

Environments: Beetles in the Garden

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Science Objective

The interdependent web of life is very apparent as children learn all about ecosystems and living environments. Each environment has different needs and life forms, including plants and animals. Children will learn about types of ecosystems and what they need to maintain equilibrium. They will also understand that changes can result in unforeseen consequences. This knowledge is very important in understanding the fragility of ecosystems.

iScience Puzzle: Beetles in the Garden

Faced with a problem in which beetles have devoured roses in a garden, children must determine the best course of action to take. Each strategy has pros and cons, making the solution a difficult choice. Children learn that a change in an environment can have many consequences.

Objectives ► Children will:

- learn why environments need stability.
- understand that all life forms need food, water, and air.
- define the meaning of ecosystem.
- describe different types of ecosystems.
- explain how climates affect ecosystems.
- describe the effects of plants, animals, and humans on an ecosystem.
- understand that a change in an ecosystem affects the ecosystem's equilibrium.
- describe the water cycle.

Materials

- small non-native plant

Lesson Plan

Before Reading

Investigation

Display a small plant, preferably one that is not local to your area. Ask: *What does this plant need to stay healthy? What would happen if I planted it outside? Would it live in this environment?*

Have children describe how they have cared for a vegetable garden, or remind children of a story or folktale about animals that eat plants, such as the story of Peter Rabbit. Relate this to what happens when rabbits eat vegetables that a farmer is growing. Ask: *How do animals affect plants? What else can affect how well plants grow?*

Explain that children will examine different environments and discover how they are alike and different. They will also learn that ecosystems are fragile and that there are many factors that affect their stability and growth.

Science Concepts

Accessing prior knowledge gets students thinking about the topic.

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During Reading

Investigation

pp. 6–7: Discuss the alternatives and the questions on page 7. Ask children to vote for the different solutions and tally them on the board. Tell them that their choices may change as they continue reading.

pp. 10–11: Create a word web on the board about the environment in which the children live. Have children fill in outer circles with information about the climate, types of plants and animals, and human activity.

pp. 12–16: To explain the differences among a habitat, an ecosystem, and a biome, choose an animal that lives in your area, such as a rabbit or a prairie dog. Then, starting in an inner circle and moving outward in concentric circles, list with children some descriptive details about its habitat, ecosystem, and biome.

pp. 18–19: Discuss some producers and consumers in your region. Ask: *What fruits and vegetables grow in our area? Are there pests that eat them?*

Science Concepts

Scientific thinking processes help build explanations for scientific observations.

An environment includes all living and nonliving forms.

Plants, animals, and humans require specific environmental conditions to live and grow.

All organisms require food, air, water, and space to live. All organisms are interdependent.

During Reading (continued)

Investigation

Science Concepts

p. 21: You may want to research and bring in examples of what has happened when insects or other animals have been introduced to an environment.

Research skills are tremendously important in science.

p. 23: Put this information into a cause-and-effect graphic organizer.

Life forms in an ecosystem are interconnected. The health of one life form can result in harmful changes to another life form.

p. 27: Review the choices children made at the start of this book. Ask: *Should we take another tally of choices now? Do you still think your choice is the best one? Why or why not?*

Scientific thinking processes help build explanations for scientific observations.

p. 29: If possible, display a topographic map of your region. Help children identify where their water comes from. Ask: *How does water affect our environment? Does it affect the type of plants that grow?*

All living things depend on water to live.

p. 31: Ask: *Why are leaves so important to plants?*

Photosynthesis is the process by which plants convert sunlight into energy for food.

pp. 32–34: Discuss the concept of change. Ask: *Are all changes to an environment bad? After a forest fire, the forest changes and grows into a different forest. Is this a bad thing? Why or why not?*

Complex systems change over time.

pp. 34–41: List the threats to the stability of the environment in a word web on the board. Encourage discussion about the need to protect environments from human activity.

Humans can change the environment in many ways and cause stress.

pp. 42–43: Refer back to choices children made at the beginning of this book. Have children vote again and explain their choices.

Scientific thinking processes help build explanations for scientific observations.

p. 44: Look up invasive species in your area on the Internet. If possible, bring in some examples of non-native plants that have had a negative effect on local plants.

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After Reading

Restate the key ideas in the book. All life forms live in environments to which they have adapted. Environments include habitats, ecosystems, and biomes, which have specific climates, soil, and sources of water. Plants and animals in every environment affect its health and stability; changes caused by weather, pollution, introduction of new species, and human activity can upset the equilibrium and result in stress to organisms. Encourage children to relate this information to the area in which they live.

Investigation

Bring children on a walk through the schoolyard or local park. Have them identify the features of this environment. Identify any invasive plants. Ask: *What is healthy about this environment? How could it be improved?*

Have children research an animal in their region and answer questions such as: *What is its habitat? What does it eat? How does it depend on plants and animals that live around it? What would happen if the climate changed or if its food source decreased?*

Discuss the interdependence of people and the environment by connecting to social studies. *Why did people settle in certain areas? How did they change the environment?* Consider, for example, towns that were built on rivers that supplied energy and what happened when the industries died out.

Understanding Science

All living things affect the other living things around them, sometimes positively, sometimes negatively.

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Like all other living things, humans need water to live. They affect their environment in both positive and negative ways.