

JOBS IN A BIOTIC COMMUNITY

OVERVIEW

Students take a census of an outdoor site, and look for organisms that perform different “jobs” in the biotic community.

GRADE LEVEL: 3-5





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Learning in the Real World®

Learning in the Real World is a publishing imprint of the Center for Ecoliteracy, a not-for-profit, tax-exempt organization. Created in 1997, Learning in the Real World offers resources to support schooling for sustainability, stories of school communities, and the ecological framework that informs the work of the Center.

JOBS IN A BIOTIC COMMUNITY

PURPOSE

A biotic (or natural) community is made up of the various organisms that live and interact with one another in a particular environment. As in a human community, its members have different roles and depend on each other for survival. In this activity, students examine a study area to find out what organisms live there and the ecological jobs or niches they fill.

GRADE LEVEL

3-5

ESTIMATED TIME

30 minutes at the outdoor site, plus 15 minutes in the classroom to introduce the lesson and 15 minutes to wrap up.

BACKGROUND

Every living thing is interdependent with the other living things in its community. In human communities, people have different jobs that help the community as a whole thrive. In biotic communities, organisms have different roles or niches that enable each individual species to survive and the entire community to persist.

A niche is the ecological role of a species in a community. For example, fungi act as soil producers by breaking down rock and organic material to form soil. Sow bugs act as recyclers by decomposing dead plants and animals, and returning the organic material to the soil for reuse. Birds act as transporters by moving seeds and other objects from place to place in their beaks or stomachs. Bees act as pollinators by carrying pollen from one flower to another. And, all plants and animals can serve as food for other organisms.

This activity helps students understand the concept of niches in a biotic community by looking for organisms that do various jobs there. The “Community Census” student page lists possible jobs, and some sample animals and plants that perform them.

MATERIALS

- Boundary markers, such as rope or landscape flags
- Copies of “Community Services” student page
- Copies of “Community Census” student page
- Trowel or ruler for each pair of students (optional)
- Magnifying lens for each pair of students (optional)

PREPARATION

- Find a suitable outdoor site for doing the activity. If possible, it should have a variety of vegetation and enough space for students to work. It may be a small area on the school grounds with trees or shrubs, or a section of a nearby park, field, woods, stream, or seashore.
- Mark the boundaries of the study site with rope or flags.
- Make copies of the student pages.

LESSON INTRODUCTION

Ask students to name jobs in their community that are necessary for the community to survive, listing their suggestions on the board. Introduce the idea that other organisms also have roles or jobs in their community (see the

Background). Distribute copies of the “Community Services” student page and ask students to match services in nature with ones found in their community (see the Answer Key below). Introduce the term “niche” as an organism’s role in a biotic community.

ANSWER KEY TO “COMMUNITY SERVICES” STUDENT PAGE

A-3, B-4, C-7, D-2, E-8, F-9, G-6, H-1, I-5

Ask students if they have ever heard the word “census” before. If they don’t know it, explain that it is a survey of the people who live in a region or country. A census often includes details like age and type of work, and census takers are people who collect the data by going to individual homes.

CONDUCTING THE LESSON

- 1 Explain to students that they will be census takers in a biotic community. Their job will be to tally the members in the community, and to try to determine what their jobs (niches) are. Point out that if they do not know a community member’s job, they can try to figure out how it affects the other community members and make up a name for that job.
- 2 Divide the class into pairs, and give each pair a copy of the “Community Census” student page. Help students understand the different jobs listed, introducing any new words. Ask students if they can think of other jobs that animals or plants in a community might perform. Invite them to add these to the list at the bottom.
- 3 Ask students what organisms they might expect to find at the study site and list these on the board.

- 4 Take students to the study site, pointing out the boundaries.
- 5 (Optional) Distribute the trowels or rulers, and the magnifiers. Explain that students may use these tools to get a closer look at the organisms in the community.
- 6 Make sure students understand that they must be careful not to hurt or remove any plants or animals.
- 7 Direct students to list and tally all of the different organisms they find at the site. (If they don't know the precise name of one, they can give it a descriptive name or draw a picture.) For each different organism, have them try to identify its job in the community.
- 8 If students need help coming up with additional jobs, point out that besides being "food producers," plants provide places and materials for shelter, shade, nests, or hiding. Also, most living things provide food for other organisms by getting eaten.

DISCUSSION AND WRAP-UP

Lead a discussion about students' findings:

- How does the list of organisms we expected to see compare to those we did see?
- What biotic community members did you find and what are their jobs?
- Are there any organisms whose job you didn't know? How could we learn more about their niche?
- Are there any organisms that "moonlight" (have more than one job)?
- Are there any organisms that seem to have no job?
- What would happen if one member of the community wasn't there? For example, imagine that a drought killed all the trees: how would that affect the community?

- Looking at the “Community Services” student page, what additional services could we add to the Services in Nature column? What human community service might they correspond to?

Invite pairs to choose a plant or animal they observed and do an Internet search about its role in the biotic community. You may have them write a paragraph on what they learned and share it with the class.

SOURCES

Information for “Community Services” student page was derived from:

Environmental Literacy Council. “Ecosystem Services.” Accessed at <http://www.enviroliteracy.org/article.php/1503.html>.

Richards, Sabrina. “Natural-Born Doctors.” *The Scientist*. October 23, 2012. Accessed at <http://www.the-scientist.com/?articles.view/articleNo/32966/title/Natural-Born-Doctors/>.

COMMUNITY SERVICES

Can you match the services in your community with the services found in nature?
Draw a line to show the matching services.

HUMAN COMMUNITY SERVICES

- A Farmer
- B Power company
- C Garbage collection
- D Fire station
- E Construction company
- F Grocery store
- G Beauty parlor
- H Sewage treatment plant
- I Health care center

SERVICES IN NATURE

- 1 A river cleans the water that moves through its system.
- 2 Rain puts out wildfires.
- 3 The wind spreads seeds.
- 4 The sun gives plants energy that helps them grow.
- 5 Monarch butterflies lay their eggs on certain plants to prevent disease.
- 6 Monkeys groom each other to keep clean.
- 7 Worms eat dead plant and animal matter.
- 8 Wasps gather mud to make nests for their young.
- 9 Plants provide food for many animals.

Name _____

COMMUNITY CENSUS

Record either the name or a description of each community member you find. Tally the number you see by counting or estimating. Write down its job in the community using the list below or your own idea.

COMMUNITY MEMBER	HOW MANY FOUND? (TALLY IN)	JOB

SAMPLE JOBS

Soil Loosener: Turns and loosens the soil so that plants can grow more easily.
Examples: earthworm, gopher, mole.

Garbage Collector: Eats dead plants and animals. Examples: ant, sow bug, termite, turkey vulture, pigeon, gull, crow.

Food Producer: Uses the sun's energy to make food. Examples: all green plants.

Mover: Moves things, like seeds, from one part of the community to another part.
Examples: bird, squirrel, dog, cat.

Population Controller: Eats animals and keeps the community from getting too crowded. Examples: cat, snake, spider, lizard, frog, hawk, robin.

Fertilizer: Fertilizes the soil by adding waste such as fallen leaves, or dead plant parts. Examples: all animals and plants.



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