

# Nature Rangers



<a href="#">Nature Rangers Program Overview</a>	2
<a href="#">Nature Rangers Field Trip Outline</a>	4
<a href="#">Nature Rangers Classroom Kit</a>	6
<a href="#">Nature Rangers Classroom Presentation</a>	8
<a href="#">Additional Resources</a>	9



**SANTA CRUZ MUSEUM**  
of natural history

# Nature Rangers Program Overview

**Grade:** 4th

**Topic:** Students practice being naturalists by making observations and comparing natural communities and different ecosystems as they go on a 2-mile hike through Pogonip Open Space Preserve. Thinking about nature as a system, physically connecting these ecosystems by walking through them and collecting data to compare them, help students better understand the environment and begin to realize they too are part of natural systems.

**Why is this a relevant and interesting topic?** In the process of developing observation skills in nature, students also build and apply foundational knowledge in the fields of biology, ecology, geography, and history. This unique learning environment allows students of multiple learning intelligences to thrive and connect to nature and science. Repeating observations, finding patterns, and making connections as they move through different habitats is an engaging and rewarding way for students to develop common science practices that will benefit their science education in the classroom. Thinking about nature as a system, and physically connecting these ecosystems by walking through them, helps students to come closer to the environment and begin to realize that they too are a part of natural systems.

**Stewardship Goals:** Students create a concrete connection to the natural world through observation and exploration and be inspired not only to return to a local natural setting, but to look closely at it and realize their role in it. They will be prepared to:

1. Make choices that demonstrate an understanding that the health of their environment influences their own health and that of their community.
2. Notice plants and consider their value/use for food, tools, shelter, etc.
3. Take action to conserve resources with an understanding that all animals, including humans, are connected and need clean food, air, water, and space to survive.

**Objectives** *By the end of the program, students will:*

1. Correctly identify three local natural communities, the features that distinguish them, and how they fit into a model of ecological succession.
2. Understand how both living and nonliving factors cause change in these communities, as well as the role of water in shaping the characteristics of each.
3. Share examples of how humans affect these ecosystems, including management and historical use.

The items in this list assume that a class uses the classroom presentation and kit in addition to attending the field trip. [Click here](#) for a more detailed look at the standards and how this program supports them.

Next Generation Science Standards		
<p align="center"><b>Performance Expectations</b></p> <p><b>4-LS1-1:</b> Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.</p> <hr/> <p><b>4-ESS2-1:</b> Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.</p>		
<p><b>Science and Engineering Practices</b></p> <p>Engaging in Argument from Evidence</p> <hr/> <p>Planning and Carrying Out Investigations</p>	<p><b>Disciplinary Core Ideas</b></p> <p><b>LS1.A:</b> Structure and Function</p> <hr/> <p><b>ESS2.A:</b> Earth Materials and Systems</p> <hr/> <p><b>ESS2.E:</b> Biogeology</p>	<p><b>Crosscutting Concepts</b></p> <p>Systems and System Models</p> <hr/> <p>Cause and Effect</p>
California Environmental Principles and Concepts		
<p><b>Principle II:</b> The long-term functioning and health of terrestrial, freshwater, coastal, and marine ecosystems are influenced by their relationships with human societies.</p>		
ELA/Literacy		
<p><b>W.4.7:</b> Conduct short research projects that build knowledge through investigation of different aspects of a topic.</p> <p><b>W.4.8:</b> Recall relevant information from experiences or gather relevant information from print and digital sources; take notes, paraphrase, and categorize information, and provide a list of sources.</p> <p><b>RI.4.3:</b> Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.</p>		
Mathematics		
<p><b>4.MD.A.1:</b> Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec.</p> <p><b>4.NF.6:</b> Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram</p>		
History-Social Science Standards		
<p><b>HSS4.1.5:</b> Use maps, charts, and pictures to describe how communities in California vary in land use, vegetation, wildlife, climate, population density, architecture, services, and transportation.</p> <p><b>HSS4.2.1:</b> Discuss the major nations of California Indians, including their geographic distribution, economic activities, legends, and religious beliefs; and describe how they depended on, adapted to, and modified the physical environment by cultivation of land and use of sea resources.</p>		

# Nature Rangers Field Trip Outline

## Pre-Trip Preparation:

The Pogonip Open Space is an exciting place to explore, but it is not an urban park. There are no accessible bathrooms or water fountains in the area. We recommend you have your students use the restroom and fill up water bottles before leaving school; our staff have toilet paper and hand sanitizer in their field backpacks for emergencies on the trail. [Parking is fairly limited](#), so it is best to consolidate space as much as possible if your group is carpooling. You may also want to go over the topic of poison oak and ticks ahead of time with your class, although our experienced outdoor education team runs through a safety talk on these subjects at the beginning of every field trip. **Students should wear comfortable shoes with good traction, bring a jacket, water bottle, snack, hat (optional), and sunscreen.** Our field trips run rain or shine as long as the weather is safe. Please have students dress appropriately for the weather.

