

POWERHOUSE SCIENCE CENTER

3615 Auburn Blvd., Sacramento 95821 (916) 674-5000

Topics

Biology and Ecology

Grades

K-2

Duration

60 minutes

Vocabulary

biology, ecology,
observation, ecosystem,
organism, food chain,
carnivore, herbivore,
omnivore

Next Generation

Science Standards

Practices

Analyzing & Interpreting
Data

Core Ideas

LS1.C: Organization for
Matter and Energy Flow in
Organisms

LS1.A: Structure & Function

LS4.D: Biodiversity &
Humans

Crosscutting Concepts

Patterns

Performance Expectations

K-LS1-1: Use observations to
describe patterns of what
plants and animals
(including humans) need to
survive.

Eco Explorers

Overview

The Eco Explorers program allows students the opportunity to explore the natural space around Powerhouse and the possibility of observing a variety of organisms living in an ecosystem. By keeping track of the organisms they observe, students will be honing their data collecting skills. To wrap up the program students will share their findings and learn about some interesting facts about the organisms they observed.

Objectives

- Practice scientific observation and data collection.
- Spend time outside a classroom in a natural space.
- Learn what an organism is and how it plays its part in an ecosystem.
- Share information with classmates, and listen to what their classmates share.

Teacher Preparation

- If time allows during normal lessons, introduce students to some of the vocabulary to be used in the program.
- Arrive 15 minutes before start time to allow time for check in.
- Have students divided into groups of 4-6 to allow a quicker start to the program.
- If possible, have chaperons assigned to groups of students to explore the grounds with as a team.

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Vocabulary

Biology: the study of living organisms

Ecology: the branch of biology that deals with the relations of organisms to one another and to their physical surroundings

Observation: the action or process of observing something or someone carefully or in order to gain information

Ecosystem: a biological community of interacting organisms and their physical environment

Organism: an individual animal, plant, or single-celled life form

Food Chain: a hierarchical series of organisms each dependent on the next as a source of food

Carnivore: an animal that feeds on flesh/meat

Herbivore: an animal that feeds on plants

Omnivore: an animal that eats food of both plant and animal origin

Eco Explorers

Extended Learning Activity

Food Chain

Organisms that live together in an ecosystem play important roles in each other's survival. Sometimes that role is to provide food. For plants and animals that could mean they are food! In this activity students will create a food chain to show the connections between the organisms in an ecosystem.

The types of organisms in a food web can be broken into 5 groups: Producers, Consumers, Secondary Consumers, Top Predators, and Decomposers. Below are brief descriptions of each group;

Producers: organisms that make their own food (by converting sunlight through photosynthesis). *Some examples are: trees, flowers, grass, and other plants.*

Consumers: organisms that eat the food produced by others and sometimes decomposers. *Some examples are: deer, rodents, small birds, frogs, and insects.*

Secondary Consumers: organisms that eat the smaller consumers (mostly herbivores). *Some examples are: lizards, birds of prey, medium sized rodents, and snakes.*

Top Predators: organisms that consume producers as well as consumers. An organism in this group is often a carnivore or omnivore. *Some examples are: wolves, bears, tigers, and coyotes.*

Decomposers: organisms that consume and break down dead organisms and return nutrients to soil. These organisms provide food for producers as well as other consumers. *Some examples are: fungi, worms, insects, and scavengers.*

