

**Fire Frenzy
Wildland Fire
Education Program**

**National Park Service
U.S. Department of the Interior**

**Santa Monica Mountains
National Recreation Area**



Santa Monica Mountains National Recreation Area
Fire Frenzy Wildland Fire Education Program
Wildfires and Fire Ecology in Southern California





WELCOME

**WELCOME TO SANTA MONICA MOUNTAINS NATIONAL RECREATION AREA
WILDLAND FIRE EDUCATION PROGRAM**

Thank you for your dedication to sharing the phenomenon of wildfires with your students. The purpose of this guide is to familiarize you with the resources available for use with the Fire Frenzy Wildland Fire Education Program.

This quick guide includes each unit of the program along with:

- Goals
- Essential or Focus Question
- Objectives
- NGSS Standards
- Lesson Plan

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POWERPOINTS

POWERPOINTS

The PowerPoints on this drive cover a range of topics relating to wildland fires. They are geared toward a 7-12 th grade audience but you may edit them to fit your needs. The topics are broken into nine PowerPoints so you may choose which topics you want to explore. We recommend that you view them before showing students and familiarize yourself with the content. There are notes below many of the slides as well as links to online videos and content.

PowerPoints:

1. Mediterranean Biomes, Climate, & Ecosystems
2. Chaparral Plant Communities
3. Wildfires - Natural History
4. Wildland Fire - A Physical Process
5. Wildland Fire in the Santa Monica Mountains
6. Fire Ecology: The relationship between wildfires & the biotic & abiotic environment
7. Wildland Urban Interface: Learning to live with wildfires
8. Wildland Fire Careers
9. Wildfires and Our Home (Pre-visit for elementary & middle school students)

The following sections will break down each PowerPoint with details.

MEDITERRANEAN BIOMES, CLIMATE, & ECOSYSTEMS

GOAL

This unit will provide a basic understanding of Mediterranean biomes, ecosystems, and climates including where they are found, their characteristics, biodiversity within them, and human habitation.

ESSENTIAL QUESTION

What is a Mediterranean biome and why is it special and important?

OBJECTIVES

- After this lesson, 90% of students will be able to share what type and the importance of the biome they live within.
- After this lesson, 50% of students will be able to discuss the difference between a biome and an ecosystem and how climate is related to each.

NGSS STANDARDS

HS-LS2-1 Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.

HS-LS2-6 Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.

HS-LS2-7 Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

HS-LS4-5 Evaluate the evidence supporting claims that changes in environmental conditions may result in (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.

HS-ESS3-1 Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

HS-ESS3-3 Create a computational simulation to illustrate the relationships among the management of natural resources, the sustainability of human populations, and biodiversity.

POWERPOINTS

MEDITERRANEAN BIOMES, CLIMATE, & ECOSYSTEMS

STANDARDS

HS-ESS3-4. Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.

HS-ESS3-5. Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth's systems.

HS-ESS3-6. Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.

HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

HS-ETS1-2. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

HS-ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

HS-ETS1-4. Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.

LESSON PLAN

INTRODUCTION:

1. Explain: As a physical and important ecological process, fire plays a complex role in Southern California's Mediterranean ecosystem affecting the survival and preservation of the plants, animals, and humans within the ecosystem. By broadening our awareness and familiarity with local ecosystems and understanding why and how fires occur in Southern California, stakeholders can develop procedures to protect life and property, allow for future growth, and continue to preserve a valuable natural resource.
2. Ask the students what they already know about the ecosystem they live in and how they think it relates to wildfires.
3. Explain that your class will now start an exploration of one aspect of why we have wildfires in Southern California: the Mediterranean climate and ecosystem.

LEARNING ACTIVITY:

Display *Mediterranean Biomes, Climate, & Ecosystems* PowerPoint presentation.

Facilitate a dialogue about biomes, ecosystems, climate, and Mediterranean biomes using the notes in each slide of the PowerPoint as a reference if needed.

CHECK FOR UNDERSTANDING:

- What type of biome do you live in?
- How is an ecosystem different from a biome?
- What is an abiotic factor?
- What is a biotic factor?
- What is biodiversity?
- Why is the Mediterranean biome that we live in important?
- How do you think that the ecosystem that you live in is related to wildfires?

POWERPOINTS

CHAPARRAL PLANT COMMUNITIES

CHAPARRAL PLANT COMMUNITIES

GOAL

This unit will focus on plant communities in the Mediterranean ecosystem of Southern California and the Santa Monica Mountains primarily focusing on the most common habitat in California: chaparral. Chaparral locations, characteristics, plants, animals, adaptations, threats, and importance will all be addressed in this unit.

ESSENTIAL QUESTION

What is chaparral and why is it important?

OBJECTIVES

- During this lesson, 100% of students will participate in a discussion about chaparral and why it is important.
- After this lesson, 75% of students will be able to discuss ways in which chaparral plants adapt to their ecosystems for survival.
- After this lesson, 75% of students will be able to name two animals that live within the chaparral.
- After this lesson, 75% of students will be able to identify one reason chaparral is important and one threat to chaparral.

NGSS STANDARDS

HS-LS2-1. Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.

HS-LS2-2. Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.

HS-LS2-6. Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.

HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

HS-LS4-5. Evaluate the evidence supporting claims that changes in environmental conditions may result in (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species

HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

HS-ESS3-3. Create a computational simulation to illustrate the relationships among the management of natural resources, the sustainability of human populations, and biodiversity.

HS-ESS3-4. Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.

HS-ESS3-5. Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth's systems.

HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

HS-ETS1-2. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

POWERPOINTS

CHAPARRAL PLANT COMMUNITIES

STANDARDS

HS-ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

HS-ETS1-4. Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.

LESSON PLAN

INTRODUCTION:

1. Explain: As a physical and important ecological process, fire plays a complex role in Southern California's Mediterranean ecosystem affecting the survival and preservation of the plants, animals, and humans within the ecosystem. By broadening our awareness and familiarity with local ecosystems and understanding why and how fires occur in Southern California, stakeholders can develop procedures to protect life and property, allow for future growth, and continue to preserve a valuable natural resource.
2. Ask the students what they already know about Chaparral.
3. Ask students what they think Chaparral has to do with wildfires.
4. Explain that your class will now start an exploration of the most common plant community in California: Chaparral.

LEARNING ACTIVITY:

Display *Chaparral: Plant Communities* PowerPoint presentation. Facilitate a dialogue about Southern California plant communities focused on chaparral using the notes in each slide of the PowerPoint as a reference if needed.

CHECK FOR UNDERSTANDING:

- What is a plant community? Name one.
- What are the common characteristics of chaparral?
- Why is chaparral significant in California?
- How have chaparral plants adapted to survive in their environments?
- Name common animals that live in and depend on chaparral.
- Why is chaparral important?
- Name one threat to the chaparral.

ADDITIONAL LEARNING ACTIVITIES:

1. Read the 6-page handout (Included in the Teacher Resources): *The Chaparral Habitat: For Young Chaparralians*.
http://www.californiachaparral.com/images/CHAP_32_Learning_Chaparral_Habitat.pdf
2. Watch *California's Green Chaparral* episode with Huell Howser and Richard Halsey
<https://blogs.chapman.edu/huell-howser-archives/2005/09/29/chaparral-californias-green-121/>

POWERPOINTS

WILDFIRES - NATURAL HISTORY

WILDFIRES - NATURAL HISTORY

GOAL

This unit covers wildfire from a historic perspective: how fires were started and the believed historic fire interval before humans arrived in California as well as how fires were used after humans arrived in California.

ESSENTIAL QUESTION

Before people came to California, how often did fires occur and what were the conditions that caused wildfires? After humans arrived in California, did they use fire for their own needs?

OBJECTIVES

- After this lesson, 50% of students will be able to discuss one way fire is important to shrublands.
- After this lesson, 80% of students will be able to identify the greatest threat to plant communities if wildfires occur too often.
- During this lesson, 100% of students will take part in a discussion about how wildfires occurred naturally and how Native Americans and ranchers used fire for their needs and survival.

NGSS STANDARDS

HS-LS2-2. Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.

HS-LS2-6. Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.

HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

HS-LS4-5. Evaluate the evidence supporting claims that changes in environmental conditions may result in (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.

HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

HS-ESS3-3. Create a computational simulation to illustrate the relationships among the management of natural resources, the sustainability of human populations, and biodiversity.

HS-ESS3-4. Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.

HS-ESS3-6. Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.

HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

HS-ETS1-2. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

HS-ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

HS-ETS1-4. Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.

