

Habitat Hike

Life Sciences

Grade 3

Focus: Introduction to Biodiversity and Healthy Habitats

NGSS & Environmental Principals

Relation to Program

Disciplinary Core Idea (DCI)

LS1.A Structure & Function: Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction. (3-LS1-1)

LS1.C Organization of Matter and Energy Flow in Organisms: Food provides animals with the materials they need for body repair and growth and the energy they need to maintain body warmth and for motion. Plants acquire their material for growth chiefly from air and water. (3-LS1-1)

LS2.A Interdependent Relationships in Ecosystems: The food of almost any kind of animal can be traced back to plants. Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as “decomposers”. Decomposition eventually restores (recycles) some materials back to the soil. Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life. Newly introduced species can damage. (3-LS2-1)

LS2.C Ecosystem Dynamics, Functioning, and Resilience: When the environment changes in ways that affects a place’s physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die. (3-LS2-1)

LS4.C Adaptation: For any particular environment, some kinds of organisms survive well, some survive

During the walk, students will be introduced to the Garden’s many habitats. They will be encouraged to observe the different characteristics found in each habitat and how the organisms within them are affected by these traits.

Students will learn that all living things are connected by a food web. Species of insects and invertebrates act as decomposers and break down nutrients from dead organisms and release it back into the soil. Plants uptake these nutrients and pass them to the animals that feed upon them. When these organisms die, their nutrients are returned to the soil through decomposers and the cycle begins again. Students will be prompted to think about what happens to the species within a habitat if one or multiple events cause the creek –or any environment –to change (e.g. fire, mudslides, deforestation)? Questions, observations, discussion and investigation will lead students to the conclusion that –over time –some species would thrive in the new environment, others would suffer and some would completely disappear and because everything is interconnected, organisms who are not directly affected by the change may still experience indirect effects. As a result, ecosystems with greater biodiversity and more complex food webs are less likely to collapse if an organism disappears since they have other organisms supporting them.

Throughout their walk, students will observe how changes plants and animals make to their environment to survive (e.g. build nests, make burrows, overgrow landscapes) can inadvertently alter the ecosystem. Docents will prompt students to think of examples of any human activity that could dramatically change a landscape. Students will be reminded that animals – including humans –rely on plants for food and services (e.g. shelter, wood, oxygen) and without them our

less well, and some cannot survive at all. (3-LS4-1)

way of life would dramatically change.

LS4.D Biodiversity and Humans: Populations live in a variety of habitats, and change in those habitats affects the organisms living there. (3-LS4-1)

ESS2.E Biogeology: Living things affect the physical characteristics of their regions. (3-ESS2-1)

Crosscutting Concepts (CCC)

Patterns: Observed patterns in nature guide organization and classification and prompt questions about relationships and causes underlying them.

- Similarities and differences in patterns can be used to sort, classify, communicate and analyze simple rates of change for natural phenomena and designed products.
- Patterns can be used as evidence to support an explanation.

Cause and Effect: Events have causes, sometimes simple, sometimes multifaceted. Deciphering causal relationships, and the mechanisms by which they are mediated, is a major activity of science and engineering.

- Cause and effect relationships are routinely identified, tested, and used to explain change.
- Events that occur together with regularity might or might not be a cause and effect relationship.

Energy & Matter: Energy can be transferred in various ways and between objects.

Structure & Function: The way an object is shaped or structured determines many of its properties and functions.

- Different materials have different substructures, which can sometimes be observed.
- Substructures have shapes and parts that serve functions.

Stability and Change: For both designed and natural systems, conditions that affect stability and factors that control rates of change are elements to consider and understand.

- Change is measured in terms of differences over time and may occur at different rates.
- Some systems appear stable, but over long periods of time will eventually change.

During the walk, students are reminded that life in an ecosystem is connected in a cycle. Energy and nutrients transfer through the food web as organisms consume one another and decomposers break their bodies down back into the soil. Students will be able to recognize the reemerging pattern that plants and animals depend on the health of their habitat to survive and that the demise of one species can lead to the fall of another.

As students observe that plant characteristics vary between different habitats and ecosystems, they will discover that environments can affect the physical traits of an organism in order to help them survive better within it. When a change happens in the habitat, some organisms may thrive in the new environment while others suffer.

