

# HOPPER HERDING



## OVERVIEW

Hoppers—grasshoppers, katydids, and crickets—are the focus of this activity. The youngsters round up a “herd” of hopping insects and find out how many different kinds are in their herd.

## BACKGROUND

Walk through a meadow or grassy field on a warm, sunny day, and you will see hoppers jumping and flying out of your path. If you stop to take a closer look, you will find that these insects (grasshoppers, katydids, and crickets) are of many sizes, shapes, and colors, and make up a conspicuous part of the field community.

There are several features that distinguish one kind of hopper from another. For instance, not all hoppers have antennae

of the same length. You can use antennae length to separate hoppers into two subgroups: short-horned hoppers (antennae short relative to body length) and long-horned hoppers (antennae long relative to body length). The shapes of hoppers' heads are also different. Some hoppers have angular heads; others have more rounded heads. The tail-like ovipositor is a feature that not only identifies (by its length and shape) hoppers of different kinds; but also distinguishes males from females of the same kind. (Only female hoppers have ovipositors, which they use to lay their eggs in the ground.)

**BIO** Animal Investigation  
**KEY** Bio-Technique  
Key Characteristics



Antennae length, head shape, and ovipositer length and shape are called key characteristics. A **key characteristic** is any distinguishing feature that can be used to separate different kinds of organisms. Each different kind of organism is a species. A **species** is a group of organisms that is different from all other kinds of organisms.

**CHALLENGE: ROUND UP HOPPERS, AND FIND OUT HOW MANY DIFFERENT KINDS ARE IN YOUR HERD.**



## MATERIALS



### For each youngster:

- 1 large ziplock bag\*
- 1 hand lens\* or bug box\*

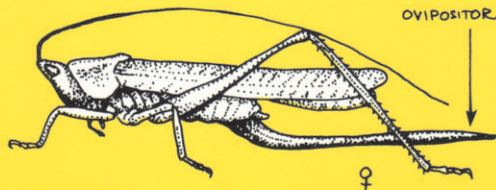
### For each team of three or four youngsters:

- 1 clear plastic sheet\* (for the corral),  
100 cm × 130 cm

### For the group:

- 2 data boards or large drawing pads\*
- 2 marking pens\*
- extra ziplock bags\*
- 1 "Hopper Herding with a Plastic Corral"  
Technique Card\*
- stiff wire\* to make cages (optional, for  
"Branching Out")

\* Available from Delta Education.



## PREPARATION



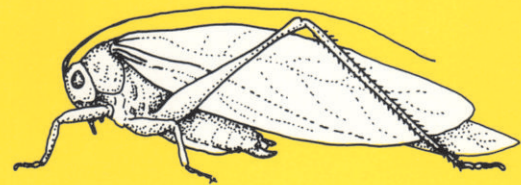
**Group Size.** This activity is suitable for groups of up to sixteen youngsters.

**Time.** Plan on fifty to sixty minutes on a warm, sunny day for this activity.

**Site.** The site is very important for the success of this activity. Find a grassy field that is densely populated with a variety of hoppers (at least three different kinds). The site should be literally "hopping" as you walk through it.

## Materials

- Hopper Corrals.** Two-mil-thick plastic drop cloths make ideal corrals. Most paint and hardware stores have drop cloths in 9' × 12' sheets—enough to make nine corrals.
- Read over the "Hopper Herding with a Plastic Corral" Technique Card so you can demonstrate the technique to the group.
- You will be preparing two game bags of assorted hoppers for use in "The Hopper-Characteristic Game." Read the game instructions carefully before conducting the activity.



## ACTION



## HERDING THE HOPPERS

- Tell the youngsters that they are going to examine the hopping animals in the grassland. With the aid of three youngsters, demonstrate the use of the plastic corral to herd and trap the hoppers. Give the youngsters a chance



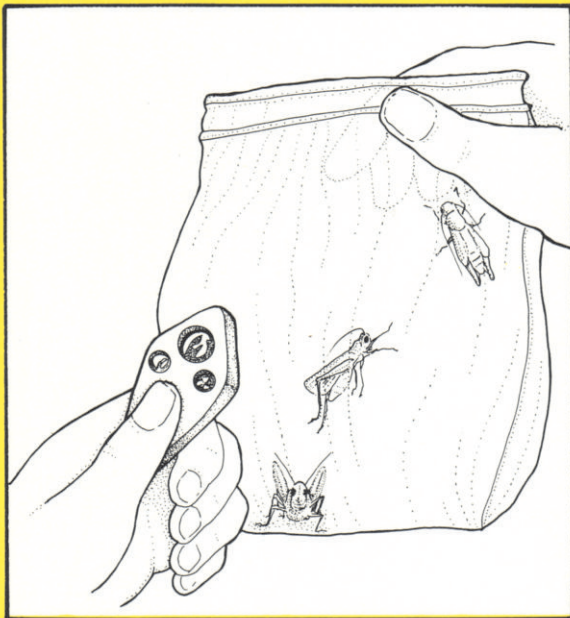


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to see the hoppers move about under the plastic corral and then show them how to “bag” a hopper. Remind the kids that all the animals should be handled carefully; the animals must be released unharmed at the end of the activity.

