



Outdoor Biology Instructional Strategies

SHAKE IT!

BACKGROUND

Shake It! Can be conducted either in a standard OBIS activity format or as a hiking activity. Choose the format that suits your plans, and get shakin'!

A community is a group of plants and animals living and interacting in an area. Some communities, such as the community of living organisms in the Bering Sea, are huge. Other communities, such as those found on a Cyprus tree, oak tree, or willow, are composed of fewer organisms and occupy much less space. Whatever the size and make up of the community, certain factors are universal. A community contains plants, which make food to support the community. Some animals existing in a community eat the plants. Many communities also contain predatory animals that eat other animals. In addition, a community contains micro-organisms that decompose the community's dead organisms and waste products.

In this activity, the focus is on the animals in a community. The students investigate some relatively simple communities by shaking the foliage of trees and shrubs to find the animals that make their homes on the leaves and branches. The students compare these animals to the animals of a "mystery community" gathered by you before the activity. From the results of their own shake downs the students determine which kind of plant yielded the mystery community. Following the shake down, the students observe community interactions using a homemade View Chamber.

MATERIALS

For each student:

- 1 3" x 5" card
- 1 Shake-It Container (see Equipment Card 3)
- 1 hand lens* or bug box*

For the group:

- 1 "Shake-It Container" Equipment Card

Additional materials for activity format:

- 1 roll of masking tape
- A few extra plastic bags

- 1 large View Chamber (see Equipment Card 3)
- 1 data board and marking pen (optional) (see Tool Box 1)

*Can be easily made by taping a convex lens to the top of a small box with a hole on top. Make sure the focal length of the lens is about the same as the depth of the box.

PREPARATION

Site and timing:

Shake It! Is an activity for a warm spring or summer day. Select a site with a variety of trees and shrubs with low foliage that students can easily reach and shake. Hardwood forests, stream and pond edges, and brushy areas are all excellent sites. Also, keep in mind that a stiff breeze can make this activity very difficult.

Make up enough Shake It containers for every participant to have one. If you plan to use the activity format, make one or two view chambers. (See the “shake-It Container” Equipment Card in the OBIS Toolbox folio for information on construction and use of both pieces of equipment.)

ACTIVITY FORMAT

CHALLENGE

Find a community that matches the mystery community by shaking down trees and shrubs.

PREPARATION

Shortly before meeting with your group, go to the activity site and shake a few plants to familiarize yourself with the animals living on each kind of plant. Select a plant with a nice variety of critters and shake them into a plastic bag. This sample will be the “mystery community.” Keep leaves out of this bag as they will spoil the mystery for the students. In a separate bag, place a leaf sample of the mystery-community plant as well as leaf samples from enough other plants for each team to have a different leaf sample.

ACTION

1. Show the group the bag containing the animals from the mystery community and tell them that these animals make their home in one of the trees or bushes in the area.
2. Define community as a group of plants and animals living and interacting in an area. Write the definition on your data board. Tell the group that for the purpose of this activity the animals living and interacting on one plant make up a community.
3. Have the group inspect the animals from the mystery community. Let the students use their magnifiers to get a close look at the animals. Tell them that the critters all came from one plant. You may wish to let the students make up names for the animals and write them on the data board under the definition of community.
4. Introduce the Shake-It Container as a tool for sampling communities of small animals in plant foliage. Demonstrate its use and distribute one to each student. Give each student a 3" x 5" card and demonstrate how to use it to scrape clinging critters into the Shake-It bag.
5. Show the group the leaf samples and explain that the mystery animals came from a plant represented by one of the leaves. Let the students team up with a friend and select one of the leaf samples. Challenge them to use their leaf as a clue to help them find their plant. Each team may have to shake several of its kind of plant to gather a good sample of animals.
6. When the teams have shaken down their plants, call them back. Who shook the plant that harbored the mystery-community animals? Compare the students' animals with the mystery-community animals. Does one sample match the mystery community exactly? Close? Are several other samples similar?

7. Use your View Chamber to further investigate community dynamics. Have each team go back to its plant and collect one branch sample 10 to 15 cm long. Place these in the chamber, spaced equal distances apart. Have the teams dump their animals into the chamber by removing their bags from their Shake-It Containers and shaking the contents into the view chamber.
8. Chamber interactions to look for:
 - a. Do animals return to the kind of plant out of which they were shaken?
 - b. Do some animals seek protected places? Are they camouflaged?
 - c. Do the spiders spin webs? Do any animals capture other animals and eat them?
 - d. Do any of the animals eat any of the plant samples?

COMMUNITY ACTION QUESTIONS

-Which plant seemed to host the richest, most diverse community? How many different kinds of animals were found in that community?

-Describe some of the interactions you observed in your community. How do you think these interactions help to keep the community going?

-Which community had the most animals? The biggest animal? Smallest? Brightest Colored? Best camouflaged? Fewest?

-Did your Shake-It Container do a good job of sampling ALL of the critters on the bushes you investigated? What critters were not sampled? (Animals that clung tightly, animals that flew away.)

HIKE FORMAT

CHALLENGE

Discover what kinds of animals live on plants along the sides of trails.

ACTION

1. During a pause at trailside, introduce your students to the Shake-It game. Tell them that lots of animals are within arm's reach on either side of the trail. Challenge them to find some of these animals along the trail. Demonstrate the use of the Shake-It Container and offer it as a tool to help them get a closer look. Distribute 3" x 5" cards (for tapping or nudging clinging critters off plants) and hand lenses.
2. When everyone has practiced the technique, challenge the students with some of the following:
 - a. Pick one kind of plant to shake at different places along the trail. Which animals appear time and again on that kind of plant?
 - b. Have each student secretly shake down a good sample of critters from a plant. Let each student then challenge a friend to discover what kind of plant was shaken to produce these animals.
 - c. Show an animal to the group. Challenge the group to find as many different kinds of plants as possible that harbor that animal. When the students find that animal on a plant, have them take a leaf sample. Then have the group determine if the animal is found on only one kind of plant or common to many kinds of plants. Try another animal.

TRAIL-END QUESTIONS

-What kinds of animals were not common on the bushes and trees you shook?

-Were many of the animals camouflaged?

Were there any animals that were found on only one kind of plant? Why do you suppose one animal might live on one plant to the exclusion of all others?

FOLLOW-UP

1. Shake some plants at night. Are the nighttime communities the same as the daytime communities?
2. Shake some seaweed or freshwater plants washed up on a beach. Put the animals in some water and observe these aquatic communities.
3. Shake some plants in a vegetable or flower garden (carefully) to discover what animals might be responsible for plant damage.

WHAT TO DO NEXT

Mystery Marauders

Web It

Adaptation—Predator-Prey

Animal Diversity

Litter Critters