POWERPOINTS

WILDFIRES - NATURAL HISTORY

LESSON PLAN

INTRODUCTION:

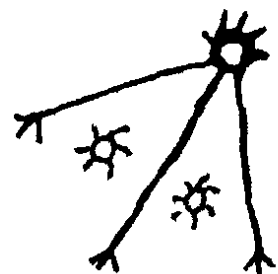
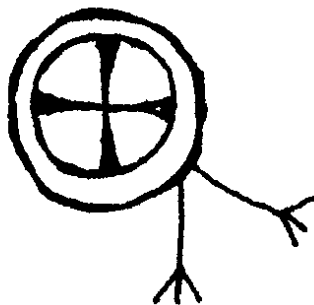
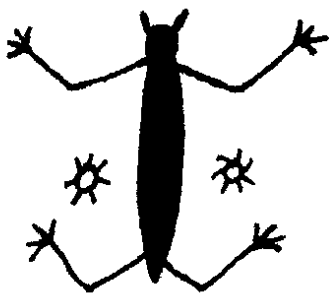
1. Explain: As a physical and important ecological process, fire plays a complex role in Southern California's Mediterranean ecosystem affecting the survival and preservation of the plants, animals, and humans within the ecosystem. By broadening our awareness and familiarity with local ecosystems and understanding why and how fires occur in Southern California, stakeholders can develop procedures to protect life and property, allow for future growth, and continue to preserve a valuable natural resource.
2. Ask the students what they already know about how fires naturally start or how Native Americans used fire.
3. Explain that your class will now start an exploration of historic wildfire conditions and Native American usage of fire.

LEARNING ACTIVITY:

Display *Wildfires: Natural History* PowerPoint presentation. Facilitate a dialogue about natural causes of wildfires and how Native Americans used fire using the notes in each slide of the PowerPoint as a reference if needed.

CHECK FOR UNDERSTANDING:

- What do you think California would look like today if people had not managed the land using fire?
- If you were one of the first humans in California, would you use fire to manage the land? Why?
- Why do you think it is important to study how wildfire was managed in the past?



POWERPOINTS

WILDLAND FIRE - A PHYSICAL PROCESS

WILDLAND FIRE - A PHYSICAL PROCESS

GOAL

This unit focuses on the physical aspect of fire and wildfire behavior including: ingredients of a fire, fire regimes, the wildland fire triangle and fire behavior.

ESSENTIAL QUESTION

What is fire and what affects wildfire conditions and behavior?

OBJECTIVES

- During this lesson, 100% of students will participate in a discussion about the physical process of wildfire including the ingredients of a fire, fire regimes, and wildfire behaviors.
- After this lesson, 50% of students will be able to identify and discuss the characteristics that make up a fire regime.
- During this lesson, 100% of students will participate in a discussion about what affects wildfire behavior in southern California and how different variables correspond to wildfire history in the area.
- After this lesson, 75% of students will be able to identify the three variables of the wildfire triangle and discuss how they each could affect wildfire behavior.

NGSS STANDARDS

HS-PS1-1. Use the periodic table as a model to predict the relative properties of elements based on the patterns of electrons in the outermost energy level of atoms.

HS-PS1-2. Construct and revise an explanation for the outcome of a simple chemical reaction based on the outermost electron states of atoms, trends in the periodic table, and knowledge of the patterns of chemical properties.

HS-PS1-5. Apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs.

HS-ESS3-5. Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth's systems.

HS-ESS3-6. Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.

LESSON PLAN

INTRODUCTION:

1. Explain: As a physical and important ecological process, fire plays a complex role in Southern California's Mediterranean ecosystem affecting the survival and preservation of the plants, animals, and humans within the ecosystem. By broadening our awareness and familiarity with local ecosystems and understanding why and how fires occur in Southern California, stakeholders can develop procedures to protect life and property, allow for future growth, and continue to preserve a valuable natural resource.
2. Ask the students what they already know about what starts wildfires and how they spread.
3. Explain that your class will now start an exploration of fire as a physical process and what affects wildfire behavior.

POWERPOINTS

WILDLAND FIRE - A PHYSICAL PROCESS

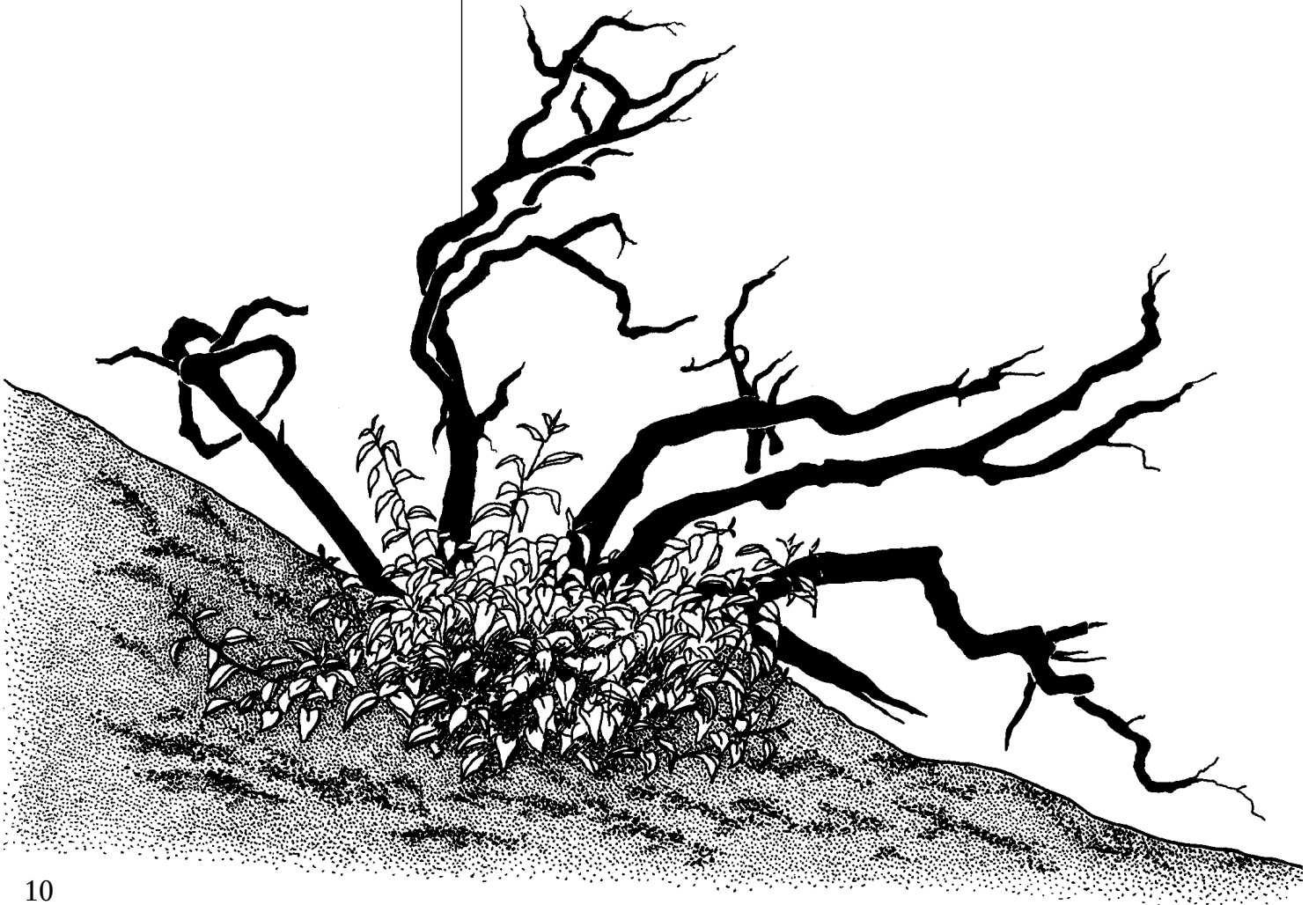
LESSON PLAN

LEARNING ACTIVITY:

Display *Wildland Fire: A Physical Process* PowerPoint presentation. Facilitate a dialogue about wildland fire using the notes in each slide of the PowerPoint as a reference if needed.

CHECK FOR UNDERSTANDING:

- What are the three ingredients of fire?
- What is a fire regime?
- What type of fire regime do we have in southern California?
- What are the three variables in the wildland fire triangle?
- How does weather affect wildfire behavior?
- How does topography affect wildfire behavior?
- How do fuels affect wildfire behavior?
- Why do we have fires in southern California?
- Why does Southern California have a high-severity, stand-replacing crown fire regime?



POWERPOINTS

WILDLAND FIRE IN THE SANTA MONICA MOUNTAINS

WILDLAND FIRE IN THE SANTA MONICA MOUNTAINS

GOAL

This unit covers the modern history of fires in the Santa Monica Mountains National Recreation Area and focuses on the 2013 Springs fire as well as the 2018 Woolsey fire. It includes opportunities to explore fire trends and frequency as well as looking at specific conditions that affected fire behavior in the mountains.

ESSENTIAL QUESTION

What is the fire history of the Santa Monica Mountains and has it changed?

OBJECTIVES

- During this lesson, 100% of students will compare the past fires of the SMMNRA and identify trends.
- During this lesson, 100% of students will observe and discuss the 2013 Springs Fire progression and the variables that may have affected the fire's behavior.
- After this lesson, 75% of students will be able to list one thing they should or should not do to help wildlife after a fire.

