



# Pacifica's Mobile Nature & Horticulture Center

## "Amazing Adaptations" Four and Five Grade Program Outline

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**Introduction:** Students will review plant and animal groups and how species have special adaptations within their ecosystems. We will also discuss the difference between structural and behavioral adaptations. After the overview, students will visit four stations with their journals. Wrap-up will include a discussion of plant and animal adaptations to forest fires.

### NATURE CENTER STATION OBJECTIVES:

1. To differentiate groups of animals.
2. To explore the ways that animals are adapted to their environment or habitat.

### ACTIVITIES:

#### YELLOW STATION

#### VERTEBRATE CLUES—

1. Students will learn about the five main backbone animals: fish, reptiles, amphibians, birds and mammals and their adaptations.

#### BLUE STATION

#### ADAPATED BODY PARTS—

2. Students will learn about adaptations by looking at animals' parts such as feet, skin/coverings, and beaks of animals. Students will complete matching activities in their journals and explore how cold-blooded animals adapt to temperature change.

### HORTICULTURE CENTER STATION OBJECTIVES:

1. To learn about the parts of a plant.
2. To discuss how plants and seeds have adapted, including seed dispersal and transpiration.

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3. To discuss and implement the steps of scientific inquiry in a simple experiment.

ACTIVITIES:  
RED STATION  
LEAVES—

1. Students will explore the different types of leaves and their characteristics.
  - a. Students will make journal entries about the different characteristics of leaves and how they have adapted.
  - b. Students will learn about insectivorous plants and how they have adapted.

GREEN STATION  
SEEDS—

2. Students will explore how seeds are adapted to disperse and grow.
  - a. Bean seeds will be examined and then placed in a sandwich bag for careful observation and data entry on the journal activity sheet.
    - i. This activity will be completed in the classroom.
  - b. Seeds will be planted for re-vegetation of the Quartz Fire location.

Connections to the Certificate of Initial Mastery (CIM) Standards:  
Nature Center Objectives –

Unifying Concepts and Processes: Understand and apply major concepts and processes common to all sciences.

Common Curriculum Goal: Apply foundation concepts of change, cycle, cause, and effect, energy and matter, evolution, perception, and fundamental entities.

Content Standards: Use concepts and processes of – Systems, order, and organization.  
Leads to or meets Benchmark at Grade 5:

1. Identify interactions among parts of a system.

Content Standards: Use concepts and processes of – Evolution and equilibrium.

Leads to or meets Benchmark at Grade 5:

Organize evidence of a change over time.

1. Student will be able to observe and record change in phenomena for a period of time.
2. Student will be able to sort data and display in a logical sequence.

Common Curriculum Goal: Apply foundation concepts of change, cycle, cause and effect, energy and matter, evolution, perception, and fundamental entities.

Content Standards: Use concepts and processes of – Structure and Function.

Leads to or meets Benchmark at Grade 5:

Describe physical and biological examples of how structure relates to function.

1. Student will be able to identify particular structures in animals with the function they serve. For example, webbed feet perform the function of paddling through the water.
2. Student will be able to relate the structures in plants to their functions. For example, tree trunks are solid and strong, and this enables them to provide support for the tree.

Life Science: Understand structures, functions, and interactions of living organisms and the environment.

Common Curriculum Goal: ORGANISMS – Understand the characteristics, structure, and functions of organisms.

Content Standards: Describe the characteristics, structure, and functions of organisms.

Leads to or meets Benchmark at Grade 5:

Describe basic plant and animal structures and their functions.

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1. Student will be able to associate specific structures with their functions in the survival of the organism. For example, the colorful petals of a flower serve to attract insects, which aid in the reproduction of the plant.
2. Student will be able to correlate specific basic sensory needs with their associated structures. For example, animals may sense danger through their eyes, ears, or nose.
3. Student will be able to draw comparisons between structures that are functionally equivalent in plants and animals. For example, the root system in plants and the circulatory system in animals both serve the function of transporting nutrients to the organism.
4. Student will be able to describe the basic needs of living things.

Life Science: Understand structures, functions, and interactions of living organisms and the environment.

Common Curriculum Goal: DIVERSITY/INTERDEPENDENCE—Understand the relationships among living things and between living things and their environment.

Content Standards: Describe the principles of natural selection and adaptation.

Leads to or meets Benchmark at Grade 5:

Describe how adaptations help an organism survive in its environment.

1. Student will be able to identify how an organism's fur, color, shape, size, etc., adapt to its specific environment.
2. Student will be able to identify how and why unique animal and plant structures and behaviors are adaptive. Examples might include a plant developing thorns for protection from birds and larger herbivores; an octopus copying the color and texture of its surroundings for camouflage; vultures spreading their wings toward the sun to kill bacteria acquired when feeding on carrion
3. Student will be able to describe changes to the environment that have caused some species to become endangered.

Horticulture Center Objectives –

Unifying Concepts and Processes: Understand and apply major concepts and processes common to all sciences.

