instruct them to hold on to them. Pass out pieces of paper or have them collect their journals. Students will then journal about their fuels for a few minutes.
 - a. Journal prompt: Now we are going to sit down and observe the things we found. Some of you may want to draw the things you found while others may want to write about the fuels themselves or even how you feel about them! Do what feels right to you during the next fifteen minutes.
 - b. When students are finished journaling, have them sort their fuels into bins labeled wet and dry.
5. (5 mins) Educators will go through the bins to show the class what was correctly sorted and what was not. You may want to have a third bin for items that are harder to classify. Explain that most landscapes will have a mix of wet and dry fuels.
 - a. Examples of mostly wet environments, like those in the Pacific Northwest, will hardly ever burn. They have a hard time catching on fire because the whole ecosystem has a high moisture content.
 - b. Examples of dry environments, like the deserts we live in, will catch on fire much more easily because they don't have enough water to keep the fire away.
6. OPTIONAL (10 mins) Put sorted fuels into foil pans and burn them to show the difference between how they burn. Make sure to talk about safety rules before burning and demonstrate good safety practices.