

# Earth Day Lesson Plan for Climate Change Adaptation

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## Introduction & Background

Climate change adaptation is a concept that, as defined by Yale Climate Connections, requires "communities to work to adapt to the consequence of rising temperatures" (2019). The idea of climate change adaptation is important as reducing carbon emissions is no longer enough to halt the impact of climate change (UNEP, 2020). It is not how we can revert what we have done but now how we can adapt to the effects that come with climate change.

California is the leading state in the United States to contribute to the growing number of wildfires. In fact, per the California Department of Forestry and Fire Protection, the state has burned more than 4.13 million acres in 2020. More than 9,200 structures have been damaged or destroyed and 31 people have died (EO, 2020).

The main cause of wildfires in the golden state is the burning of fossil fuels (ARB, 2020). It is increasing the frequency and severity of wildfires in California. Areas burned by California wildfires are increasing rapidly each year with spring and summer temperatures warming, and spring snow melting earlier than expected.

Maintaining the environment and keeping it healthy is the current goal. Additionally, exercising techniques for wildfire prevention. 2020 will not be the only year where wildfires will rage. In 2021, California's rainy season has already shrunk which poses as a threat to the upcoming wildfire season.

The growing concerns for the upcoming wildfire season provide a way to intersect them into an educational lesson plan that will educate students about the sustainability concept of adaptation by using California wildfires as a case study.

## Methods

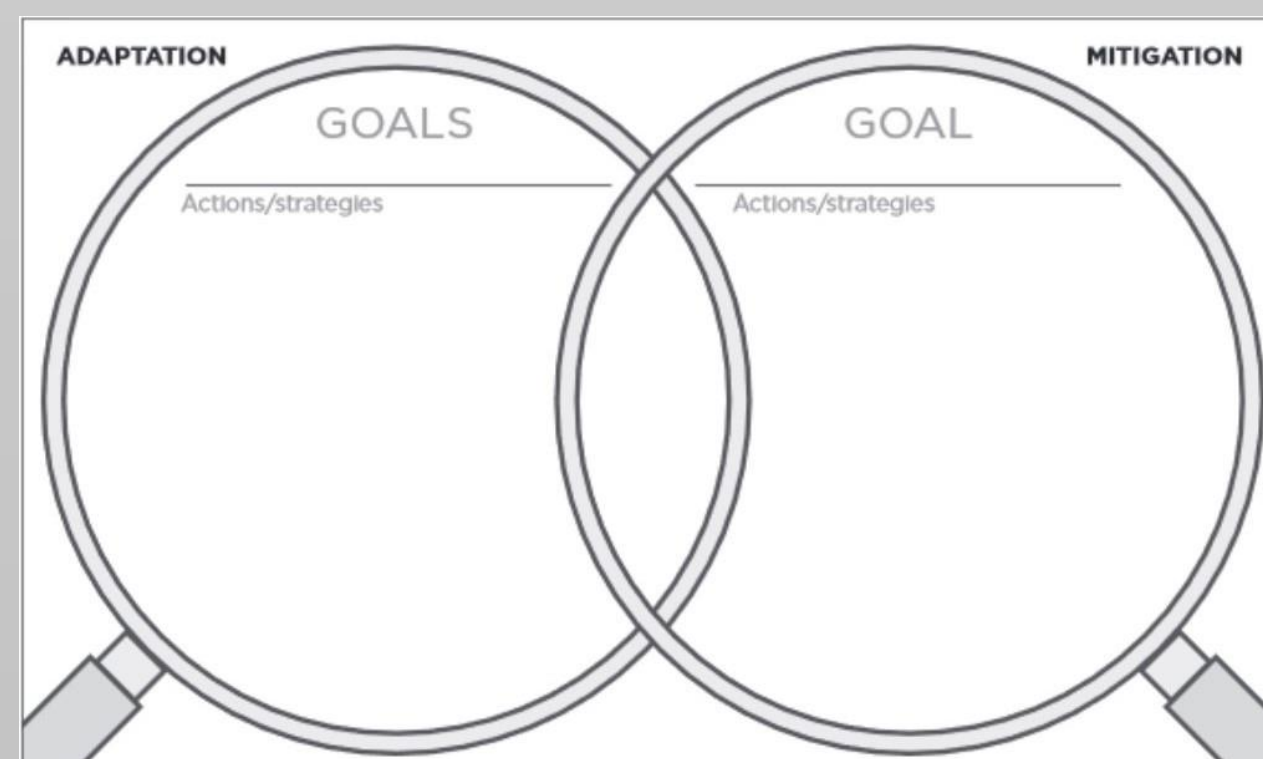
When designing the lesson plan, I focused on a hands-on approach for the students.

