

Rosemont Preserve Grade Level Curriculum Goals K – 8  
(Revised with Next Generation Science Standards – August 2019)

For each grade level, this document lists potential learning activities at the Rosemont Preserve, followed by applicable CA science and social studies standards. The clarification statement (noted in red) that accompanies each science standard is provided by CA's NGSS document and is included here for docent reference.

## Kindergarten

### Learning Activities at the Preserve

- Compare attributes of plants and animals.
- Identify patterns of survival needs for plants and animals.
- Explore how plants and animals can change their environment.
- Identify food and shelter that support local wildlife.
- Contrast natural environment versus human impacts.
- Experience the effects of sunlight on Earth's surface and effects of natural canopies.
- Observe local weather and explore the use of debris basin as local severe wet weather protection.

### Next Generation Science Standards by Topic:

#### **1. K Interdependent Relationships in Ecosystems: Animals, Plants, and Their Environment (Life Science and Earth Science)**

Students who demonstrate understanding can:

- K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive.** [Clarification Statement: Examples of patterns could include that animals need to take in food but plants do not; the different kinds of food needed by different types of animals; the requirement of plants to have light; and, that all living things need water.]
- K-ESS2-2. Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.** [Clarification Statement: Examples of plants and animals changing their environment could include a squirrel digs in the ground to hide its food and tree roots can break concrete.]
- K-ESS3-1. Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live.** [Clarification Statement: Examples of relationships could include that deer eat buds and leaves, therefore, they usually live in forested areas, and grasses need sunlight so they often grow in meadows. Plants, animals, and their surroundings make up a system.]
- K-ESS3-3. Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment.\*** [Clarification Statement: Examples of human impact on the land could

include cutting trees to produce paper and using resources to produce bottles. Examples of solutions could include reusing paper and recycling cans and bottles.]

## 2. K Weather and Climate (Physical Science and Earth Science)

Students who demonstrate understanding can:

- K-PS3-1. Make observations to determine the effect of sunlight on Earth's surface.** [Clarification Statement: Examples of Earth's surface could include sand, soil, rocks, and water] [Assessment Boundary: Assessment of temperature is limited to relative measures such as warmer/cooler.]
- K-PS3-2. Use tools and materials to design and build a structure that will reduce the warming effect of sunlight on an area.\*** [Clarification Statement: Examples of structures could include umbrellas, canopies, and tents that minimize the warming effect of the sun.]
- K-ESS2-1. Use and share observations of local weather conditions to describe patterns over time.** [Clarification Statement: Examples of qualitative observations could include descriptions of the weather (such as sunny, cloudy, rainy, and warm); examples of quantitative observations could include numbers of sunny, windy, and rainy days in a month. Examples of patterns could include that it is usually cooler in the morning than in the afternoon and the number of sunny days versus cloudy days in different months.] [Assessment Boundary: Assessment of quantitative observations limited to whole numbers and relative measures such as warmer/cooler.]
- K-ESS3-2. Ask questions to obtain information about the purpose of weather forecasting to prepare for, and respond to, severe weather.\*** [Clarification Statement: Emphasis is on local forms of severe weather.]

## First Grade

### Learning Activities at the Preserve

- Explore ways local plants and animals survive with periodic water flow, relatively dry climate, chaparral conditions, etc.
- Observe differences in leaves, roots, plant structure, etc. that help plants survive and grow

### Next Generation Science Standards by Topic:

#### 1. Structure, Function, and Information Processing (Life Science)

Students who demonstrate understanding can:

- 1-LS1-1. Use materials to design a solution to a human problem by mimicking how plants and/or animals use their external parts to help them survive, grow, and meet their needs.\*** [Clarification Statement: Examples of human problems that can be solved by mimicking plant or animal solutions could include designing clothing or equipment to protect bicyclists by mimicking turtle shells, acorn shells, and animal scales; stabilizing structures by mimicking animal tails and roots on plants;

keeping out intruders by mimicking thorns on branches and animal quills; and, detecting intruders by mimicking eyes and ears.]