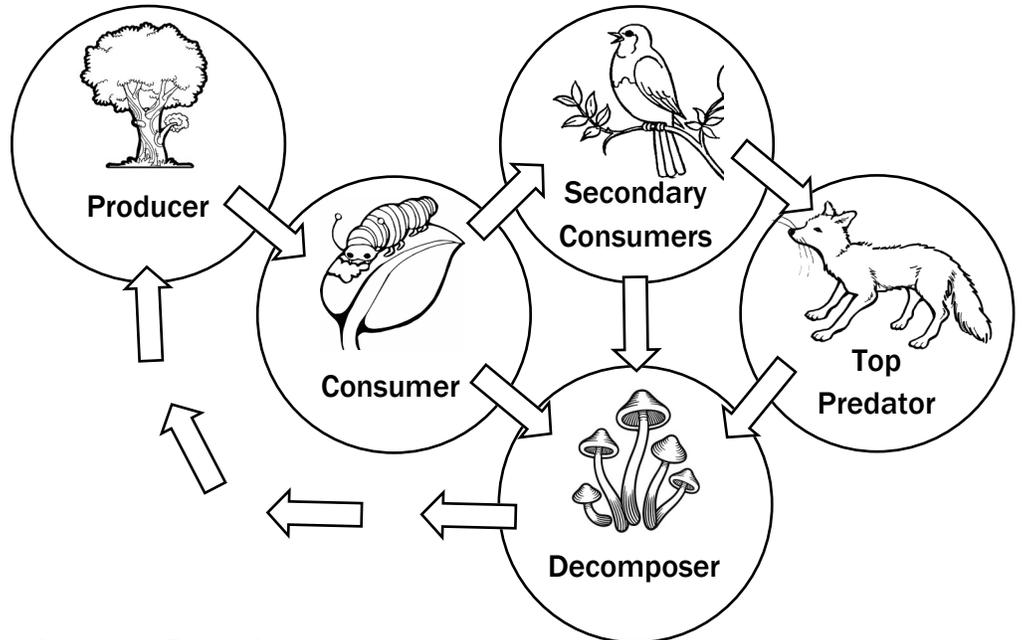
In a food chain each of the 5 groups of organism is represented. In an ecosystem many different food chains come together to create a web. Sometimes in food webs more than one consumer connects with another.

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Eco Explorers

Extended Learning Activity (Cont.)



Interesting Fact:

Hippocrates and Aristotle were among the first recorded scientists to write down their observations on what would be considered ecology.

Did you know?

Trees are the longest living organisms on Earth, and never die of old age.

Quote:

“The more clearly we can focus our attention on the wonders and realities of the universe about us, the less taste we shall have for destruction.”

- Rachel Carson

Alternate Procedure:

- Divide the class into groups of 5. Each group member is in charge of one of the 5 groups in a food chain. Have each member create an organism with in their classification. Once finished each group can display their food chain on the walls of the classroom, connecting each organism to the next with yarn or string.
- Instead of dividing the class into small groups of 5 students, divide the class into 5 larger groups. Like the previous alteration each group is responsible for an organism in each of the 5 classifications.
- For younger students, use the attached images to create a food chain using a traced hand. Each finger represent an organism, from the producer on the pinky to the decomposer on the thumb.

Resources

<https://www.nature.com/scitable/knowledge/library/food-web-concept-and-applications-84077181>

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Eco Explorers

Extended Learning Activity

Tortoise Game

When there is a change in an ecosystem it affects more than one organism. Things like human made structures, changes in the temperature or water supply or extinction of a group of organisms can effect a whole ecosystem.

The organisms in a desert ecosystem have adapted to live in this harsh environment. One of these organisms is the desert tortoise. In this physical activity students will be tortoises trying to survive in their changing ecosystem.

To play the tortoise game first mark out an area of the classroom, grass field, or multipurpose space to be the ecosystem. In the ecosystem place mark out shelters for the tortoises. They can be tapped circles on the ground, hula hoops, or carpet squares.

Explain to the students they will be the tortoises living in this ecosystem, and because they are tortoises they must move like a tortoise (slowly on their hands and knees).

The game plays like musical chairs, with each tortoise moving around the space while music plays. As soon as the music stops, they must find shelter. As the game continues shelters can be removed in several ways:

Construction: Things humans build can cause problems in ecosystems if not planned out properly. Using a jump rope or fabric divide the playing space. Explain that a road has been built that cannot be crossed by tortoises.

Change in the Weather: With a change in the climate temperature changes can effect ecosystems. Remove 2 or 3 shelters from the game explaining that because of floods or high temperature shelter is scarce.

***Extinction:** If an organism that provides food for another can no longer survive in the ecosystem it can make it hard for that organism to find food. Have the remaining players play rock paper scissors to determine who survives.

Other alterations to the game are welcome. Gage how detailed you think they need to be in relation to your class. After playing a few rounds, talk about what it was like playing the game. Ask the class to think about how organisms live in their ecosystem. If all of the organisms are effecting each other in an ecosystem, what can we do to make sure we aren't effecting it negatively?

Did you know?

All major ecosystems derive the energy that supports life from plants. Plants convert sunlight, water and carbon dioxide from the air into carbohydrates such as starches and sugars. They are the primary producers of an ecosystem.

Quote:

"Each species on our planet plays a role in the healthy functioning of natural ecosystems, on which humans depend".

- William H. Schlesinger

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