While there were multiple resources widely available on the internet, I chose to use Nature Lab Resources, Ingenium, and Zinn Education project. Each had a model that I could use as reference and implement into the overall final design of the plan.

With the vocabulary provided by Nature Lab Resources I will be able to educate the students on what adaptation is (as well as behavioral and structural adaptation), the difference between wildfires and controlled burns, as well as keystone species within the state of California.

Additionally, using the Zinn Education Project's free accessible activity will be able to ensure that all students are working together within the classroom. It also helps them learn and understand that climate change is not only a local issue, but a global issue contributed by several other factors, including countries and companies.

I also enlisted using the Venn Diagram method (Figure 1) that Ingenium mentioned in their own version of a Climate Change Adaptation lesson.



**Figure 1.** A Venn Diagram that will have students work together to sort out adaptation and mitigation goals.

## Results

At the end of this lesson, students should know and be able to ...

- explain why it is important to adapt to fires.
- care for seedlings to survive.
- clear fuel sources from forest floor

Environmental educators suggest that lessons are most effective when they are hands-on. While ensuring that Next Generation Science Standards are met and offering opportunities in class for students to connect their experiences to scientific principles, I have developed a lesson plan that centers around teaching adaptability and preparation for the upcoming wildfire season.

To ensure that the students understand the concept of global warming and climate change, I will enlist the help of Zinc Education Project's activity that puts the classroom into groups ("the market", the U.S. Government, U.S. consumers, the Governments of China and India, and Oil and Coal Companies) and act out a trial where each group has been charged with causing the climate crisis.

Next, using Nature Lab Resources, we will discuss a variety of vocabulary and definitions associated with the words. By instilling these words into the students, it will help them be aware in a situation where fire poses as a threat.

Words that will be discussed are:

- Adaptation
- Behavioral adaptation
- Controlled burn
- Climate change
- Keystone species
- Structural adaptation

While also using other resources from Nature Lab, we will feature a before and after photo gallery of forest fires that have devastated California lands. Open discussion will be optional at this time in case if any of the students wishes to share any thoughts, opinions, or experiences.



**Figure 2.** A photo of a before and after of Lake Oroville in 2020. This is an example apart of the photo gallery the students will be previewing.

After the photo gallery has been viewed by the students, we will then break out into groups where we will fill out a Venn Diagram sheet as seen in Figure 1. This sheet will be used to identify goals (actions/strategies) for each section and then whatever that may or may not overlap in the middle. If time allows students will rotate through group tables and discuss what their classmates have wrote.

Finally, before the students leave an informative flyer will be passed to them to take home (Figure 3).

**Figure 3.** The 6 Ps of Evacuation. This flyer is important for students to have as it educates them and their family on how to prepare for a wildfire.

