



Colorado Wildfire - Teacher Guide

Setting the Stage

In recent decades, wildfires are occurring more frequently in the western United States. These wildfires are also increasing in size, leading to a phenomenon called megafires. While people cannot predict when or where the next big fire will occur, forecasters can use climate and forest composition data to assess risk levels. Time and time again, we see lives lost and property damaged due to wildfire, even though the risks and impacts of wildfire are well known.



The Black Forest Fire burning east of Colorado Springs, 2013. Photo Credit: U.S. Air Force Photo/Carol Lawrence

Lesson Overview

Students will build understanding of wildfires in Colorado through the following activities:

- *Part 1 – Engage (20 minutes) Introduction to Fire Science & Case Study*
As a class, watch news clips about wildfires in Colorado and have a brief class discussion.
- *Part 2 – Explore (60 minutes) Wildfire Data Analysis Jigsaw*
In groups, analyze wildfire information resources and data to build understanding of the causes, impacts, locations, and frequency of wildfires. Additionally, students use GIS to identify areas in their community in the wildland urban interface that may be at risk of wildfire.
- *Part 3 – Explain and Evaluate (90 minutes) Community Outreach for Wildfire Preparation*
New student groups (with a student from each group in Part 2 jigsaw group) will present information to each other, and begin writing an outline for a Letter to the Editor. Next, students write a Letter to the Editor answering the driving question: What can we learn from past wildfires to prepare for future wildfires?

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Instructional Overview	
Grade Level	High School
Instructional Time	170 minutes
Unit Driving Question	How can we make our community more resilient to wildfire?
Lesson Driving Question	What can we learn from past wildfires to prepare for future wildfires?
Building Toward	NGSS: HS-ESS3-1 CDE: HS3.ESS.GLE10
Three Dimensions	<p>Science and Engineering Practices:</p> <ul style="list-style-type: none">● Analyzing and Interpreting Data● Obtaining, Evaluating, and Communicating Information <p>Disciplinary Core Ideas:</p> <ul style="list-style-type: none">● ESS3.B: Natural Hazards <p>Crosscutting Concepts:</p> <ul style="list-style-type: none">● Patterns● Cause and effect
What Students Will Do	<ul style="list-style-type: none">● Analyze wildfire data to identify patterns of wildfire history and risk in Colorado.● Communicate information about the causes and effects of wildfires in your community. Explain what community members should do to be safe in the event of a wildfire.
Materials	<ul style="list-style-type: none"><input type="checkbox"/> Wildfire Student Worksheet<input type="checkbox"/> Lesson Slides
Material Preparation	<ul style="list-style-type: none"><input type="checkbox"/> Computer and internet access are essential for this lesson. Ideally each student will have access to a computer or tablet.<input type="checkbox"/> Post the Wildfire Student Worksheet to the class website. Students will need digital access to the worksheets to access the links for each activity.<input type="checkbox"/> Print copies of the Letter to the Editor Outline (pages 8-11 of the Wildfire Student Worksheet) for each student.<input type="checkbox"/> Optional: Download your Local Hazard Mitigation Plan from here: https://www.colorado.gov/pacific/mars/approved-plans Find the sections that students will need (the Wildfire Past Events section within the Risk Assessment section). Write down the page numbers so students can easily find the sections they need. <i>*Note: Though there are a general set of guidelines for local hazard mitigation plans, not all plans are organized the same way. We recommend spending some time exploring the document before teaching the lesson to avoid confusion.</i>