**Nature Rangers Meeting Location:** [700 Spring Trail, Santa Cruz, CA 95060.](#)

**Note this is a new location for the 2025-2026 school year.** Parking is available on the street. Our staff will have parking permits that allow your drivers to park for 3 hours instead of the posted 2 hours. We will meet at the end of Spring Street. If your group is arriving by bus please do not go to the end of Spring Street the bus will NOT be able to turn around please drop off on Rock Ridge Ln which has a turn around area at the end.

## Field Trip:

We will do our best to adhere to the following outline. Please let our staff know as soon as possible if your class has specific needs with respect to timing, such as needing to leave early. Late arrivals or early departures may result in the exclusion of some parts of the program.

***Total program time: 3 hours***

Greeting: 15 minutes

Walking Tour: 2.5 hours

Conclusion: 15 minutes

## Greeting

Museum staff will meet the class at the end of Spring Street. The program will begin at the Spring street trailhead and go down the Spring Trail to the Springs where we will turn around and head back to the trail head.

**Time:** 15 minutes

**Location:** Spring Street Trailhead

**Objectives:** Review safety information about poison oak and ticks, review the concept of communities, get students into “observation mode”.

**Vocabulary:** Community, senses, observation, biodiversity

## Hike

Staff have planned activities (listed below) that allow for hands-on learning about subjects related to communities and ecological interactions. Because our outdoor setting provides many unplanned learning experiences, your group may not get to every activity.

### Skull Observation

**Time:** 10 minutes

**Location:** Along the trail

**Objectives:** Students spend hands-on time observing, discussing, and asking questions about two sample skulls (a coyote and a deer). They are engaged in conversations about how animals from different communities interact.

**Vocabulary:** adaptations, camouflage, canine teeth, herbivore, carnivore

**Materials:** replica deer and coyote skulls

### Data Collection

**Time:** 10 minutes

**Location:** One stop in each of the three main plant communities

**Objectives:** Throughout the hike staff engage students in moments of observation that help them discover the differences and similarities (and sources of change) in the three communities. These communities are Meadow, Redwood Forest, and Mixed Evergreen. At three locations they determine their location using a map, measure and document temperature, canopy cover, and ground composition (i.e. bare soil, leaves or duff, or growing plants).

**Vocabulary:** Canopy cover, groundcover, temperature, soil, community

**Materials:** Thermometers, densiometers

### Conclusion

**Time:** 15 minutes

**Location:** Spring Street Trailhead

**Objectives:** Review the data collected during the hike, compare results and interpret what they mean. Compare and contrast plant communities and adaptations that plants and animals need to survive there. Answer any lingering questions.

# Nature Rangers Classroom Kit

## Why do we provide the Classroom Kit?

This classroom kit is designed to familiarize your students with topics presented in the “Nature Rangers” field trip, and to provide a depth of experience and opportunity to apply knowledge after the trip. The activities within this kit will give your students a better understanding of such topics as **adaptations, community connectivity, human influences, and change over time** using unique artifacts and hands-on exploration. They are designed to build a strong background for the field trip itself, thereby enhancing your students’ outdoor experience.

## How does it work?

We provide different activities that will help students build a more comprehensive understanding of relevant concepts. We recommend that these activities are done in the order that they are presented, for a more comprehensive understanding of relevant concepts. These activities can be adjusted to different age or learning groups; you can omit the included worksheets and focus purely on observational activities, and extensional writing prompts help to further understanding and scientific observational skills.

## Nature Rangers Kit Contents

1. Supplemental Activity Curriculum Descriptions
2. Materials to support curriculum
3. Visual Aids to support curriculum, including photos, diagrams, and worksheets
4. Artifacts to foster hands-on learning such as tree ring cookies, pelts, animal track molds

## List of Activities and Key Concepts Covered

1. **Pogonip Timeline** - *Community connectivity and human influence*  
Students learn the history of Pogonip from first inhabitants to modern time, exploring how people and the environment have been connected and how it has changed.
2. **Bill Nye Rock and Soil DVD** - *Rock cycle and environmental change over time*  
Students learn about the rock cycle and soil types, then follow up with discussion questions.
3. **Pogonip Pandemonium** - *Adaptations and connectivity*  
Students explore animal adaptations and how animals, plants and the environment are connected.
4. **Peek Inside The Bean Seed** - *Adaptations and biology*  
Students observe a bean seed as it starts to grow into a bean plant. **Teachers must provide their own seeds.**
5. **Stuck in the Web of Life** - *Connectivity and web of life*  
Students play an interactive role in the food web using string to explore connectivity and the effects of population on the food web.