NGSS STANDARDS

HS-PS1-5. Apply scientific principles and evidence to provide an explanation about the effects of changing the temperature or concentration of the reacting particles on the rate at which a reaction occurs.

HS-LS2-2. Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.

HS-LS2-6. Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.

HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

HS-ESS3-3. Create a computational simulation to illustrate the relationships among the management of natural resources, the sustainability of human populations, and biodiversity.

HS-ESS3-4. Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.

HS-ESS3-5. Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth's systems.

HS-ESS3-6. Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.

HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

HS-ETS1-2. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

HS-ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

POWERPOINTS

WILDLAND FIRE IN THE SANTA MONICA MOUNTAINS

STANDARDS

HS-ETS1-4. Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.

LESSON PLAN

INTRODUCTION:

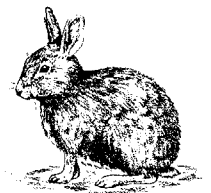
1. Explain: As a physical and important ecological process, fire plays a complex role in Southern California's Mediterranean ecosystem affecting the survival and preservation of the plants, animals, and humans within the ecosystem. By broadening our awareness and familiarity with local ecosystems and understanding why and how fires occur in Southern California, stakeholders can develop procedures to protect life and property, allow for future growth, and continue to preserve a valuable natural resource.
2. Class discussion: Ask the students if they have been affected by a wildfire and if they are comfortable, they may share their story with the classroom. Ask the students why some people are affected by wildfires, but others aren't. Ask the students if they have ever visited the Santa Monica Mountains? Can they name any fires that happened there? Why do fires occur in the Santa Monica Mountains?
3. Explain that your class will now start an exploration of the fires that occurred in the Santa Monica Mountains.

LEARNING ACTIVITY:

Display *Wildland Fire in the Santa Monica Mountains* PowerPoint presentation. Facilitate a dialogue about the modern fire history of the mountains using the notes in each slide of the PowerPoint as a reference if needed.

CHECK FOR UNDERSTANDING:

- What are the trends of the modern fire history in the SMMNRA?
- Are there areas that burn more than others? Why?
- What affects the fire behavior in the mountains?
- What was different about the Springs fire?
- What did you learn about the Woolsey fire that surprised you?



POWERPOINTS

FIRE ECOLOGY

FIRE ECOLOGY: THE RELATIONSHIP BETWEEN WILDFIRES & THE BIOTIC & ABIOTIC ENVIRONMENT

GOAL

This unit covers fire ecology including the relationships between plants, animals, humans and fire. Topics cover: chaparral fire response and recovery, animal fire response, and human causation of fire, effects of fire, and restoration and recovery after fire.

ESSENTIAL QUESTION

What are the relationships between wildfire and plants, animals, and humans?

OBJECTIVES

- During this lesson, 100% of students will participate in a discussion about fire ecology.
- After this lesson, 50% of students will be able to identify three strategies that chaparral uses to recover from wildfire.
- After this lesson, 75% of students will be able to identify two threats to plant communities when the fire interval is too short.
- After this lesson, 75% of students will be able to discuss the consequences of type-conversion.
- After this lesson, 95% of students will be able to identify how 98% of wildfires are started.
- After this lesson, 80% of students will have a changed perspective of wildfire, will understand that wildfire is something that we need to learn to live with, and will be able to discuss the relationships between wildfire and plants, animals, and humans.

NGSS STANDARDS

HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

HS-ESS3-3. Create a computational simulation to illustrate the relationships among the management of natural resources, the sustainability of human populations, and biodiversity.

HS-ESS3-4. Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.

HS-ESS3-5. Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth's systems.

HS-ESS3-6. Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.

HS-LS2-1. Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales.

HS-LS2-2. Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.

HS-LS2-6. Evaluate the claims, evidence, and reasoning that the complex interactions in ecosystems maintain relatively consistent numbers and types of organisms in stable conditions, but changing conditions may result in a new ecosystem.

HS-LS2-7. Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

POWERPOINTS

FIRE ECOLOGY

STANDARDS

HS-ETS1-1 Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

HS-ETS1-2. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

HS-ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

HS-ETS1-4. Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.

LESSON PLAN

INTRODUCTION:

1. Explain: As a physical and important ecological process, fire plays a complex role in Southern California's Mediterranean ecosystem affecting the survival and preservation of the plants, animals, and humans within the ecosystem. By broadening our awareness and familiarity with local ecosystems and understanding why and how fires occur in Southern California, stakeholders can develop procedures to protect life and property, allow for future growth, and continue to preserve a valuable natural resource.
2. Ask the students what they already know about fire ecology.
3. Explain that your class will now start an exploration of fire ecology: the relationships between fire and the biotic and abiotic environment.

LEARNING ACTIVITY:

Display *Fire Ecology: The relationship between wildfire & the biotic & abiotic environment* PowerPoint presentation. Facilitate a dialogue about fire ecology using the notes in each slide of the PowerPoint as a reference if needed.

CHECK FOR UNDERSTANDING:

- What is fire ecology?
- What are three ways chaparral plants recover from wildfire?
- What are the threats to chaparral ecosystems if the fire interval is too short?
- What are the consequences of type conversion?
- Why are some animals attracted to burn areas after a fire?
- How are most wildfires started?
- What are some ways humans can help to reduce the risk of starting a wildfire?
- How does wildfire affect humans?
- After a fire, should we let nature restore itself as it has done many times before or should we step in to help?
- What can we learn from wildfires?
- If you live in a city that provides you with all the things you need or an out-lying neighborhood with a wealth of amenities like good schools, nice parks, and nearby shopping facilities, why should you care about natural space, chaparral, or wildfires?

POWERPOINTS

FIRE ECOLOGY

LESSON PLAN

ADDITIONAL LEARNING ACTIVITIES:

1. **Video:**

Have the students watch the 23 minute USGS Living with Fire video:
<https://youtu.be/aJ9mE0TzrX0?t=1s>

2. **News Article:**

Have your students read the Ventura County Star article and watch the short video about the Springs Fire recovery:

<https://www.vcstar.com/story/news/special-reports/outdoors/2018/05/02/springs-fire-blackened-bare-hillsides-drought-california-wildfire-mugu-wildflowers-santa-monica/546906002/>

Have a discussion or create a writing assignment about how the Springs Fire burn scar is recovering based on what the students learned about how chaparral plants recover after a fire.



POWERPOINTS

WILDLAND URBAN INTERFACE: LEARNING TO LIVE WITH FIRES

WILDLAND URBAN INTERFACE: LEARNING TO LIVE WITH FIRES

GOAL

This unit covers the Wildland Urban Interface including how stakeholders can prepare for future fires, land management strategies, and career paths in wildland fire.

ESSENTIAL QUESTION

How can you prepare for the next wildfire?

OBJECTIVES

- After this lesson, 90% of students will be able to define Wildland Urban Interface and understand if they reside in this area.
- During this lesson, 100% of students will participate in a discussion about how to prepare for a wildfire.
- After this lesson, 85% of students will be able to identify two ways to get ready for a wildfire.
- After this lesson, 85% of students will be able to identify two ways to get set for a wildfire.
- After this lesson, 85% of students will be able to identify two things they need to do during an evacuation if a wildfire is threatening their home and lives.

NGSS STANDARDS

HS-ESS3-1. Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.

HS-ESS3-3. Create a computational simulation to illustrate the relationships among the management of natural resources, the sustainability of human populations, and biodiversity.

HS-ESS3-4. Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.

HS-ESS3-5. Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth's systems.

HS-ESS3-6. Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.

HS-ETS1-1. Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

HS-ETS1-2. Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

HS-ETS1-3. Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

HS-ETS1-4. Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.

POWERPOINTS

WILDLAND URBAN INTERFACE: LEARNING TO LIVE WITH FIRES

LESSON PLAN

INTRODUCTION:

1. Explain: As a physical and important ecological process, fire plays a complex role in Southern California's Mediterranean ecosystem affecting the survival and preservation of the plants, animals, and humans within the ecosystem. By broadening our awareness and familiarity with local ecosystems and understanding why and how fires occur in Southern California, stakeholders can develop procedures to protect life and property, allow for future growth, and continue to preserve a valuable natural resource.
2. Ask the students what they already know about the risks and impacts of humans living in the wildland/urban interface.
3. Explain that your class will now start an exploration of the risks, impacts, and management of the wildland/urban interface as well as how to be prepared for a wildfire.

LEARNING ACTIVITY:

Display *Wildland Urban Interface: Learning to Live with Wildfires* PowerPoint presentation. Facilitate a dialogue about the WUI using the notes in each slide of the PowerPoint as a reference if needed.

CHECK FOR UNDERSTANDING:

- What can you do in your home and with your family to prepare for a wildfire?

