

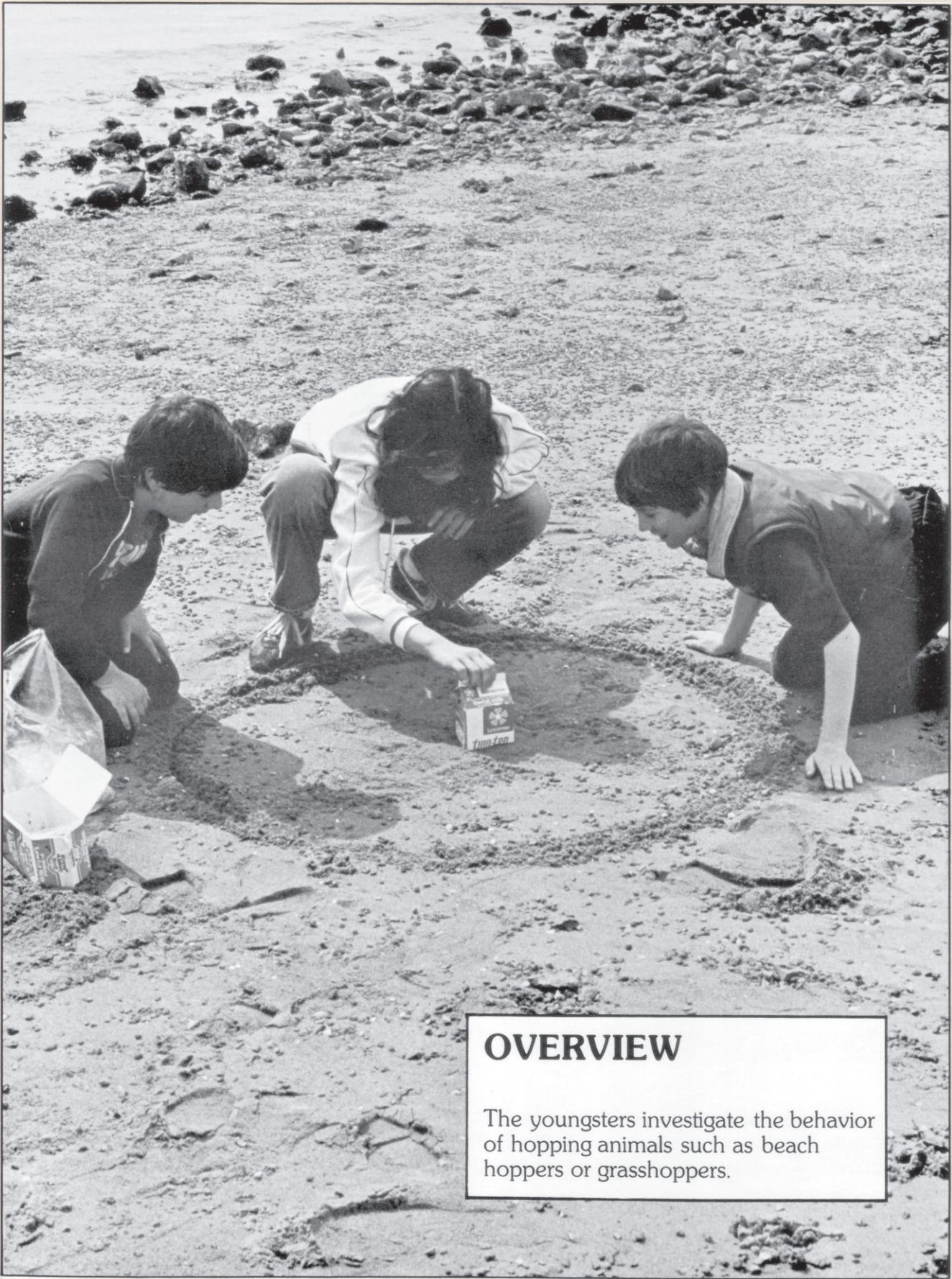
HOPPER CIRCUS

BIO
KEY

Animal Study
Search and Capture
Behavior

OVERVIEW

The youngsters investigate the behavior of hopping animals such as beach hoppers or grasshoppers.



BACKGROUND

What an animal does in response to a stimulus is called **behavior**. Stimuli may come from a part of the animal's body (internal stimulus) or from the outside environment (external stimulus). For example, when hungry or thirsty, an animal will find something to eat or drink; or when approached by another animal, it may fight or run away. In this activity, it is sufficient to define *behavior* as "what animals do" or "how animals act."



GRASSHOPPER

Hopping animals make good subjects for behavior investigation because they are usually active and hardy. *Hopper Circus* features common hopping animals that live in your area. If they are available, use grasshoppers or beach hoppers, because they usually occur in large numbers and are fairly easy to catch. You may also use leaf hoppers, crickets, frogs, or toads as the stars of *Hopper Circus*.

CHALLENGE: CAPTURE SOME HOPPERS AND INVESTIGATE HOPPER BEHAVIOR.

