



PROJECT 1: Whose Bug Is It Anyway?

Level: Kindergarten

Subject: Science

The following project covers several interdependent Next Generation Science Standards (California) related to Ecosystems: Animals, Plants, and Their Environment in Kindergarten. In this project, kindergarteners are being asked their opinion on whether local gardeners should introduce invasive species as a means of protecting gardens from pests. Students spend a significant amount of time understanding the similarities and differences among animals, plants, and their environment as they relate to energy consumption. Students also explore human interactions with the environment and how such interactions dramatically influence local and global environments. Students have targeted surface-, deep-, and transfer-level tasks and workshops that enable them to build a solid foundation of scientific understanding. The conclusion of the project has students explore overfishing and how such human actions disrupt energy consumption. The new context focuses on the relationships of animals, plants, environments, and humans; but it also provides a new perspective on intentionally removing species from an environment rather than introducing a new species to an environment.

Key Standards

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.]

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PHASE 1	PHASE 2	PHASE 3	PHASE 4
<ul style="list-style-type: none"> • Launch project. • Conduct pre/post assessment. • Go through Know/Need to Know list. 	<ul style="list-style-type: none"> • Engage in surface workshops. • Begin completing major tasks at surface level. 	<ul style="list-style-type: none"> • Engage in deep learning workshops. • Postassessment • Begin completing major tasks at deep level. 	<ul style="list-style-type: none"> • Presentation • Reflection • Provide new context for students to discuss.

PROJECT DESIGN

STEP 1: Learning Intention(s)

- **Learning Intention (1):** I can tell others why plants and animals change their environment to survive.
- **Learning Intention (2):** I can show others why plants and animals live in different environments.
- **Learning Intention (3):** I can tell others how humans can improve the local environment, which they sometimes hurt.

STEP 2: Success Criteria

Surface	Deep	Transfer
<ul style="list-style-type: none"> • Define <i>plant, animal, and environment</i>. • List examples of human impact. 	<ul style="list-style-type: none"> • Relate animals and plants to their needs (e.g., energy needs). • Relate animals and plants to different environments. • Relate human impacts to animals and plants. 	<ul style="list-style-type: none"> • Design a solution to a human-caused issue that will improve the local and global environment.

STEP 3: Driving Question(s)

- How do humans improve their local and global environment to prevent the loss of animals and plants? [in your neighbor's garden]?
- Context
- Invasive species (in our gardens)–insects, plants–bamboo
 - Overfishing
 - Plastic bottles
 - Litter
 - Reintroduction of a species
 - Global warming

STEP 4: Tasks

Surface	Deep	Transfer
<ul style="list-style-type: none"> • Label key images. 	<ul style="list-style-type: none"> • Design a visual diagram that illustrates the relationships among plants, animals, and humans. 	<ul style="list-style-type: none"> • Select one of these problems, then present a solution to adults using text and visuals.

STEP 5: Entry Event

- Scenario . . . Local gardeners want to use insects to control pests.
- Expectations . . . Present a solution that includes reasons for finding native solutions to biocontrol issues.
- Patrons . . . Local gardeners (parents, community members, staff)
- Format . . . Public presentation to adults (with accompanying resources–visuals)

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WORKSHOPS		
Surface	Deep	Transfer
<ul style="list-style-type: none"> Classification of animals, plants, and environments (four workshops reviewing animals, plants, and environments) using a jigsaw method Read fiction and nonfiction selections on gardens. 	<ul style="list-style-type: none"> Draw relationships between animals and plants using nonlinguistic representation (Students will have multiple images that they must categorize to demonstrate relationships.) Perspective analysis on human involvement with the local and global environment. 	<ul style="list-style-type: none"> Compare and contrast problems between overfishing (orange roughy) and our local garden.

PROJECT CALENDAR					
	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1 [Phase 1 and Phase 2]	Project launch (Local gardeners discuss biocontrol issue; include key “breadcrumbs.”) Start with aphids and ladybugs. Preassessment (oral assessment) Students go through a Know/Need to Know process.	Surface workshops (How do we classify animals, plants, and environments?)	Surface Animals Reading workshop—nonfiction	Surface Plants Reading workshop—fiction	Surface Environment
Week 2 [Phase 2 and Phase 3]	Review Know/Need to Know list. Meet with local gardeners to discuss how plants and animals intersect in the garden. Watch a video clip on animals and plants in other environments.	Deeper workshop Relationships. Nonlinguistic representation workshop	Deeper workshops Visit the garden. Take observations and then check on categorization from previous workshop.	Deeper workshop Perspective analysis	Reading workshop—nonfiction
Week 3 [Phase 3 and Phase 4]	Postassessment review Know/Need to Know list	Prepare for presentations. Critical Friends Team review	Present bio control solutions to local gardeners.	Transfer workshop How do we address overfishing (orange roughy)? How is this problem similar to our garden problem? How does it differ?	Reflections

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