ADDITIONAL LEARNING ACTIVITIES:

1. **Wildfire Action Plan**

Have the students read through the Ready, Set, Go! brochures (included in Teacher Resources) and share with their family:

- [Get Ready - English](#)
- [Get Ready - Spanish](#)
- [Get Set - English](#)
- [Get Set - Spanish](#)
- [Go! - English](#)
- [Go! - Spanish](#)

Have students create their own wildfire (or house fire if they do not live in the WUI) action plan with their families.

Use this Calfire document as a guide:

http://www.readyforwildfire.org/docs/files/File/Ready-Set-Go-Plan-09_CALFIRE_sm.pdf

(For home fire evacuation plan: <https://www.nfpa.org/~media/files/public-education/campaigns/fire-prevention-week/fpw17/fpw17escapeplangrid.pdf>)

POWERPOINTS

WILDLAND URBAN INTERFACE: LEARNING TO LIVE WITH FIRES

LESSON PLAN

2. Class Project: Fire Safe Community Development

- Answer the question: *How do we preserve the local ecosystems while keeping communities safe from wildfires in Southern California?*
 - Create a Fire Safe Council by dividing the class into groups of different stakeholders:
 - Homeowners
 - Business owners
 - Utility company
 - Land management agency (NPS, USFS, etc.)
 - Fire Department
 - Local Government
 - Real Estate company
 - Insurance company
 - Etc...
 - Each group will design and/or model a fire safe community in the Wildland Urban Interface.
 - Each group will write a “Community Wildfire Protection Plan” for their community as well as outlining how the community will be constructed.
 - From the perspective of the stakeholders that they have chosen, they will need to research:
 - What are the needs of the fire safe community?
 - What are your personal goals and interests?
 - How do you create a community that compromises and creates a balance between these needs and personal interests?
 - (Land managers may not want any community, business owners may want a strip mall, home owners may not want to have to upgrade or maintain their homes to be firesafe, etc...)
 - Justify your decisions.
 - When each group has a community designed with a community wildfire protection plan for the residents, they can present them to the class.
 - The class can then host a town hall style meeting for the stakeholders to discuss their interests, concerns, agreements, and disagreements and see if they can agree on one common community plan for the class.
 - During the town hall, have a moderator use conflict resolution techniques to resolve conflict.
3. Follow FEMA’s Youth Emergency Preparedness Curriculum to further teach students about disaster preparedness.
https://www.fema.gov/media-library-data/ac2a3fd06796f89fcd284ddb3fea4797/FEMA_HS_TG_082613_508.pdf
4. **Recreational fire:** As a class or individually, have students go to <http://www.preventwildfireca.org/Campfire-Permit/> to watch the video and sign up to receive their campfire permit if desired.

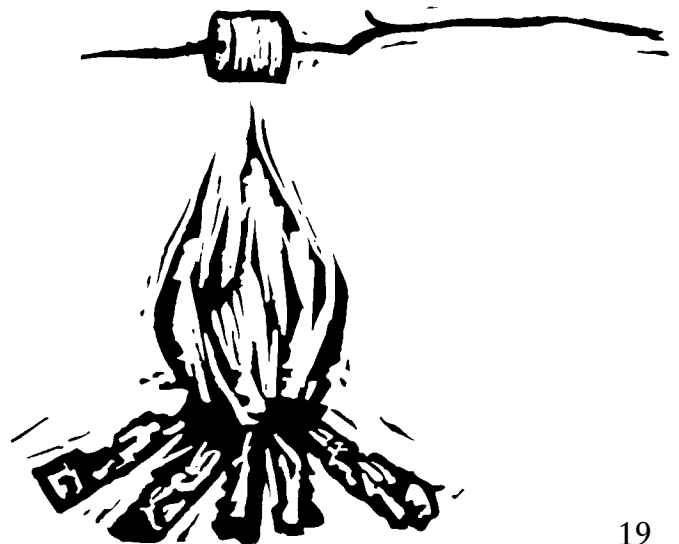
POWERPOINTS

WILDLAND URBAN INTERFACE: LEARNING TO LIVE WITH FIRES

LESSON PLAN

5. Media Report

- Discuss the difference between sensationalism and fact in the media with the class. Show examples.
- Have the students research and read 3 media reports online about wildfires and report whether they believe them to be fact or sensationalism or both.
- Have the students write or record on their electronic devices their own fictional (or based on a real wildfire) short media report. Students can write them from different perspectives using only facts.
- Perspectives could include:
 - Business Owners
 - Homeowners
 - Land managers
 - An animal or animals
 - A plant or plant community
 - Soil
 - Water
 - The Air
 - The biome
- These are all things that are affected by wildfire. Have the students research how they are affected and report from that perspective.
- Have them share their report with the class in a short presentation or share their video.



POWERPOINTS

WILDLAND FIRE CAREERS

WILDLAND FIRE CAREERS

GOAL

This lesson will spark a conversation about the different career paths that can be taken in the field of wildland fire and provides websites and videos about the jobs as well as where to start looking for positions.

ESSENTIAL QUESTION

What kind of job could I have in wildland fire and where do I start?

OBJECTIVES

- During this lesson, 75% of students will participate in a conversation about different wildfire career paths.
- After this lesson, 25% of students will seek further information about careers in wildland fire.

LESSON PLAN

INTRODUCTION:

1. Explain: As a physical and important ecological process, fire plays a complex role in Southern California's Mediterranean ecosystem affecting the survival and preservation of the plants, animals, and humans within the ecosystem. By broadening our awareness and familiarity with local ecosystems and understanding why and how fires occur in Southern California, stakeholders can develop procedures to protect life and property, allow for future growth, and continue to preserve a valuable natural resource.
2. Class discussion: Have you ever considered being a firefighter? Would you like to dig firebreaks on the ground? Drive a fire engine? Fly a helicopter? Jump out of an airplane? Use satellite technology to make a map of fires? Monitor fire effects on plants and animals?
3. Explain that your class will now start an exploration of wildland fire career paths.

LEARNING ACTIVITY:

Display *Wildland Fire Careers* PowerPoint presentation. Facilitate a dialogue about wildland fire careers using the notes in each slide of the PowerPoint as a reference if needed.

CHECK FOR UNDERSTANDING:

- Who is interested in learning more about this career?
- What steps could you take to start a career in wildland fire?

POWERPOINTS

WILDFIRES AND OUR HOME

WILDFIRES AND OUR HOME

GOAL

This PowerPoint is a supplemental lesson for elementary and middle school students to learn about the basics of wildland fire ecology before visiting the park. This presentation will teach students about the fire triangle, what influences fire behavior, and how it is related to southern California. Embedded in the program is an activity to discuss and create a model of the fire triangle and fire behavior.

ESSENTIAL QUESTION

Why do wildfires occur in southern California and how do they behave and impact our communities and natural areas?

OBJECTIVES

100% of the students will learn about what is required for a fire to start, what can influence fire behavior, and its role in our cultural and natural history.

STANDARDS

NEXT GENERATION SCIENCE STANDARDS

4-LS1-1, 4-LS1-2, 4-ESS2-1, 4-ESS3-1, 4-ESS3-2, 4-PS3-2

COMMON CORE STANDARDS

- Reading Standard. 4.1, 4.2, 4.3, 4.5, 4.7;
- Writing Standard. 4.1, 4.2, 4.7, 4.8, 4.9;
- Language Standard. 4.4, 4.6;
- Speaking and Listening Standard. 4.1, 4.4, 4.6

ENVIRONMENTAL EDUCATION INITIATIVES

- California Indian Peoples and Management of Natural Resources: Native peoples of California used the elements around them to create resources needed for survival.
- Reflections of Where We Live: Different aspects of human activity reflect the physical features of the environment in which they live.

LESSON PLAN

INTRODUCTION:

1. Explain: As a physical and important ecological process, fire plays a complex role in Southern California's Mediterranean ecosystem affecting the survival and preservation of the plants, animals, and humans within the ecosystem. By broadening our awareness and familiarity with local ecosystems and understanding why and how fires occur in Southern California, stakeholders can develop procedures to protect life and property, allow for future growth, and continue to preserve a valuable natural resource.
2. What comes to your mind when you hear about wildfires in the news? Wildfires are a natural part of the ecosystems in southern California, but with the movement of humans and development of our current life styles, fires occur more frequently.

LEARNING ACTIVITY:

Display *Wildfires and Our Home* PowerPoint presentation. Facilitate a dialogue about wildland fire using the notes in each slide of the PowerPoint as a reference if needed.

CHECK FOR UNDERSTANDING:

- What are the three things needed to start a fire?
- What affects fire behavior?
- What happens if fires burn too often?

TEACHER LED FIELD TRIP

FIELD TRIP

The goal of the Santa Monica Mountains National Recreation Area Fire Ecology program is to give students the opportunity to explore the subject of wildland fires and fire ecology in Southern California, including the relationship between wildland fire, the chaparral ecosystem, and human communities and how land managers are attempting to preserve the natural ecosystems while keeping communities safe.