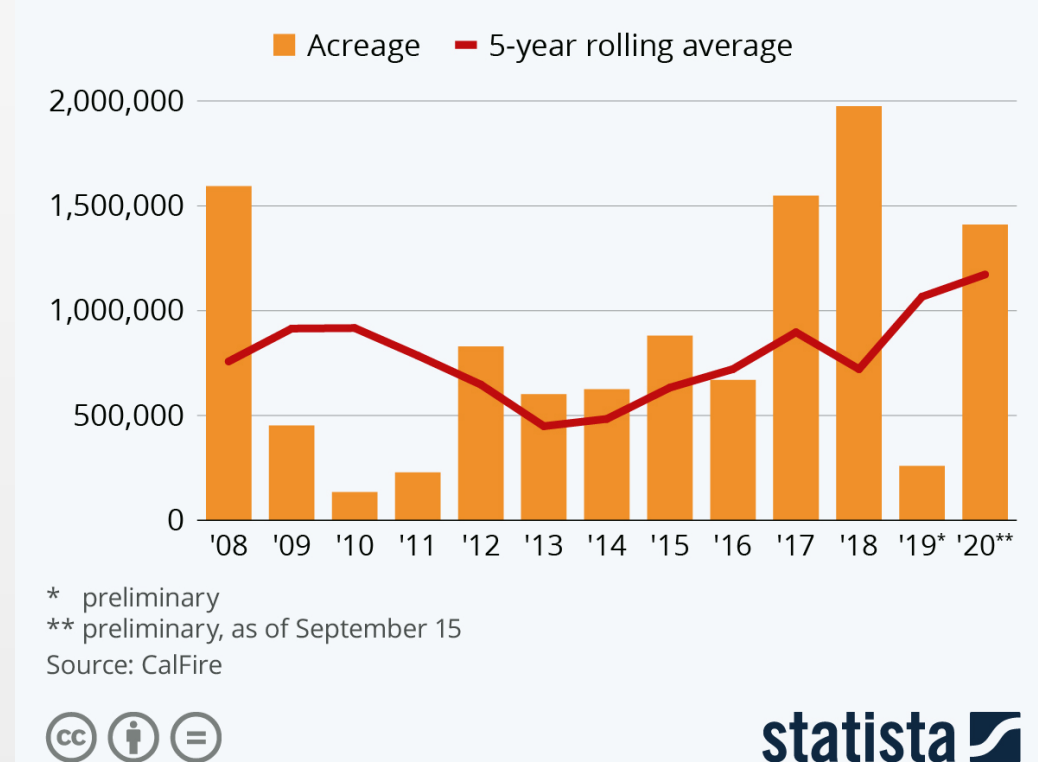


## Discussion

The learning outcomes I have laid out for the students go hand in hand with the lesson plan. Each part of the lesson is key in educating and informing students on climate change and the outcomes (such as the growing wildfires) that follows when an environment is damaged.

### The Growing Danger of Californian Wildfires

Number of acres burned by wildfires in California 2008-2020



**Figure 4.** Statista reveals the increasing average of wildfires in the golden state.

Allowing them to act out a trial on climate change ensures that they know they know there are multiple contributing factors when it comes to the damaging effects on the environment. It is up to us to hold these governments and companies accountable.

Meanwhile, showing students a graph of the increase in wildfires (Figure 4) help them recognize the concerning trends in the rise of wildfires in the State of California. To really enforce the severity the use of before and after photos of affected wildfires enable the students to see the absolute devastation of the aftermath (Figure 2). Opening the discussion to the students will encourage them to share their thoughts, ideas, and perhaps their own personal experiences with wildfires.

With the use of the Venn Diagram work sheet (Figure 1) the students will be able to form ideas together how to mitigate and adapt to the climate change in the golden state. Such as clearing dead trees and allowing the survival of seedlings.

The handout flyer of the Six Ps of Evacuation (Figure 3) is crucial for students because not everyone has a plan. This tragic natural disaster has had a negative influence on those who were victims of wildfires and the essential goal of this lesson plan is to build a line of new leaders in this generations to come and to become more environmentally aware of how to act during any types of fire situations, even house fires.

## Conclusion

Teaching students about climate change adaptability, especially in California, is important in preparing the newer generation for the outcomes of climate change.

While we cannot fix what has already been damaged, with the right kind of knowledge, students (as well as the students' families) will be prepared to adapt, mitigate, and overcome wildfires in the future.

## For more information

Please contact [email@csulb.edu](mailto:email@csulb.edu). More information on this and related project can be obtained at [www.csulb.edu](http://www.csulb.edu)... A link to an online, PDF-version of the poster is nice, too.