## Second Grade

### Learning Activities at the Preserve

- Correlate plant growth with availability of sunlight and water
- Explore various methods of seed dispersal
- Investigate evidence of animals dispersing seeds by locating and dissecting wildlife scat.
- Observe diversity of plants and animals in local habitat.
- Identify local landforms (mountain, canyon, valley, foothill, watershed, etc.)
- Evaluate the use of debris basin as method for slowing the flow of soil and rocks
- Observe the role of plants in stabilizing slopes

### Next Generation Science Standards by Topic:

#### 1. **Ecosystems: Interactions, Energy, and Dynamics (Life Science)**

Students who demonstrate understanding can:

- 2-LS2-1. Plan and conduct an investigation to determine if plants need sunlight and water to grow. [Assessment Boundary: Assessment is limited to testing one variable at a time.]**
- 2-LS2-2. Develop a simple model that mimics the function of an animal in dispersing seeds or pollinating plants.\***

#### 2. **Biological Evolution: Unity and Diversity (Life Science)**

Students who demonstrate understanding can:

- 2-LS4-1. Make observations of plants and animals to compare the diversity of life in different habitats. [Clarification Statement: Emphasis is on the diversity of living things in each of a variety of different habitats.] [Assessment Boundary: Assessment does not include specific animal and plant names in specific habitats.]**

#### 3. **Earth's Systems: Processes that Shape the Earth**

Students who demonstrate understanding can:

- 2-ESS2-1. Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.\* [Clarification Statement: Examples of solutions could include different designs of dikes and windbreaks to hold back wind and water, and different designs for using shrubs, grass, and trees to hold back the land.]**
- 2-ESS2-2. Develop a model to represent the shapes and kinds of land and bodies of water in an area. [Assessment Boundary: Assessment does not include quantitative scaling in models.]**

## Third Grade

## Learning Activities at the Preserve

- Explore variation in traits among given plant species
- Observe how traits can be impacted by environment (e.g. CA Sage drops leaves in extreme heat)
- Discover traits that aid survival (e.g. Laurel Sumac's resistance to bugs)
- Explore signs of wildlife in local habitat and identify existing resources that support the wildlife
- Identify plant and animal attributes that aid survival in this habitat
- Examine camera traps and its role in studying local wildlife, including behavior such as formation of groups
- Evaluate how any given change in the habitat might affect the plants and wildlife (e.g. rainy year vs dry year, population of apex predators, human use of rat poison, etc.)
- Experience the land and how native peoples used and cared for it

## Next Generation Science Standards by Topic:

### 1. **3 Inheritance and Variation of Traits: Life Cycles and Traits**

Students who demonstrate understanding can:

- 3-LS3-1. Analyze and interpret data to provide evidence that plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.** [Clarification Statement: Patterns are the similarities and differences in traits shared between offspring and their parents, or among siblings. Emphasis is on organisms other than humans.] [Assessment Boundary: Assessment does not include genetic mechanisms of inheritance and prediction of traits. Assessment is limited to non-human examples.]
- 3-LS3-2. Use evidence to support the explanation that traits can be influenced by the environment.** [Clarification Statement: Examples of the environment affecting a trait could include normally tall plants grown with insufficient water are stunted; and, a pet dog that is given too much food and little exercise may become overweight.]
- 3-LS4-2. Use evidence to construct an explanation for how the variations in characteristics among individuals of the same species may provide advantages in surviving, finding mates, and reproducing.** [Clarification Statement: Examples of cause and effect relationships could be plants that have larger thorns than other plants may be less likely to be eaten by predators; and, animals that have better camouflage coloration than other animals may be more likely to survive and therefore more likely to leave offspring.]