The field trip is designed to complement the other units of the program. Although not necessary, the trip will provide the opportunity for students to expand on their classroom work and directly explore a burn scar while considering the impacts and recovery of the ecosystem and the people.

FIELD TRIP JOURNALS

Student journals include wildfire related activities to help you lead your own field trip and build upon information learned in the classroom. Print one journal per student or have the students share journals.

The student journal digital files are labeled as:

- Elementary Student Journal
- Middle School Student Journal
- High School Student Journal_any location (can take place in any burn area)
- High School Student Journal_RSV (for a visit to the Rancho Sierra Vista site)

However, the journals themselves do not include any grade levels so you can choose the journal that you think will work best for your class.

Each journal has an associated teacher guide and additional documents. Print one per teacher.

The teacher guide digital files are labeled as:

- Elementary Field Trip Teacher Guide
- Middle School Field Trip Teacher Guide
- High School Field Trip Teacher Guide_any location
- High School Field Trip Teacher Guide_RSV

Additional document to print for all grades:

- Plant Community Key

Additional document to print for Middle School:

- Scavenger Hunt Teacher Key_Middle School

Additional document to print for High School:

- Scavenger Hunt Teacher Key_High School

The following sections provide information about the journals, however, be sure to read the teacher guide associated with your journal of choice carefully for more detailed information including park information, directions, safety information, etc.

FIELD TRIP LOCATION

The field trip can take place in any recent burn scar in your area or the Santa Monica Mountains. Suggested sites within the park include *Paramount Ranch, Rancho Sierra Vista/Satwiwa, Circle X Ranch, Rocky Oaks, Peter Strauss Ranch, or Solstice Canyon*. **However, you must contact the park to make sure these sites are accessible and available for a field trip by calling (805) 370-2301 or email samo_education@nps.gov.**

High School Field Trip - Rancho Sierra Vista - This field trip is designed to take place in the Rancho Sierra Vista/Satwiwa site in the Santa Monica Mountains. See the *High School Field Trip Teacher Guide_RSV* for more information.

As this is a teacher-led field trip please feel free to visit any location that is convenient to you that has been affected by a recent wildfire. You may use or modify any of the activities suggested in this program to your needs.

TEACHER LED FIELD TRIP

ELEMENTARY

ELEMENTARY FIELD TRIP

GOAL

A trip to a burn scar has the potential to not only introduce students to their local wild lands, but also put them in direct contact with the subject of wildfire. Experiencing these together is essential to really understanding wildfires in Southern California.

ESSENTIAL QUESTION

What is fire? What is a wildfire and how do wildfires affect plants, animals, and humans?

OBJECTIVES

- During this field trip, 100% of students will be able to identify one piece of evidence that a wildfire occurred.
- During this field trip, 75% of students will have a discussion about what burns and why it burns.
- During this field trip, 75% of students will be able to identify something that looks like it has grown back after a fire and discuss the impact of fire on the plants and animals.
- After this field trip, 90% of students will be able to identify one thing that can start a fire.
- After this field trip, 20% of students will discuss with their family the ways that they can prepare for a fire and take actions to prepare.

MATERIALS

DIGITAL DOCUMENTS TO PRINT:

- Elementary Student Journal
- Elementary Field Trip Teacher Guide
- Plant Community Key

OPTIONAL MATERIALS

SUPPLIED BY THE TEACHER:

- Magnifying glasses
- Binoculars
- Crayons and/or colored pencils
- Clipboards

INSTRUCTIONS FOR PRINTING STUDENT JOURNALS:

The journals are in booklet form. Print them:

- “Horizontal layout, Double-sided flipped on the short edge”
- In Adobe Acrobat Reader, you may need to click the “multiple” button and change pages per sheet to “custom” “2” by “1”

NGSS STANDARDS

K-LS1-1, K-ESS2-2, K-ESS3-1

1-LS1-1, 1-LS3-1

2-PS1-1, 2-PS1-4, 2-LS2-1, 2-LS4-1

3-LS1-1, 3-LS4-3, 3-LS4-4

4-PS3-2

5-ESS2-1

TEACHER LED FIELD TRIP

ELEMENTARY

LESSON PLAN

This student journal includes three field activities and one at home activity. See the *Elementary Field Trip Teacher Guide* digital file for more details.

FIRE STARTERS

This activity is designed for students to think about what fire is and what can start a fire. Teachers can discuss what is needed to start fire: oxygen, heat, fuel.

FOCUS QUESTION

What is fire and what things can start a fire?

OBJECTIVE

During this activity, 100% of students will use their reasoning skills to determine the objects that could start a fire.

LEARNING ACTIVITY

- Have the students circle the objects on their journals that they think could start a fire.
- Have a discussion about their answers and what fire needs to start: oxygen, fuel, heat.

SCAVENGER HUNT

This activity is designed to encourage students to discover things that could burn in the natural area (fuels) and think about what might burn easier or faster.

FOCUS QUESTION

What kinds of things burn in nature and do some things burn faster than others?

OBJECTIVE

During this activity, 75% of students will identify one thing that could burn and think about how it would burn.

LEARNING ACTIVITY

- After a short rest, tell the students that they will be participating in a scavenger hunt.
- Have a discussion about what they are looking for and after they find their items, discuss which ones may burn faster and why. Background information is included for your reference about the plant communities in the Santa Monica Mountains.
- Continue the scavenger hunt along the trail until your next stop.

TIME TO GET CREATIVE

This activity is designed to encourage students to explore, as a naturalist would, the natural burned area and record their findings with drawings.

The questions at the bottom of the page could spark a conversation about what burns, why, and how is the land recovering.

FOCUS QUESTION

What are the different items we see in a burned area and what can we learn from them?

OBJECTIVE

During this activity, 100% of students will draw things they see and discuss what these things may mean.

TEACHER LED FIELD TRIP

ELEMENTARY

TIME TO GET CREATIVE

LEARNING ACTIVITY

- Find a nice, comfortable spot where the students can explore their surroundings closely and create nature drawings in their journals following the guidance in the boxes.
- Use the questions at the bottom to spark a conversation about what burns in a wildfire, why, and how the land recovers.

HOME FIRE QUESTIONS

This activity should be done at home with the student's guardians. The goal is to empower the students to take their new fire knowledge home and engage in a conversation with their guardians about wildfires and house fires and what they can do prepare for either.

FOCUS QUESTION

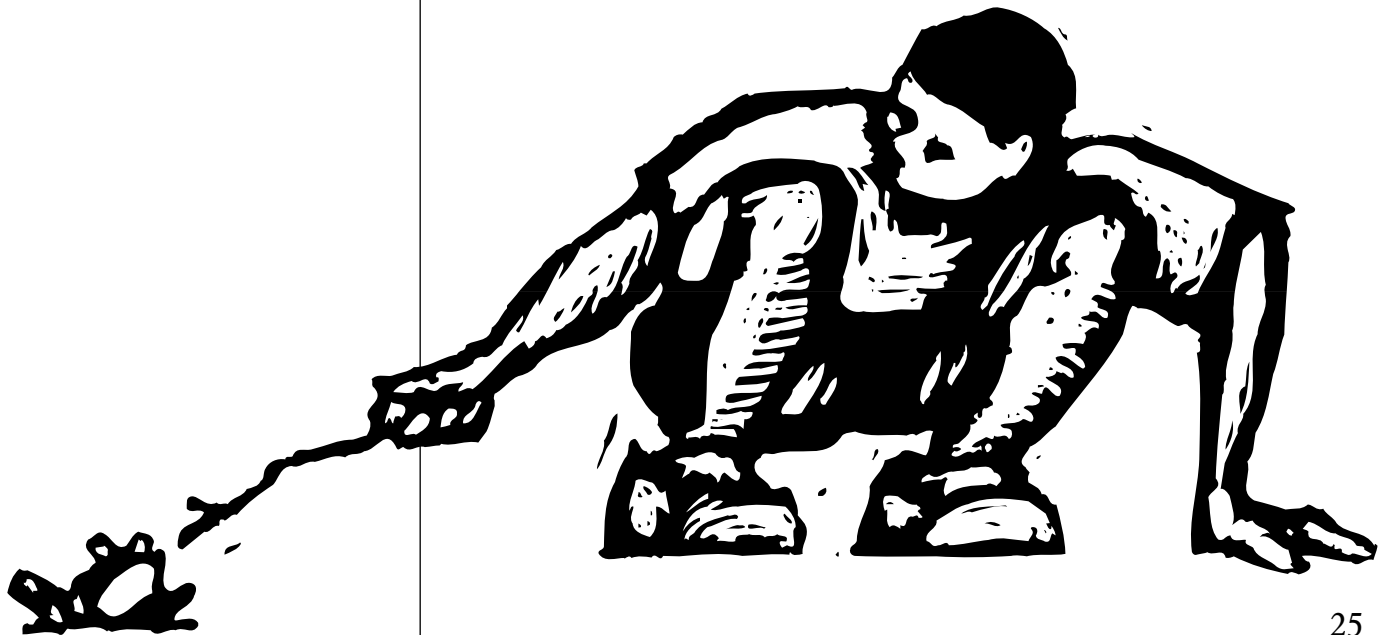
What can we do at home to prepare for a wildfire or house fire?