<p>Vocabulary</p>	<p><u>Natural hazards</u> are naturally occurring phenomena such as flood, wildfire, extreme heat, or drought, which may disrupt or damage a community.</p> <p><u>Wildfires</u> are defined as an unplanned, unwanted wildland fire including unauthorized human caused fires, escaped wildland fire use events, escaped prescribed fire projects, and all other wildland fires where the objective is to put the fire out. .</p> <p><u>Fuel load</u> is the total amount of combustible (burnable) material in a defined space.</p> <p><u>Ignition</u> is the starting of a fire.</p> <p><u>Anthropogenic</u> means the influence of human beings on nature.</p> <p><u>WUI</u> is an acronym for the Wildland-Urban Interface, the area where forests and human development overlap.</p> <p><u>Firewise</u> is a term used to describe the state of being knowledgeable and prepared for wildfire in residential or urban settings.</p> <p><u>Emissions</u> are products, such as gases, that are released into the atmosphere (e.g., smoke from a fire).</p>
<p>Instructional Strategies</p>	<ul style="list-style-type: none"> ● Jigsaw: A cooperative learning strategy in which each group is responsible for learning one “piece of the puzzle” and then sharing that information with other groups to complete the whole picture. Use Part 3 for students to present the information they learned at their stations. Teachers can choose to use this strategy if time is limited, and stations can be differentiated for different student abilities and levels of teacher assistance.
<p>Opportunities for Bringing Experts into the Classroom</p>	<ul style="list-style-type: none"> ● Part 1: Kick off the lesson with a city or county emergency manager speaking about wildfire risk and emergency response plans.

Part 1 (Engage) Introduction to Fire Science & Case Study (20 minutes)

Why is it important to study wildfires?

Begin the lesson with a warm-up KWL Chart (Know, Want to Know, Learned) on the first page of the [student worksheet](#). Use Think, Pair, Share for students to share out what they already know and what they want to learn.

Use the news stories [Evacuating the Waldo Canyon Fire \(3:40\)](#) and [The Waldo Canyon fire, five years later: Colorado Springs rebuilds \(1:15\)](#) to get students thinking about wildfires. As a class, briefly discuss observations and questions about wildfires. Write down a list of questions to refer back to throughout the unit.



Next, watch the [Wildfires in Colorado with Megan Cattau](#), a wildfire expert and postdoctoral researcher with the Earth Lab at the University of Colorado Boulder. **STOP** the video at minute 3:36.





Part 2 (Explore) Wildfire Data Analysis Jigsaw (60 minutes)

Part 2 is designed as a jigsaw in which students work in five small groups to investigate a question and then share out with their classmates. Post pages 2-7 of the [student worksheet](#) on the class website so students have online access to the instructions, which contain links to resources.

Note that there is a sixth activity for all groups to complete, that has students identify areas in their community that are at risk of wildfires.

Give groups 60 minutes to do their research and create their slides. Alternatively, if class time allows, have all students complete all investigations.

Part 3 (Explain) Community Outreach for Wildfire Awareness (90 minutes)

What can we learn from past wildfires to prepare for future wildfires?

For Part 3, students will work in new groups, or wildfire planning teams. Each wildfire planning team is made up of one student from each of the jigsaw groups, so that the team consists of students that collectively completed each of the Part 2 investigations. The goal is to have an expert from each station in order to communicate key wildfire information to your community that faces wildfire risk in the form of a Letter to the Editor in the local newspaper.

Wildfire Expert Interview (5 min)

Begin by watching the rest of the Megan Cattau Wildfires in Colorado video as a class.

[Wildfires in Colorado with Megan Cattau, PhD](#)

BEGIN @ 3:36



Letter to the Editor (85 min)

Divide the class into the wildfire planning teams. Ask students to use the Letter to the Editor Outline on pages 8-11 of their [student worksheet](#). Give students thirty minutes to share their slides from their investigations (5 minutes each). As each team member shares their learning, the other team members should be taking notes in their outline for their letter to the editor.

After students have finished sharing out in groups, have students write a letter to the editor using their outline as a guide. These letters can be collected as a summative assessment for the lesson.

When students have completed the assignment, post the letters on the class website for others to read and give feedback. Consider sending in the best letters to the local newspaper.



Finish the lesson by returning to the KWL Chart on page 1 of the [student worksheet](#), and have students complete the “What I Learned” section.

Find more HEART Force Curriculum here:

<https://cires.colorado.edu/outreach/projects/HEARTForce>