



Chapter 46 Project

Backyard Ecology

Project Goal + Timeline

In this project, you will apply what you have learned about ecosystems and energy flow to your own surroundings. You'll select a study site, such as your backyard, a local park, a pond or river, or other nearby area, and observe and characterize the ecosystem at the site. Then, you'll use your observations to make predictions about the disruptions caused by ecosystem change. You may complete this project alone or with a partner. This project should take between two and three hours to complete.

Directions

Ecosystems are not abstract concepts designed for the pages of a biology textbook; they are real, vibrant, and complex collections of organisms and environments that are all around us and across the planet. There is likely an ecosystem right outside your door that provides the perfect test site for you to apply the principles and ideas you have learned in this chapter.

This project will require you to step outside, or if necessary, travel to a nearby area to complete this activity. Keep in mind that life is teeming everywhere; even a small plot of soil maintains a rich, dynamic, and vibrant ecosystem. You may want to take a copy of the questions listed here with you to make it easier to complete this field work.

1. What area have you selected? What broad type of ecosystem is this area? How can you tell?

Survey the site and identify as many living things as you can, noting their relative abundance in the environment. Organisms can be categorized in an ecosystem by the way in which energy flows through them. Give examples of an organism for each of the following categories and explain how you made this determination.

2. What is an example of a **primary producer** in the area?
3. What is an example of a **primary consumer** in the area?
4. What is an example of a **secondary consumer** in the area?
5. What is an example of a **tertiary consumer** in the area?
6. Why is it unlikely that you would find a quaternary consumer at the apex?
7. Of the species you observed, which do you think is a keystone species? Why?
8. Identify one example of part of the biogeochemical cycle that you observed or would expect to observe in your area.

Now, imagine something about your local ecosystem has changed. For example, let's suppose that one of the species you have identified is removed entirely from the ecosystem.

9. Which species will you imagine has gone extinct or migrated? If not the same as one identified in the preceding questions, how would you categorize this species with respect to energy flow?
10. How will the loss of this species affect the ecosystem? Will the ecosystem be viable, will it change, and/or will it collapse?

Species also move, either through normal means or through intentional introduction into different environments. Imagine that an invasive species not yet present in your local area is introduced.

11. What species not yet present do you suppose is introduced? How would you categorize this species with respect to energy flow?
12. How will the introduction of this species affect the ecosystem? Will the ecosystem be viable, will it change, and/or will it collapse?
13. Ecosystems can also change through other impacts of human activity outside of the introduction of a new species. What is an example of a human activity that can directly or indirectly effect your ecosystem? What effect would this activity have?

Project Materials

- Project worksheet and a pen
- Access to a local ecosystem—a backyard, local park, or other area with a variety of species

Student Checklist

- ☐ Select a study site (Question 1)
- ☐ Observe and classify organisms by trophic level (Questions 2–5)
- ☐ Answer questions about the ecology of your study site (Questions 6–8)
- ☐ Make predictions about the effects of ecosystem change (Questions 9–13)