### 2. **3 Interdependent Relationships in Ecosystems**

Students who demonstrate understanding can:

- 3-LS2-1. Construct an argument that some animals form groups that help members survive.**

- 3-LS4-3. Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all. [Clarification Statement: Examples of evidence could include needs and characteristics of the organisms and habitats involved. The organisms and their habitat make up a system in which the parts depend on each other.]**
- 3-LS4-4. Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change.\* [Clarification Statement: Examples of environmental changes could include changes in land characteristics, water distribution, temperature, food, and other organisms.] [Assessment Boundary: Assessment is limited to a single environmental change. Assessment does not include the greenhouse effect or climate change.]**

### CA Social Studies Standards

3.2 Students describe the American Indian nations in their local region long ago and in the recent past.

1. Describe national identities, religious beliefs, customs, and various folklore traditions.
2. Discuss the ways in which physical geography, including climate, influenced how the local Indian nations adapted to their natural environment (e.g., how they obtained food, clothing, tools).

Resources:
Environmental Education Initiative (EEI) Curriculum - CA Indian People: Exploring Tribal Regions <a href="http://www.californiaeei.org/Curriculum/default.htm">http://www.californiaeei.org/Curriculum/default.htm</a> Password = teacheei

## Fourth Grade

### Learning Activities at the Preserve

- Observe plant structures that support survival (thorns, fuzzy leaves, size of roots, etc.)
- Examine the use of camera traps to study how animals use their external and internal structures to survive
- Identify local landforms (mountain, canyon, valley, foothill, watershed, etc.)
- Discover evidence of changing landscape over time (e.g. streambed, canyon formation, rock layers, etc.)
- Explore signs of weathering (slopes, rocks, sand, purpose of debris basin, etc.) and the impact on humans.
- Discover different types of rocks (rock cycle)
- Examine engineered solutions that stabilize slopes to protect houses built on them.
- Experience the land and how native peoples used and cared for it

Next Generation Science Standards by Topic:

1. **4 Structure, Function, and Information Processing**

Students who demonstrate understanding can:

- 4-LS1-1. Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.** [Clarification Statement: Examples of structures could include thorns, stems, roots, colored petals, heart, stomach, lung, brain, and skin. **\*\*Each structure has specific functions within its associated system.**] [Assessment Boundary: Assessment is limited to macroscopic structures within plant and animal systems.]
- 4-LS1-2. Use a model to describe that animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.** [Clarification Statement: Emphasis is on systems of information transfer.] [Assessment Boundary: Assessment does not include the mechanisms by which the brain stores and recalls information or the mechanisms of how sensory receptors function.]

2. **4 Earth's Systems: Processes that Shape the Earth**

Students who demonstrate understanding can:

- 4-ESS1-1. Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.** [Clarification Statement: Examples of evidence from patterns could include rock layers with marine shell fossils above rock layers with plant fossils and no shells, indicating a change from land to water over time; and, a canyon with different rock layers in the walls and a river in the bottom, indicating that over time a river cut through the rock.] [Assessment Boundary: Assessment does not include specific knowledge of the mechanism of rock formation or memorization of specific rock formations and layers. Assessment is limited to relative time.]
- 4-ESS2-1. Make observations and/or measurements to provide evidence of the effects of weathering or the rate of erosion by water, ice, wind, or vegetation.** [Clarification Statement: Examples of variables to test could include angle of slope in the downhill movement of water, amount of vegetation, speed of wind, relative rate of deposition, cycles of freezing and thawing of water, cycles of heating and cooling, and volume of water flow.] [Assessment Boundary: Assessment is limited to a single form of weathering or erosion.]
- 4-ESS3-2. Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.\*** [Clarification Statement: Examples of solutions could include designing an earthquake resistant building and improving monitoring of volcanic activity.] [Assessment Boundary: Assessment is limited to earthquakes, floods, tsunamis, and volcanic eruptions.]

## CA Social Studies Standards

### **4.2 Students describe the social, political, cultural, and economic life and interactions among people of California from the pre-Columbian societies to the Spanish mission and Mexican rancho periods.**

1. 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.

