

THE EDIBLE
SCHOOLYARD
PROJECT

THE GARDEN AS AN
ECOSYSTEM

The Garden as an Ecosystem

Summary: In this lesson, students begin to explore the garden as an ecosystem. They learn that the principle of interdependence defines any ecosystem, and they look for examples of this principle at play in the garden. They also define, differentiate, and identify examples of *biotic* (living) and *abiotic* (non-living) factors in the garden ecosystem. They start to speculate on how these factors might affect one another and the crops. Understanding how the garden functions as an ecosystem will be a critical component for them developing and justifying their planting proposals in the final project.

This is the second of a 12-lesson series in which students will explore the basic ecological principle of interdependence through the lens of common organic farming practices.

Time: 45 minutes



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Teacher Notes:

- The “READ” and “DISCUSS” sections of this lesson plan can be used as talking points or a script to introduce activities.
- Some of the language used in this lesson may be new to your students. See [this resource](#) for strategies that help with vocabulary acquisition.
- If you are teaching this lesson in the garden, we suggest completing the activities as a whole class or in small groups. The garden is a great place for discussion-based lessons.
- Students will likely have different levels of background information and knowledge on the ecological principles discussed in this lesson. The most important component of this lesson however, is the practice of observation. You may want to take a little bit of extra time this day to really encourage students to be as detailed as possible with their observations. Their firsthand observations will form the backbone of their entire planning process for this unit.
- In Garden Observation Activity 2, students are asked to develop basic hypotheses and conclusions based on their observations and prior knowledge.
- Depending on your students’ comfort level with creating diagrams and models, the MODEL activity at the end of this lesson may be something you want to add extra scaffolding for. Encourage students to cite their observations from Garden Observation Activity 2 and the content of the subsequent Discussion in order to identify which factors they want to include in the model. It’s not important that this model be *accurate*, instead, this activity is meant to give students an opportunity to synthesize their first layer of learning on the interconnections they can observe in the garden. These are concepts they will return to over and over again in the following lessons.
- This is the second of a 12-lesson series in which students will explore the basic ecological principle of interdependence through the lens of common organic farming practices.



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Vocabulary:

- **Interdependence:** the dependence of two or more people, organisms, or things on one another.
- **Ecosystem:** A biological community of interacting organisms and their physical environment.
- **Abiotic factor:** a nonliving condition or thing, such as climate or habitat, that influences an ecosystem or the organisms in it.
- **Biotic factor:** a living thing, such as a plant or animal, that influences an ecosystem.
- **Biodiversity:** the variety of life and living things.

PAIR-SHARE

- What does it mean to depend on something or someone? Who or what do you depend on? Who or what depends on you?
- Can you think of any examples of parts of the garden that depend on one another? Explain your answer.

READ: Read L2 READING: What is an Ecosystem? As you read, you may want to [Talk to the Text](#) in order to help you understand the main ideas and track your questions.

DISCUSS: In pairs or as a class, discuss the questions below based on your reading.

- What is an ecosystem? What components do ecosystems include?
- What is an “abiotic factor”? What are some examples?
- What is a “biotic factor”? What are some examples?
- What is the ecological principle of “interdependence”? Can you give an example?
- Do you think the garden is an ecosystem? Explain your reasoning.

GARDEN OBSERVATION ACTIVITY ONE: Take a walk through the garden. As you walk, practice *noticing*. This means paying attention to details in your surroundings, and your own thoughts, sensations, and feelings.

- What **abiotic factors** (non-living elements of an ecosystem) can you observe? Try to find at least 5.
- What **biotic factors** (living elements of an ecosystem) can you observe? Try to find at least 5.
- Do you see any evidence of interactions between the abiotic or biotic factors you observed? Describe and give examples.
- Compare and contrast.
 - How are **abiotic factors** that you observed similar to and different from one another?
 - How are the **biotic factors** that you observed similar to and different from one another?



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GARDEN OBSERVATION ACTIVITY TWO: Now choose **one crop** to observe.

- How healthy does this crop seem? Support your answer with specific evidence from your observations.
- What factors (abiotic and biotic) do you think might be influencing the health of this crop?
 - What could be helping it to grow? Support your answer with evidence.
 - What might be hindering its growth? Support your answer with evidence.
 - Do you think there are any factors influencing its growth that you can't observe? Explain your answer.
- What questions do you have about your observations?

DISCUSS

Discuss your observations with a partner or the whole class.

- From what you know and can observe, what helps to make plants healthy? What can contribute to making plants unhealthy?
- Do you think there are any factors influencing the health of the garden that you weren't able to observe? Explain.

MODEL

- Create a diagram that illustrates the factors and relationships that are influencing the health of the crop you observed. Label your diagram.

REFLECT

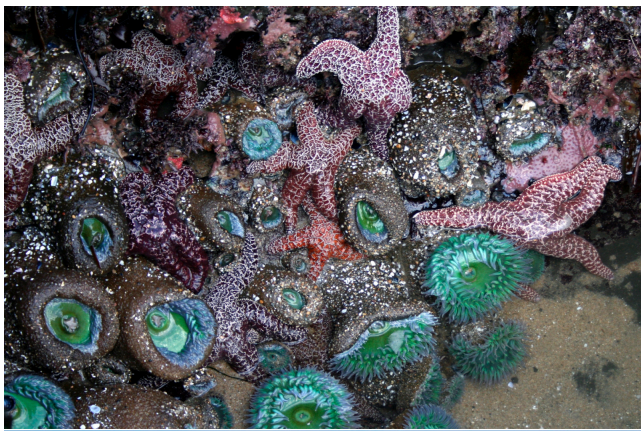
With a partner or the whole class, reflect on and discuss the following questions:

- After making your observations today, do you think the garden is an ecosystem? Explain your reasoning.
- How do you think that your observations from today might help you develop a planting proposal for your final project?
- What questions do you have about the garden or ecosystems after today?

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READING: What is an
Ecosystem?



Examples of different types of ecosystems—clockwise from top left: Tidepool, Forest, Tundra, Desert



READING: What is an Ecosystem?

An **ecosystem** is a “living system” made up of plants, animals, and other organisms that live in the same habitat, as well as their environment, and their interactions. Ecosystems include both **biotic factors**—living things like plants, animals, and bacteria—and **abiotic factors**—nonliving things like weather, water, rock, and sunlight. The biotic and abiotic factors in an ecosystem are constantly interacting. Their interactions and relationships are what make them an “ecosystem”.

Every factor of an ecosystem depends on every other factor, either directly or indirectly. For example, a change in the temperature of an ecosystem may affect what plants will grow there. In turn, animals that depend on those plants for food and shelter will have to either adapt to the changes (maybe by eating different plants, or diversifying their diet), move to another ecosystem, or risk perishing. This is the ecological principle of **interdependence**. All parts of an ecosystem rely on one another for survival and a change to one will inevitably cause changes in others.

Ecosystems can be very big, or very small. For example, a single tide pool or pond might make up an entire ecosystem, with a collection of abiotic and biotic factors that provide one another with everything they need. Other ecosystems might be much larger, such as a forest, savannah, tundra, or desert. Whatever the size, every ecosystem is defined by the relationships between all its factors.

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