OBJECTIVE

During this activity, 75% of the students will complete the activity with their guardians and 25% will create a fire plan and put an emergency supply kit together.

LEARNING ACTIVITY

- Discuss the activity with the students in the classroom before sending it home to complete with their guardians.
- Discuss the fire plan for your school with the students.
- Optional: Put together an example Emergency Supply Kit in the classroom.



TEACHER LED FIELD TRIP

MIDDLE SCHOOL

MIDDLE SCHOOL FIELD TRIP

GOAL

A trip to a burn scar has the potential to not only introduce students to their local wild lands, but also put them in direct contact with the subject of wildfire. Experiencing these together is essential to really understanding wildfires in Southern California.

ESSENTIAL QUESTION

Why do wildfires occur in Southern California and how do we preserve the chaparral ecosystems while keeping communities safe?

OBJECTIVES

- After this field trip, 20% of students will be inspired by the information they learned or the experience that they had and will seek additional information or initiate similar experiences with their families.
- During this field trip, 100% of students will be able to identify one piece of evidence that a wildfire occurred.
- After this field trip, 50% of students will be able to identify one plant or animal that lives in the chaparral.
- After this field trip, 20% of students will understand what the Wildland Urban Interface is and discuss with their family the ways that they can prepare for a wildfire and take actions to prepare.

MATERIALS

DIGITAL DOCUMENTS TO PRINT:

- Middle School Student Journal
- Middle School Field Trip Teacher Guide
- Scavenger Hunt Key Teacher Key_ Middle School
- Plant Community Key

OPTIONAL MATERIALS

SUPPLIED BY THE TEACHER:

- Thermometer
- Sling psychrometer
- Anemometer
- Compass
- Magnifying glasses
- Binoculars

INSTRUCTIONS FOR PRINTING STUDENT JOURNALS:

The journals are in booklet form. Print them:

- “Horizontal layout, Double-sided flipped on the short edge”
- In Adobe Acrobat Reader, you may need to click the “multiple” button and change pages per sheet to “custom” “2” by “1”

TEACHER LED FIELD TRIP

MIDDLE SCHOOL

LESSON PLAN

This student journal includes four field activities. See the *Middle School Field Trip Teacher Guide* digital file for more details.

PARK RANGER DETECTIVE

This activity is designed for students to observe the burn scar around them and look for evidence that a wildfire has occurred and the recovery that is happening after the wildfire.

FOCUS QUESTION

Was there a wildfire and is the land recovering?

OBJECTIVES

- During this activity, 90% of students will use their senses to explore the land around them and record evidence of a wildfire.
-
- After this activity, 90% of students will be able to identify one thing that could provide evidence that there was a wildfire or that the land is recovering from fire damage.
-
- During this activity, 50% of students will be able to identify one piece of evidence that animals are or are not living in the burned area.

NGSS STANDARDS

MS-LS1-4
MS-LS1-5
MS-LS2-1
MS-LS2-3
MS-LS2-4

LEARNING ACTIVITY

- Have the students observe the land around them in one place or as you hike and answer the questions by writing or drawing in the boxes.
- Remind them of things they could look for such as blackened rocks and sticks or “skeletons” of plants, sprouting plants, and animal made holes or homes.

CHAPARRAL AND COASTAL SAGE SCRUB SCAVENGER HUNT

This activity is designed to encourage students to discover the biodiversity of chaparral and coastal sage scrub plant communities in a burned area.

FOCUS QUESTION

Why are chaparral plant communities important? How have they adapted to survive in this Mediterranean biome and how do they recover from wildfires?

OBJECTIVES

- During this activity, 100% of students will identify at least three Chaparral or Coastal Sage Scrub biotic factors.
- After this activity, 75% of students will be able to list one fact about a chaparral species.
- After this field trip, 20% of students will recall the name of the plant communities that they are exploring.

TEACHER LED FIELD TRIP

MIDDLE SCHOOL

CHAPARRAL AND COASTAL SAGE SCRUB SCAVENGER HUNT

NGSS STANDARDS

MS-LS1-4
MS-LS1-5
MS-LS2-1
MS-LS2-2
MS-LS2-3
MS-LS2-4

LEARNING ACTIVITY

- After a short rest, tell the students that they will be participating in a scavenger hunt.
- Have a discussion about the background information and instructions and answer any questions they may have.
- With each find, the students are to write the name of the flora or fauna and answer the question, share the provided information with your group, or complete the task associated with it.
- Students can use the Scavenger Hunt Word Bank for identification purposes.
- Continue the scavenger hunt along the trail until your next stop.

OPTIONAL BIODIVERSITY BONUS!

- iNaturalist is a citizen science project and online social network of naturalists, citizen scientists, and biologists built on the concept of mapping and sharing observations of biodiversity across the globe.
- Find it in your app store or visit [inaturalist.org](https://www.inaturalist.org). You can create a classroom account. It is free!
- During their visit, have the students take pictures of at least three plants or animals in the chaparral and you can upload them to a class inaturalist account for identification.
- Before the field trip, visit:
<https://www.inaturalist.org/pages/getting+started>
or watch the video at: <https://vimeo.com/162581545>
for more information about how to use iNaturalist and have the students download the app.
- When you return you can analyze the data collected to help determine how healthy the ecosystems in the park are based on the biodiversity data collected.

TEACHER LED FIELD TRIP

MIDDLE SCHOOL

WILDLAND URBAN INTERFACE FILL IN THE BLANKS

This activity is designed to help students understand the Wildland Urban Interface (WUI).

Students will recognize the threats that wildfires pose to these communities and think about actions that they can take to protect themselves and their families from a wildfire.

FOCUS QUESTION

Why are wildland urban interface areas significant in relation to wildfire impact and management and what can you do to prepare for the next wildfire?

OBJECTIVES

- During this activity, 80% of students will participate in a discussion about the significance of the WUI.
- After this field trip, 20% of students will discuss with their family the ways that they can pre-prepare for a wildfire and take actions to prepare.

NGSS STANDARDS

MS-ETS1-1
MS-ETS1-2
MS-ETS1-3
MS-ESS3-2
MS-ESS3-3
MS-LS2-1
MS-LS2-2
MS-LS2-4
MS-LS2-5

LEARNING ACTIVITY

- If available, have the students observe the wildland urban interface. Discuss the risks and impacts involved in living in the WUI and the actions that stakeholders can take to reduce these risks.
- Have the students fill in the blanks of the WUI activity using the key.
- Have the students write or draw things they think they should put in their emergency supply kits.



TEACHER LED FIELD TRIP MIDDLE SCHOOL

FIELD JOURNAL NOTES & DRAWINGS & REFLECTION

The field journal notes section can be used throughout the hike to take notes or record findings.

The reflection activity is designed as a quiet reflection that can happen any time after the hike.

FOCUS QUESTION

What have you learned or experienced on your visit to the Santa Monica Mountains or a burned area?

OBJECTIVE

During this activity, 75% of the students will recall an interesting fact they learned or an experience or feeling they had.

LEARNING ACTIVITY

- After lunch, in class, or at home have the students reflect on their hike and/or visit.
- Have the students write in their reflection page of their field journal. They can use the questions as a guide, share what they learned, or just share what was special to them about the visit.



TEACHER LED FIELD TRIP HIGH SCHOOL - ANY LOCATION

HIGH SCHOOL FIELD TRIP - ANY LOCATION

GOAL

The goal of the Santa Monica Mountains National Recreation Area Fire Ecology program is to give students the opportunity to explore the subject of wildland fires and fire ecology including the relationship between wildland fire, the chaparral ecosystem, and human communities including how land managers are attempting to preserve the natural ecosystems while keeping communities safe.

The field trip is designed to complement the other units of the program. Although not necessary, the trip will provide the opportunity for students to expand on their classroom work and directly explore a burn scar while considering the impacts and recovery of the ecosystem and the people.

ESSENTIAL QUESTION

Why do wildfires occur in Southern California and how do we preserve the chaparral ecosystems while keeping communities safe?

OBJECTIVES

- After this field trip, 20% of students will be inspired by the information they learned or the experience that they had and will seek additional information or initiate similar experiences.
- After this field trip, during a wildfire occurrence, 40% of students will take notice of wildfire behavior conditions (Santa Ana winds, temperature, humidity, etc.) and understand how they are affecting the wildfire.
- After this field trip and after a wildfire occurrence, 20% of students will recall the strategies that chaparral plants are using to recover and 5% of students will travel to a burn scar to witness the recovery.
- After this field trip, 20% of students will discuss with their family the ways that they can prepare for a wildfire and take actions to prepare.