## Fifth Grade

### Learning Activities at the Preserve

- Identify the relationships among plants, animals, decomposers, and the environment to examine the movement of matter (e.g. food web within this habitat)

### Next Generation Science Standards by Topic:

#### **1. 5 Matter and Energy in Organisms and Ecosystems**

Students who demonstrate understanding can:

- 5-PS3-1. Use models to describe that energy in animals' food (used for body repair, growth, motion, and to maintain body warmth) was once energy from the sun. [Clarification Statement: Examples of models could include diagrams, and flow charts.]**
- 5-LS1-1. Support an argument that plants get the materials they need for growth chiefly from air and water. [Clarification Statement: Emphasis is on the idea that plant matter comes mostly from air and water, not from the soil.]**
- 5-LS2-1. Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment. [Clarification Statement: Emphasis is on the idea that matter that is not food (air, water, decomposed materials in soil) is changed by plants into matter that is food. Examples of systems could include organisms, ecosystems, and the Earth.] [Assessment Boundary: Assessment does not include molecular explanations.]**

## Grades 6-8

### Learning Activities at the Preserve

- Observe specialized plant structures of native species
- Discover signs of characteristic behaviors of local wildlife (e.g. camera trap studies, tracking, etc.)
- Evaluate how changes in environmental factors such as seasonal water flow effect local plants and wildlife.

- Identify the impact of human development on local plants and wildlife
- Explore the concept of wildlife corridors to mitigate human impact.
- Plate tectonics: San Andreas and local faults
- Shaping earth's surface – relevant vocabulary: erosion, deposition, sediment, weathering, landslide, watershed, arroyo
- Types of rock – metamorphic, igneous, sedimentary

Next Generation Science Standards by Topic:

1. **MS Growth, Development, and Reproduction of Organisms**

Students who demonstrate understanding can:

**MS-LS1-4. Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively.** [Clarification Statement: Examples of behaviors that affect the probability of animal reproduction could include nest building to protect young from cold, herding of animals to protect young from predators, and vocalization of animals and colorful plumage to attract mates for breeding. Examples of animal behaviors that affect the probability of plant reproduction could include transferring pollen or seeds, and creating conditions for seed germination and growth. Examples of plant structures could include bright flowers attracting butterflies that transfer pollen, flower nectar and odors that attract insects that transfer pollen, and hard shells on nuts that squirrels bury.]

**MS-LS1-5. Construct a scientific explanation based on evidence for how environmental and genetic factors influence the growth of organisms.** [Clarification Statement: Examples of local environmental conditions could include availability of food, light, space, and water. Examples of genetic factors could include large breed cattle and species of grass affecting growth of organisms. Examples of evidence could include drought decreasing plant growth, fertilizer increasing plant growth, different varieties of plant seeds growing at different rates in different conditions, and fish growing larger in large ponds than they do in small ponds.] [Assessment Boundary: Assessment does not include genetic mechanisms, gene regulation, or biochemical processes.]

2. **MS Human Impacts**

Students who demonstrate understanding can:

**MS-ESS3-3. Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment.\*** [Clarification Statement: Examples of the design process include examining human environmental impacts, assessing the kinds of solutions that are feasible, and designing and evaluating solutions that could reduce that impact. Examples of human impacts can include water usage (such as the withdrawal of water from streams and aquifers or the construction of dams

and levees), land usage (such as urban development, agriculture, or the removal of wetlands), and pollution (such as of the air, water, or land).]

### 3. MS History of Earth

Students who demonstrate understanding can:

**MS-ESS2-2. Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.** [Clarification Statement: Emphasis is on how processes change Earth's surface at time and spatial scales that can be large (such as slow plate motions or the uplift of large mountain ranges) or small (such as rapid landslides or microscopic geochemical reactions), and how many geoscience processes (such as earthquakes, volcanoes, and meteor impacts) usually behave gradually but are punctuated by catastrophic events. Examples of geoscience processes include surface weathering and deposition by the movements of water, ice, and wind. Emphasis is on geoscience processes that shape local geographic features, where appropriate.]