**6. Follow The Signs - *Tracking and evidence***

Students learn to identify local animals by studying their tracks.

**7. Tree Cookie Detectives - *Dendrochronology and data collection***

Students learn how to use tree rings to study past growth patterns based on rainfall data.

**8. I Will Survive - *Adaptations and change***

This activity models how generalist species survive changes to their environment better than specialist species.

The Educational Kit includes the visual aids and materials for all activities, unless otherwise noted, and suggestions for extension activities and writing prompts which encourage deeper understanding.

**For a detailed list of NGSS standards that each activity supports please see the Program Overview on the [kit description page](#).**

# Nature Rangers Classroom Presentation

## Why do we provide a classroom presentation?

Our classroom presentations use a combination of powerpoint slides, small group discussion, short activities, and simple games to familiarize your students with topics presented in the “Nature Rangers” field trip. It provides background knowledge for the topics we will be studying at Pogonip and it helps students know what to expect and what to bring on their field trip. The Nature Rangers classroom presentation introduces students to the history of Pogonip. It covers environmental change caused by nature or humans, how this change affects habitats, and introduces students to the three main habitats we will see in Pogonip and some of the plants and animals found in those habitats.

## List of Key Concepts Covered

**Where is Pogonip** - Using maps and photos students will learn more about where Pogonip is located in Santa Cruz.

**Nature is Changing** - Students will do an activity where they look at photos of natural or manmade habitat changes and guess what happened to create the damage observed in the photos. We will end with the concept of succession and observing how nature changes through time and that not all change is bad.

**Pogonip Time Machine** - Students will work in groups to learn more about one point in pogonip history and then present their time period to the class. This activity helps students understand how human use in the past shapes the pogonip environment today.

**The three main ecological communities we will study** - Students will learn about the three ecological communities we will be learning about at Pogonip and how to identify these habitats and their main characteristics.

**Biodiversity Game** - Students will work in groups to learn about which species of plants and animals are found in which of the three habitats we will be studying. They will compare biodiversity between the three habitats

**What do students need** - We go over what students should bring on the trip and give them time to ask questions about the trip.



# Additional Resources

## Virtual Resources:

**Video:- [Intro to Santa Cruz habitats](#)** Teachers may find clips from this 1 hour video useful. Chapters are conveniently marked in the video to make topics easier to find.

**Video:- [Intro to the Santa Cruz Redwoods](#)** Teachers may find clips from this 1 hour video useful.

**Video:- [Intro to the Santa Cruz Coastal Prairies](#)** Teachers may find clips from this 1 hour video useful.

**Activity: [Great Horned Owl Activity](#)** When the sun goes down and we head to bed, a different world is waking up! We may be able to hear some of these creatures of the night “hoo-hoo-ing” to each other as they wake up and we turn inside. How do they live? What special features help them thrive in the dark? Take a closer look at the great horned owl and practice your naturalist skills of making observations and matching form to function.- (Pair this kit with the rental of our [great horned owl specimen](#) and education kit for even more learning)

**Activity: -[Cultivating Nature Awareness](#).-** So much can be revealed to us when we immerse ourselves in our surroundings and give our undivided attention to nature! When we slow down and focus our senses, our awareness deepens and we begin to notice more. Noticing, in turn, leads to connection, familiarity, a desire for stewardship, a sense of place, and so much more. By familiarizing ourselves with nature in this way we can also learn to recognize patterns and relationships that exist all around us. -Combine with the Create [yYour eOwn #Field gGuide](#) activity and [Science Illustration kit](#) to extend the learning further.

**Activity: [Create your own field guide](#) -**Creating a field guide is a great way to become an expert on a location. It is also a great way to share information with others. Choose a location to become an expert on! It can be your backyard, neighborhood, or any other outdoor spot that interests you. Once you have chosen your spot you may choose to focus on plants, animals, or both! Depending on how much time you have and what makes you most excited about learning. Combine with the Cultivating Natural Awareness activity and [Science Illustration kit](#) to extend the learning further.