MATERIALS

DIGITAL DOCUMENTS TO PRINT:

- High School Student Journal_any location
- High School Field Trip Teacher Guide_any location
- Scavenger Hunt Teacher Key_High School
- Plant Community Key

OPTIONAL MATERIALS

SUPPLIED BY THE TEACHER:

- Thermometer
- Sling psychrometer
- Anemometer
- Compass
- Magnifying glasses
- Binoculars

INSTRUCTIONS FOR PRINTING STUDENT JOURNALS:

The journals are in booklet form. Print them:

- “Horizontal layout, Double-sided flipped on the short edge”
- In Adobe Acrobat Reader, you may need to click the “multiple” button and change pages per sheet to “custom” “2” by “1”

TEACHER LED FIELD TRIP

HIGH SCHOOL - ANY LOCATION

LESSON PLAN

This student journal includes four field activities. See the *High School Field Trip Teacher Guide_any location* digital file for more details.

WILDFIRE BEHAVIOR OBSERVATION STATION

This 10-20 minute activity is designed for students to observe the plant communities around them, determine what communities they are looking at, and use their senses to observe (or instruments to measure) variables in these communities that may affect wildfire behavior.

FOCUS QUESTION

What affects wildfire behavior?

OBJECTIVES

- During this activity, 90% of students will use their senses or instruments to measure wildfire behavior variables that are a part of these ecosystems.
- After this activity, 90% of students will be able to identify 2 plant communities in the Santa Monica Mountains.
- After this field trip, during a wildfire occurrence, 40% of students will take notice of wildfire behavior variables (Santa Ana winds, temperature, humidity, etc.) and understand how they are affecting the wildfire.

NGSS STANDARDS

Grade 7-MS-ESS3-2
Grade 8-MS-ESS3-4
HS-PS1-5
HS-LS2-2
HS-ETS1-1
HS-ESS3-5

LEARNING ACTIVITY

- Have the students observe the plant communities around them.
- Use the plant community key or have a discussion to identify as many communities as possible.
- Have the students use their senses to observe or scientific instruments, if available, to answer the questions in their field journals.

CHAPARRAL AND COASTAL SAGE SCRUB SCAVENGER HUNT

This 20 minute activity is designed to encourage students to discover the biodiversity of chaparral and coastal sage scrub plant communities while closely exploring the biotic and abiotic factors surrounding them looking for flora and fauna as well as plant adaptations and wildfire recovery strategies.

FOCUS QUESTION

Why are chaparral plant communities important? How have they adapted to survive in this Mediterranean biome and how do they recover from wildfires?

TEACHER LED FIELD TRIP HIGH SCHOOL - ANY LOCATION

CHAPARRAL AND COASTAL SAGE SCRUB SCAVENGER HUNT

OBJECTIVES

- During this activity, 100% of students will identify at least three Chaparral or Coastal Sage Scrub biotic factors.
- After this activity, 75% of students will be able to discuss how chaparral plants have adapted to survive in this biome.
- After this field trip and after a wildfire occurrence, 20% of students will recall the strategies that chaparral plants are using to recover and 5% of students will travel to a burn scar to witness the recovery.

NGSS STANDARDS

Grade 7-MS-LS2-4

Grade 8-MS-ESS3-4

HS-LS2-1

HS-LS2-2

HS-LS2-6

HS-LS2-7

HS-LS4-5

HS-ESS3-3

LEARNING ACTIVITY

- After a short rest, tell the students that they will be participating in a scavenger hunt.
- Have them read the background information and instructions and answer any questions they may have.
- With each find, the students are to write the name of the flora or fauna and answer the question, share the provided information with your group, or complete the task associated with it.
- Students can use the Scavenger Hunt Word Bank for identification purposes.
- Continue the scavenger hunt along the trail until your next stop.

OPTIONAL BIODIVERSITY BONUS!

- iNaturalist is a citizen science project and online social network of naturalists, citizen scientists, and biologists built on the concept of mapping and sharing observations of biodiversity across the globe.
- Find it in your app store or visit [inaturalist.org](https://www.inaturalist.org). You can create a classroom account. It is free!
- During their visit, have the students take pictures of at least three plants or animals in the chaparral and you can upload them to a class inaturalist account for identification.
- Before the field trip, visit:
<https://www.inaturalist.org/pages/getting+started>
or watch the video at: <https://vimeo.com/162581545>
for more information about how to use iNaturalist and have the students download the app.
- When you return you can analyze the data collected to help determine how healthy the ecosystems in the park are based on the biodiversity data collected.

TEACHER LED FIELD TRIP

HIGH SCHOOL - ANY LOCATION

WILDLAND URBAN INTERFACE FILL IN THE BLANKS

This 10-15 minute activity is designed for students to see first-hand a Wildland Urban Interface (WUI).

Students will recognize the threats that wildfires pose to these communities, understand the delicate balance of management that land and fire managers face every day to protect the public while also protecting valuable natural resources, and think about actions that they can take to protect themselves and their families from a wildfire.

FOCUS QUESTION

Why are wildland urban interface areas significant in relation to wildfire impact and management and what can you do to prepare for the next wildfire?

OBJECTIVES

- During this activity, 80% of students will participate in a discussion about the significance of the WUI.
- After this field trip, 20% of students will discuss with their family the ways that they can pre-prepare for a wildfire and take actions to prepare.

NGSS STANDARDS

Grade 7-MS-ESS3-2

Grade 7-MS-LS2-5

Grade 7-MS-LS2-4

Grade 8-MS-ESS3-4

Grade 8-MS-ETS1-1

HS-ETS1-1

HS-ETS1-2

HS-ETS1-3

HS-ETS1-4

HS-LS2-7

HS-ESS3-1

HS-ESS3-3

HS-ESS3-4

HS-ESS3-6

LEARNING ACTIVITY

- If available, have the students observe the wildland urban interface. Discuss the risks and impacts involved in living in the WUI and the actions that stakeholders can take to reduce these risks.
- Have the students fill in the blanks of the WUI activity using the key.

TEACHER LED FIELD TRIP HIGH SCHOOL - ANY LOCATION

REFLECTION

This activity is designed as a quiet reflection that can happen any time after the hike.

FOCUS QUESTION

What have you learned or experienced on your visit to the Santa Monica Mountains or a burned area?

OBJECTIVE

During this activity, 75% of the students will recall an interesting fact they learned or an experience they had.

LEARNING ACTIVITY

- After lunch, in class, or at home have the students reflect on their hike and/or visit.
- Have the students write in their reflection page of their field journal. They can use the questions as a guide, share what they learned, or just share what was special to them about the visit.
- **Optional:** Have the students use their phones to record a 30 second Public Service Announcement (PSA). They can use the questions as a guide, share what they learned, or just share what was special to them about the visit.



TEACHER LED FIELD TRIP

HIGH SCHOOL - RANCHO SIERRA VISTA

HIGH SCHOOL FIELD TRIP - RANCHO SIERRA VISTA

GOAL

The goal of the Santa Monica Mountains National Recreation Area Fire Ecology program is to give students the opportunity to explore the subject of wildland fires and fire ecology including the relationship between wildland fire, the chaparral ecosystem, and human communities including how land managers are attempting to preserve the natural ecosystems while keeping communities safe.

The field trip is designed to complement the other units of the program. Although not necessary, the trip will introduce the students directly to a chaparral and coastal sage scrub (soft chaparral) ecosystem that burned in 2013.

ESSENTIAL QUESTION

Why do wildfires occur in Southern California and how do we preserve the chaparral ecosystems while keeping communities safe?

OBJECTIVES

- After this field trip, 20% of students will be inspired by the information they learned or the experience that they had and will seek additional information or initiate similar experiences.
- After this field trip, during a wildfire occurrence, 40% of students will take notice of wildfire behavior conditions (Santa Ana winds, temperature, humidity, etc.) and understand how they are affecting the wildfire.
- After this field trip and after a wildfire occurrence, 20% of students will recall the strategies that chaparral plants are using to recover and 5% of students will travel to a burn scar to witness the recovery.
- After this field trip, 20% of students will discuss with their family the ways that they can prepare for a wildfire and take actions to prepare.

MATERIALS

DIGITAL DOCUMENTS TO PRINT:

- High School Student Journal_RSV
- High School Field Trip Teacher Guide_RSV
- Scavenger Hunt Teacher Key_High School
- Plant Community Key
- Hiking maps available at <https://www.nps.gov/samo/planyourvisit/rsvsatwiwa.htm>

OPTIONAL MATERIALS

SUPPLIED BY THE TEACHER:

- Thermometer
- Sling psychrometer
- Anemometer
- Compass
- Magnifying glasses
- Binoculars

INSTRUCTIONS FOR PRINTING STUDENT JOURNALS:

The journals are in booklet form. Print them:

- “Horizontal layout, Double-sided flipped on the short edge”
- In Adobe Acrobat Reader, you may need to click the “multiple” button and change pages per sheet to “custom” “2” by “1”

TEACHER LED FIELD TRIP

HIGH SCHOOL - RANCHO SIERRA VISTA

LESSON PLAN

This student journal includes four field activities. See the *High School Field Trip Teacher Guide_RSV* digital file for more details.