Common Curriculum Goal: Apply foundation concepts of change, cycle, cause, and effect, energy and matter, evolution, perception, and fundamental entities.

Content Standards: Use concepts and processes of – Systems, order, and organization.

Leads to or meets Benchmark at Grade 5:

1. Identify interactions among parts of a system.

Content Standards: Use concepts and processes of – Evolution and equilibrium.

Leads to or meets Benchmark at Grade 5:

Organize evidence of a change over time.

1. Student will be able to observe and record change in phenomena for a period of time.
2. Student will be able to sort data and display in a logical sequence.

Common Curriculum Goal: Apply foundation concepts of change, cycle, cause and effect, energy and matter, evolution, perception, and fundamental entities.

Content Standards: Use concepts and processes of – Structure and Function.

Leads to or meets Benchmark at Grade 5:

Describe physical and biological examples of how structure relates to function.

3. Student will be able to identify particular structures in animals with the function they serve. For example, webbed feet perform the function of paddling through the water.
4. Student will be able to relate the structures in plants to their functions. For example, tree trunks are solid and strong, and this enables them to provide support for the tree.

Life Science: Understand structures, functions, and interactions of living organisms and the environment.

Common Curriculum Goal: DIVERSITY/INTERDEPENDENCE—Understand the relationships among living things and between living things and their environment.

Content Standards: Describe the principles of natural selection and adaptation.

Leads to or meets Benchmark at Grade 5:

Describe how adaptations help an organism survive in its environment.

1. Student will be able to identify how an organism's fur, color, shape, size, etc., adapt to its specific environment.
5. Student will be able to identify how and why unique animal and plant structures and behaviors are adaptive. Examples might include a plant developing thorns for protection from birds and larger herbivores; an octopus copying the color and texture of its surroundings for camouflage; vultures spreading their wings toward the sun to kill bacteria acquired when feeding on carrion
6. Student will be able to describe changes to the environment that have caused some species to become endangered.

## **Nature Center and Horticulture Center Objectives**

Scientific Inquiry: Use interrelated processes to pose questions and investigate the physical and living world.

Common Curriculum Goal: Formulate and express scientific questions and hypotheses to be investigated.

Content Standard: Formulate and express scientific questions and hypotheses to be investigated.

Leads to or meets Benchmark at Grade 5:

1. Ask questions and make predications that are based on observations and can be explored through simple investigations.
2. Ask questions about objects, and events in the world.
3. Identify questions that can be explored through scientific investigation.

Common Curriculum Goal: Design scientific investigations to address and explain questions and hypotheses.

Content Standard: Design scientific investigations to address or explain questions and hypotheses.

Leads to or meets Benchmark at Grade 5:

Design an investigation to answer questions or check predictions.

1. Student will be able to identify which tools to use for the investigation.
2. Student will be able to use appropriate units of measure for the investigation.
3. Student will be able to recognize reasons for controlling variables.

Common Curriculum Goal: Conduct procedures to collect, organize, and display scientific data.

Content Standard: Conduct procedures to collect, organize, and display scientific data.

Leads to or meets Benchmark at Grade 5:

Collect, organize, and summarize data from investigations.

1. Student will be able to select and use an appropriate organization for data summary.
2. Student will be able to select and use familiar tools, such as magnifiers, thermometers, and rulers, to gather data.
3. Student will be able to recognize how to measure and record simple properties such as temperature, time, distance, volume, and mass.

Common Curriculum Goal: Analyze scientific information to develop and present conclusions.

Content Standard: Analyze scientific information to develop and present conclusions.

Leads to or meets Benchmark at Grade 5:

Analyze, interpret, and summarize the data from investigation.

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1. Student will be able to analyze and interpret data related to the question or hypothesis.
2. Student will be able to explain why the data from one person's investigation might differ from the data of others performing the same investigation.
3. Student will be able to analyze data to determine possible questions for further investigation.

### Pre-Visit Activities:

1. Review background material on plant and animal adaptations. This can be found in this packet along with possible warm-up activities before the visit. Please introduce your students to the theme word for this visit: "Adaptation"—Part of an animal or plant or a behavior that makes it especially suited to live in its habitat.

### Post-Visit Activities:

1. Complete the activities begun in the "Caterpillar":
  - a. Yellow Station: Animal groupings (warm-blooded or cold-blooded).
    - i. Classifications of groups and adaptations for their habitats.
  - b. Blue Station: CopyCat Page for The Vertebrate Grab Game.
  - c. Red Station: Parts of Plants and Their Adaptations worksheet.
  - d. Green Station: Watch my Seed Grow.
    - i. Collect data and make predications and record observations as the seed grows into a plant.

### Optional Post-Visit Extensions:

2. Vertebrate Characteristic Game.
3. "Camouflaged Creatures", from Science Is.
4. Make-a-seed art project. This will extend the concept of how seeds travel and adapt.
5. Directions for a more in-depth experiment in plant leaf transpiration are available.
6. There is information about several possible post-visit activities are in the back pocket of each grade level's folder.