2. Divide the youngsters into teams of three or four. Give each youngster a ziplock bag, and each team a plastic corral. Challenge the youngsters to bag as many different kinds of hoppers as they can.



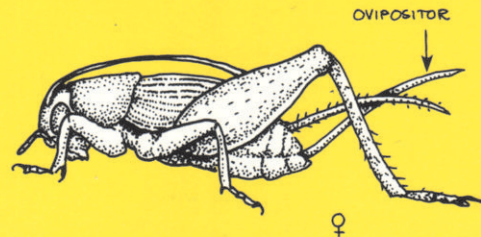
3. Circulate among the teams, encouraging all the youngsters to observe all the animals in the mini-community underneath their plastic corral while they bag the hoppers.

4. After each youngster has collected a number of different hoppers (about ten to fifteen minutes), call the teams together, and ask the youngsters to pair up. Distribute hand lenses or bug boxes for a closer look at the hoppers. Challenge each pair to decide how many different kinds of hoppers they have in their two bags. Caution the youngsters to keep closed bags out of direct sunlight so the hoppers don't die.

5. After the pairs report how many different kinds of hoppers they found, introduce and define **species** to the group. (See the “Background” section.)

6. Ask your youngsters how they distinguished one species of hopper from the others. Make a list of the differences the kids mention on one of the data boards. Their list should include some of these characteristics:

- Length of the antennae (feelers) as compared to body length.
- Shape of head.
- Color.
- Markings on the legs, back, and head.
- Length of the wings as compared to body length.
- Overall size.
- Shape and length of the female “tail” or ovipositor.



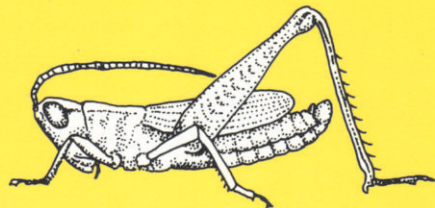
If the youngsters don't mention all these characteristics, add the ones they missed to the list. Make sure the youngsters understand what the various characteristics are.

7. Introduce the term **key characteristic**. Tell the kids that they have made a list of the key characteristics or distinguishing features of hoppers. Review the key-characteristics list as you reproduce it on the second data board. (You will need two lists for the Hopper-Characteristics Game.)

8. Select one hopper from someone's bag and place it in an empty bag. Describe the hopper to the youngsters, using the list of key characteristics for guidance. For example, you might say, “This hopper has antennae longer than its body, has no special markings, is all green, has wings that are longer than its



body, and has a very long, spearlike ovipositer that points straight back." Pass the bag around so everyone can see the hopper.



### THE HOPPER-CHARACTERISTIC GAME

**1.** Eight youngsters is the maximum for one game. If your group is larger, divide it into two equal groups. Each group will play a separate game. Collect all the youngsters' hopper bags. Take a variety of hoppers from these bags and make a game bag of assorted hoppers for each group of eight. Each game bag should contain at least four but not more than seven hoppers.

**2.** Give each group one game bag along with one of the data-board lists of key characteristics. The game bag should be placed on the ground in the center of the group so everyone can see the hoppers in it. Explain the rules.

- a. One youngster is the key witness. She secretly chooses a particular hopper from among those in the game bag. The chosen hopper remains in the bag along with the others for the group to see.
- b. The key witness then describes the secret hopper in terms of its key characteristics while the rest of the group views the bag of hoppers.
- c. When the key witness is finished, the group guesses which hopper the key witness described.
- d. Give each youngster a chance to be the key witness.

**3.** After each youngster has been a key witness, challenge the youngsters to

describe a hopper using only one or two key characteristics. Can the group still guess which hopper the key witness describes?

**4.** Give each of the youngsters a bag of hoppers, and challenge them to find out what happens when the hoppers are released. How do they escape? Do they hide? Hop? Fly? Where do they go?

### BRANCHING OUT



Hoppers are voracious plant eaters. Challenge the youngsters to find out how much a hopper can eat. The youngsters can make a hopper cage by forming a 60-cm piece of stiff wire into an oval and placing it into the bottom of a large ziplock bag. They should make air holes near the top of the bag. The youngsters can keep a hopper in the cage for a few days and feed it different kinds of green leaves to see how much it eats. What might a large number of hoppers do to an agricultural crop?





## Hopper Herding

### Technique Card



## HOPPER HERDING WITH A PLASTIC CORRAL

### Using the Plastic Corral

1. Each member of a team takes an edge of the outstretched sheet.
2. The team walks rapidly through the grass and then springs and pulls the sheet down onto the grass quickly, trapping all the critters below.

### “Bagging” a Hopper

1. As the team members press the corral flat against the grass, hoppers (if any are present) will appear against the plastic.

2. One person surrounds the hopper with his hands over the plastic sheet.
3. Another person reaches under the plastic, grabs the trapped hopper, and places it in a ziplock bag.
4. If the youngsters don't want to handle the hoppers, they can use the plastic bag to scoop the hoppers up. (Hoppers rarely bite. They may, however, “spit” a harmless brown liquid.)
5. Sealed hopper bags must be shaded from direct sunlight to protect the hoppers from overheating.

