



## Ecosystem ABCs

### Connected Next Generation Science Standards

**3-LS4-3** Construct an argument with evidence that in a particular habitat some organisms can survive well, some less well, and some cannot survive at all.

**5-LS2-1** Develop a model to describe the movement among plants, animals, and decomposers, and the environment.

### Featured Science and Engineering Practices

Developing and Using Models

### Featured Cross-Cutting Concepts

Patterns

Before the lesson, students should have a working definition of organism, observation, and evidence.

### Overview

In this introduction to ecosystems lesson, students are encouraged to use evidence to find living and nonliving things in the school garden ecosystem. They will look beyond the trees and produce to discover the huge variety of life in the schoolyard. This lesson is intended to serve as a precursor for creating ecosystem models and understanding the movement of matter within an ecosystem.

### Students will

- Identify and describe living and non-living things in the garden.
- Search for evidence of plants and animals in the garden.
- Classify parts of the ecosystem into living and nonliving or biotic and abiotic.
- Argue what makes something living or non-living.

### Teacher Preparation

- Walk through the garden to familiarize yourself with the space. Notice any evidence of animal or plant species that are unfamiliar to students.
- Optional: Obtain seed catalogs or field guides to help students identify garden plants.

**Guiding Question - How do scientists categorize the different parts of the garden (ecosystem)?**



## Ecosystem ABCs

### Materials

- Teacher - small whiteboard, chalkboard, or poster-board
- Garden notebooks or worksheets and clipboards
- Pencil
- Optional - seed catalogs, field guides, and magnifying glasses

### Settings

- School garden or green space
- Can be taught at any time of year but when the garden is dormant, you may want to have a discussion about why there is less evidence of animals

### Explore

- On your way out to the garden, ask students, What kind of plants or animals do they think they will find in the garden today and why?
- Popcorn answers around the group once you are in the garden.
- In the garden, introduce the guiding question. The students are going to create a giant list of all the parts of the garden to answer this question. When scientists first visit a place, they have to identify what is in it! They will be acting as a scientist by finding, observing, and eventually categorizing
- Will some things in the garden be hard to find? Not all animals are easy to spot, so students will have to look for clues and evidence that certain animals live in the garden.
- Create a definition of evidence with students.
- When was a time you found evidence? What did you do? How did you know what it was evidence of? Emphasize that evidence comes from observations using their five senses.
- For animals that might be hard to see, what kind of evidence of animals could they find? Have students turn and talk with a partner and then the group. Guide students to include evidence like chewed holes in leaves, webs, eggs, burrows in the soil, etc.
- Explain that they are going to explore the garden with a partner to create a list of as many different things they find in the garden. The list can include anything they observe - plants, animals, people-created stuff, non-living things, and evidence of animals.



## Ecosystem ABCs

Instead of creating a list, students can collect samples of what they find in the garden.

- If students get stuck on one type of object, encourage them to explore other parts of the garden. If they do not know the name of something, encourage them to write a descriptive name, like "a tall vine with purple flowers", or draw a descriptive picture. All drawings or descriptions should be based on observations. Younger students can rely completely on drawing what they find.
- Remind students of any boundaries or garden expectations (walk around the garden beds, only pick plants from a certain area) and allow 5-10 minutes to explore.
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### Digging Deeper

- Bring students back together before they become distracted.
- What evidence of animals did each pair find? Why did you choose that as evidence of a certain animal? Create a list of animals that they think live in the garden based on the evidence they found (chew holes, eggs, poop, etc). Encourage them to use evidence to justify why they think certain animals live there.
- Share that the animals, plants, people-made stuff, and other things they found are part of the garden ecosystem. An **ecosystem** is all the living and nonliving things that work together in a certain area.



## Ecosystem ABCs

*Use Abiotic, Biotic, and Cultural with older students. Living and non-living with younger students.*

*Instead of using journals and worksheets, students can also physically group their collected garden items into categories.*

*Something is biotic if it grows, reproduces, breathes, eat/gets energy, AND moves.*

### Seed St. Louis Resources

Connect with us on Facebook or Eventbrite to discover upcoming Educator Workshops. Subscribe to us on YouTube to discover season-specific gardening how-to's.



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- One way to talk about ecosystems is with the ABCs - **Abiotic** (non-living), **Biotic** (living or once was alive), and **Cultural** (human-made, can be biotic, abiotic, or a combination). Write these words on a small whiteboard or pass out the worksheet and provide at least one example of each. If ecosystem is a new concept, do not include Cultural category.
- What was the most interesting thing they found in the garden, and do they think it is abiotic, biotic, or cultural? Have students turn and talk then share as a group. Provide additional examples of abiotic factors, like water, sunlight, and rocks, if needed.
- Divide students back into their pairs to divide their lists into abiotic, biotic, and cultural parts of the ecosystem, using either labels or the provided worksheet.
- Help students with any confusions about categorization. Why did they put certain things in each category? What evidence did they find that something is abiotic, biotic, or cultural?

### Making Connections

- Bring the students back together and popcorn around the group a few examples of abiotic, biotic, or cultural parts of the ecosystem. If necessary, remind students that biotic includes all things that are living or once were living.
- Connect back to their definition of evidence. What do all biotic things in the garden have in common? How did you use evidence to justify if something was abiotic, biotic, or cultural?
- Look back at the guiding question. How do scientists categorize parts of the garden? What do you now know about the garden that you did not know before?