WILDFIRE BEHAVIOR OBSERVATION STATION

This 10-20 minute activity is designed for students to observe the plant communities around them, determine what communities they are looking at, and use their senses to observe (or instruments to measure) variables in these communities that may affect wildfire behavior.

FOCUS QUESTION

What affects wildfire behavior?

OBJECTIVES

- During this activity, 90% of students will use their senses or instruments to measure wildfire behavior variables that are a part of these ecosystems.
- After this activity, 90% of students will be able to identify 2 plant communities in the Santa Monica Mountains.
- After this field trip, during a wildfire occurrence, 40% of students will take notice of wildfire behavior variables (Santa Ana winds, temperature, humidity, etc.) and understand how they are affecting the wildfire.

NGSS STANDARDS

Grade 7-MS-ESS3-2
Grade 8-MS-ESS3-4
HS-PS1-5
HS-LS2-2
HS-ETS1-1
HS-ESS3-5

LEARNING ACTIVITY

- Have the students observe the plant communities around them.
- Use the plant community key or have a discussion to identify as many communities as possible.
- Have the students use their senses to observe or scientific instruments, if available, to answer the questions in their field journals.

CHAPARRAL AND COASTAL SAGE SCRUB SCAVENGER HUNT

This 20 minute activity is designed to encourage students to discover the biodiversity of chaparral and coastal sage scrub plant communities while closely exploring the biotic and abiotic factors surrounding them looking for flora and fauna as well as plant adaptations and wildfire recovery strategies.

FOCUS QUESTION

Why are chaparral plant communities important? How have they adapted to survive in this Mediterranean biome and how do they recover from wildfires?

TEACHER LED FIELD TRIP

HIGH SCHOOL - RANCHO SIERRA VISTA

CHAPARRAL AND COASTAL SAGE SCRUB SCAVENGER HUNT

OBJECTIVES

- During this activity, 100% of students will identify at least three Chaparral or Coastal Sage Scrub biotic factors.
- After this activity, 75% of students will be able to discuss how chaparral plants have adapted to survive in this biome.
- After this field trip and after a wildfire occurrence, 20% of students will recall the strategies that chaparral plants are using to recover and 5% of students will travel to a burn scar to witness the recovery.

NGSS STANDARDS

Grade 7-MS-LS2-4

Grade 8-MS-ESS3-4

HS-LS2-1

HS-LS2-2

HS-LS2-6

HS-LS2-7

HS-LS4-5

HS-ESS3-3

LEARNING ACTIVITY

- After a short rest, tell the students that they will be participating in a scavenger hunt.
- Have them read the background information and instructions and answer any questions they may have.
- With each find, the students are to write the name of the flora or fauna and answer the question, share the provided information with your group, or complete the task associated with it.
- Students can use the Scavenger Hunt Word Bank for identification purposes.
- Continue the scavenger hunt along the trail until your next stop.

OPTIONAL BIODIVERSITY BONUS!

- iNaturalist is a citizen science project and online social network of naturalists, citizen scientists, and biologists built on the concept of mapping and sharing observations of biodiversity across the globe.
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TEACHER LED FIELD TRIP

HIGH SCHOOL - RANCHO SIERRA VISTA

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HS-ETS1-2

HS-ETS1-3

HS-ETS1-4

HS-LS2-7

HS-ESS3-1

HS-ESS3-3

HS-ESS3-4

HS-ESS3-6

LEARNING ACTIVITY

- Have the students observe the wildland-urban interface. Discuss the risks and impacts involved in living in the WUI and the actions that stakeholders can take to reduce these risks.
- Have the students fill in the blanks of the WUI activity using the key.

TEACHER LED FIELD TRIP HIGH SCHOOL - RANCHO SIERRA VISTA

REFLECTION

This activity is designed as a quiet reflection that can happen any time after the hike.

FOCUS QUESTION

What have you learned or experienced on your visit to the Santa Monica Mountains?

OBJECTIVE

During this activity, 75% of the students will recall an interesting fact they learned or an experience they had.

LEARNING ACTIVITY

- After lunch, in class, or at home have the students reflect on their hike and/or visit.
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PREPARING FOR YOUR DAY IN THE PARK

PREPARING FOR YOUR DAY IN THE PARK

The following is a check list with tips to help you prepare yourself, your students, and your chaperones for a day out in the park. By preparing your students, you are ensuring that they will have a safe and enjoyable experience.

STAY SAFE & KNOW THE RULES

- In order to have a fun and exciting experience, a firm framework of rules should be discussed in advance with students and chaperones. Include the following points:
 - Remind your group that they are entering into a National Park and everything here is protected. Respect both plants and animals.
 - Disturbance of wildlife, picking vegetation, collecting or throwing any natural objects, or any other destructive behavior is not allowed. Please model good behavior and remind chaperones to do the same.
 - Respect the rights of others visiting the park by refraining from disruptive behavior.
 - Respect each other, the teachers, and the chaperones.

SOME SAFETY GUIDELINES ARE OUTLINED IN EACH FIELD TRIP TEACHER GUIDE. PLEASE KEEP THE FOLLOWING IN MIND AS WELL:

- It is a good idea to have a charged cell phone with the group. Know the name and address of the location you are visiting and in an emergency, call 911.
- Keep a first aid kit with each group and be aware of any medical concerns such as allergies with each student.
- Always be aware of the possibility of seeing wildlife. Teachers should stay at the front of the group to watch for animals and hazards. Snakes are often seen during warmer days. If you see a snake, step back and assess whether you can let the animal move on or if you can walk around it. Turn around if the situation does not feel safe. Rattlesnakes are the only venomous snakes.
- Stay on the trail to avoid unwanted contact with wildlife including ticks. Ticks hang on the ends of grasses. Have everyone in the group do a full body check for ticks at the end of the trip. Carry tweezers or a tick remover if available.
- Weather can change rapidly. The best way to stay safe is to be prepared and pay attention. Be prepared by having adequate clothing for weather situations that could occur. As you get closer to your field trip date, please check local weather reports. In cases of rain or extreme wind or heat, you may want to postpone your trip.

WEATHER

FOOD & WATER

- Picnic tables are available at many sites, however there are no food or beverages sold at any site. Before you board the bus, please have students separate out a snack for when they arrive. Upon arrival, it is a good idea to take a brief bathroom/snack break. Lunch can often be stored on the bus until the lunch break depending on your plan. Water is available at some sites, check <https://www.nps.gov/samo/planyourvisit/placestogo.htm> for more information. Please encourage students to bring water and, if possible, to bring reusable bottles.

PREPARING FOR YOUR DAY IN THE PARK

DRESS FOR SUCCESS

- Maximize your students' enjoyment by encouraging them to wear appropriate clothing for predicted weather and to be prepared for the weather to change. Encourage students to wear light colored clothing and proper footwear. Students do not need to wear hiking boots, however close-toed sturdy shoes are helpful.

PACK PROPERLY

- It is your choice whether you want students to carry their backpacks for this trip. Packing properly can make a hike with students more enjoyable. Try to have extra water or snacks in your pack.
- Encourage students to leave electronics at home or on the bus. Have a discussion about using this time as an opportunity to disconnect and experience the world around them. If you know that devices (even cameras) will be a problem for students, please ask them to leave the devices behind.

If students want to bring devices to take photos or for iNaturalist, ask them to keep them in their pockets or bag until you are stopped. Do not allow them to walk with devices in their hands, due to the tripping hazard.

ON THE HIKE

- Hiking is a time for students to observe the world around them, ask questions, and get some exercise.
- Hike difficulty will depend on your location of choice. We encourage you to visit your field trip location prior to the field trip and assess the hike.
- As you lead the hike, walk only as fast as your slowest student but encourage students to keep moving. Stop from time to time to rest and check in with students and remind them to sip their water.
- We encourage you to stay on trails, not to touch plants you don't recognize, and to stay together.

SUPERVISION/CHAPERONES

- We recommend that you provide a ratio of one adult for every 10 students. Keep in mind that sometimes, too many chaperones may not be helpful. Use your judgement.
- Please take time to talk to parents about their roles as chaperones; chaperones are there to help you with supervision and safety. Students will look to them to set good examples of participation. Please remind chaperones to participate actively during the trip and model the same behavior requested of the students such as not using cell phones during the field trip.
- This is a field trip for students so we recommend that you ask that adults refrain from answering questions directed at students. As with your students, encourage chaperones to come appropriately dressed with packed lunches and water.
- Discipline is the responsibility of the teacher and chaperones.
- Depending on the number of students, teachers, and chaperones, you may want to divide students into two groups. Groups can walk opposite directions on the hike.