Science & Engineering Practices (SEP)

Asking Questions and Defining Problems: Asking questions and defining problems in grades 3-5 builds from grades K-2 experiences and progresses to specifying qualitative relationships.

- Ask questions about what would happen if a variable is changed.
- Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships.
- Use prior knowledge to describe problems that can be solved.

Planning and Carrying Out Investigations: Planning and carrying out investigations to answer questions or test solutions to problems in 3-5 builds on K-2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or designed solutions.

- Make observations and/or measurements to produce data to serve as the basis of evidence for an explanation of a phenomenon or test a designed solution.
- Make predictions about what would happen if a variable changes.

Engaging in Argument from Evidence: Engaging in argument from evidence in 4-5 builds on K-2 experiences and progresses to critiquing the scientific explanations or solutions proposed by peers by citing relevant evidence about the natural and designed world(s).

- Construct an argument with evidence, data, and/or a model

During the walk, students are encouraged to ask questions about their surroundings and why things are occurring in nature. These inquiries will lead to observations and investigations in the pursuit of answering these questions. Afterwards, students will use their findings to describe patterns that reoccur throughout the Garden and make predictions on an explanation of a phenomenon.

After the tour, students will have the relevant evidence to support an argument on how environments can affect organisms and vice versa.

Performance Expectations (PE)

3-LS3-2 Heredity: Inheritance and Variation of Traits: Use evidence to support the explanation that traits can be influenced by the environment.

3-LS4-2 Biological Evolution: Unity and Diversity: 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.

On the walk students will observe plants vary in characteristics between different habitats. Students will be presented with numerous examples of traits between species and see how these differences can greatly affect an organism's chance of survival within specific habitats. Once presented with these examples, students will receive explanations on how the living conditions of the environment can lead to the formation of these traits.

3-LS4-3 Biological Evolution: Unity and Diversity:

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.

After this program, students will have the relevant evidence to construct an argument that a plant's traits were at least partially influenced by the specific conditions of its environment, even small changes within the same species can lead to differences in their ability to survive, and if there is a change in an environment some species would thrive in the new conditions, others would suffer and some would completely disappear.

California's Environmental Principle(s) & Concept(s)

Principle I: The continuation and health of individual human lives and of human communities and societies depend on the health of the natural systems that provide essential goods and ecosystem services.

- **Concept a:** Goods produced by natural systems are essential to human life and to the functioning of our economies and cultures.
- **Concept b:** Ecosystem services provided by natural systems are essential to human life and to the functioning of our economies and cultures.

Principle III: Natural systems proceed through cycles that humans depend upon, benefit from, and can alter.

- **Concept a:** Natural systems proceed through cycles and processes that are required for their functioning.
- **Concept b:** Human practices depend upon and benefit from the cycles and processes that operate within natural systems.
- **Concept c:** Human practices can alter the cycles and processes that operate within natural systems.

On the walk students are encouraged to make assumptions based on their observations about how the health of the ecosystems within the Garden will affect the health of its plants and animals. From habitat to habitat, students will see how the animals within them rely on plants for food which, in turn, rely on the water and nutrients from the creek.

Students are shown through examples how the condition of an environment affects the organisms living in it. As students come to understand these changes in the environment can alter natural cycles and lead to the prosperity, hardship, and demise of different organisms they will be prompted to wonder if human practices ever alter habitats. By the end of the tour, students will realize that human changes to an environment can have just as much of an effect as natural alterations do. Students will be reminded how humans depend on plants, animals, and natural cycles for resources and food and that these changes will have consequences on our way of life.

CA CCSS, ELA/ELD & Math

SL.3.1: Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 3 topics and texts, building on others' ideas and expressing their own clearly.

- Ask questions to check understanding of information presented, stay on topic, and link their comments to the remarks of others.
- Explain their own ideas and understanding in light of the discussion.

During the tour, students are engaged through inquiry-based learning and encouraged to ask why something is a certain way. These questions will lead to group investigation and discussion towards the discovery of the reason.

After this program, students will have the relevant evidence to describe plants' external structures, how they relate to their survival, how and why these parts may change over time, how organisms are

SL.3.3: Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.

W.3.1: Write opinion pieces on topics or texts, supporting a point of view with reasons.

W.3.2: Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

interconnected with themselves and their environment, and how humans rely on plants and natural systems in order to live.