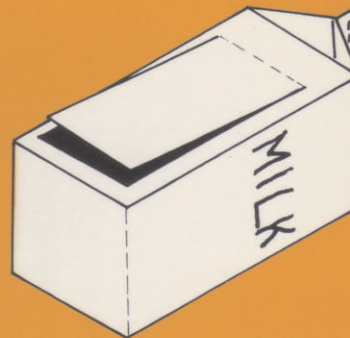
MATERIALS

For each team of two:

- 1 half-gallon milk carton
- 6 small hoppers (beach hoppers, leaf hoppers, crickets, or small grasshoppers) or 1 large hopper (frog, toad, or large grasshopper)

For the group:

- 4 half-gallon milk cartons with flap (See the "Preparation" section.)
 - 4 milk-carton halves
 - 4 rubber bands* that fit snugly around a milk carton
 - clear plastic wrap*
 - 4 meter tapes*
 - 2 sticks (any size)
 - 3 meters of string*
 - large nets* or sweepnets* (to catch grasshoppers, crickets, frogs, and leaf hoppers) or small nets* to catch beach hoppers
 - 2 sheets of Sideshow Cards*
 - 2 to 3 copies of each Sideshow Card (See the "Preparation" section.)
- * Available from Delta Education.



PREPARATION

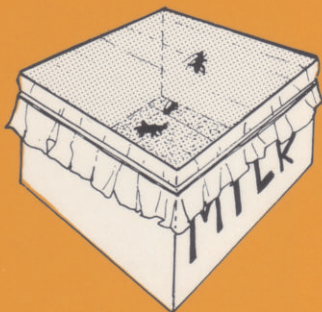
Group Size. This activity can be used with any size group if there are enough hoppers to go around. Groups of twelve or fewer youngsters are best if you plan to use large hoppers such as frogs or toads.

Time. Plan on fifty to seventy minutes for this activity.

Site. Choose a site that is well populated with hoppers. Beach hoppers hide under decaying seaweed and other debris above the high-tide zone along the coast or in salt water bays. Open fields are good places to look for grasshoppers and crickets. You can find frogs around ponds, streams, and marshy areas; and



toads in lawns. Locate an area of smooth, hard-packed dirt or sand in full sunlight for setting up the race courses.



Hopper Displays. Prepare two hopper displays just before the activity. Place several hoppers into each of two milk-carton halves and cover the cartons with clear plastic wrap. Secure the wrap with a rubber band. (Note: Make sure you don't leave the displays in the open sun.)

Materials

1. Close the spout-end of four milk cartons, and staple the ends shut. Then cut a flap in one side of each carton.
2. **Sideshow Cards.** Make two or three copies of each sheet of Sideshow Cards. Cut the cards apart.

Safety. When working around the water, use the buddy system. (See the *Leader's Survival Kit* folio.) OBIS does not suggest going into the water, but find out who the non-swimmers are in your group, and keep an eye on them.

Take 'Em Back Alive! Stress for the group the importance of being careful with all living organisms. Frogs and beach hoppers dry out quickly if they are not doused with water from the site every five or ten minutes, and you should handle frogs with wet hands only. The youngsters should keep the organisms only long enough for observation and then release them unharmed at the place where they were found.

ACTION

1. Gather the group, and discuss safety and conservation precautions. Explain the procedure for handling aquatic animals and for keeping them moist. (See the "Preparation" section.)
2. Announce that the youngsters will conduct a "Hopper Circus" to investigate hoppers.
3. Introduce the stars of the show by passing around the hopper displays you prepared earlier.
4. Explain that more performers are needed before the circus can open. Point out boundaries for the activity site, and divide the group into teams of two. Challenge each team to bring back about half a dozen small hoppers for the circus sideshows. (If you are using large hoppers, one for each team is enough.) Give each team a net and milk carton.
5. When the kids have captured enough hoppers, have each team select a Sideshow Card. If the teams are working with large hoppers, each will use just its one animal for each challenge.
6. Spread out the sideshow materials and let the circus begin!
7. Circulate among the sideshows and offer assistance where needed. When teams complete one investigation, encourage them to trade in the completed Sideshow Card for a new one. Each team should work with several of the Sideshow Cards.
8. About five minutes before it appears that the youngsters will complete the sideshows, begin setting up the Hopper



LEAF HOPPER

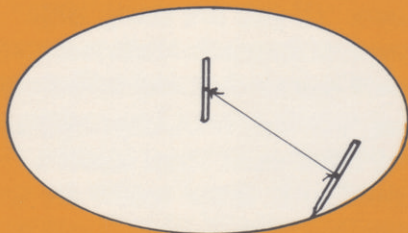
HOPPER CIRCUS

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Race Course. For every four youngsters, draw one circle in dirt or hard-packed sand. If you will be racing beach hoppers, make the circles one meter in diameter; crickets, toads, small frogs, or grasshoppers—two meters; large grasshoppers or toads—three to four meters. Note: An easy way to draw the circles is to use a compass made from a stick and some string. Tie a stick to each end of a string that is as long as the radius (half the diameter) of the circles. Secure one stick in the center of the circle (or have a youngster hold it there), stretch the string to make it taut, and scratch the circle in the ground with the other stick.

9. When about twenty minutes remain in the activity period, call the youngsters together and announce the main event.



The Hopper Race

1. Tell the kids that they will now race their hoppers and get a chance to use the information they gathered while conducting the sideshows.

2. Go over the following rules and procedure:

- The race is run from the center of the circle to its edge.
- Only two hoppers may race at a time in any one circle. (It is hard to keep track of more than two.)
- The first hopper to reach the edge is the winner.

To run the race:

- Place both hoppers under half a milk carton in the center of the circle.
- Remove the milk carton to start the race. The youngsters can do anything to help their hoppers *except* touch them with anything.

BEACH
HOPPER



3. Divide the group into teams of four, and ask each youngster to select a hopper to race. Send each team to a race course to determine the fastest hopper in each team. Then hold races to determine the fastest hopper for the whole group.

CIRCUS TALK

Tell the youngsters that the term **behavior** means what animals do or how they act. Ask the youngsters to discuss what they learned about the behavior of hoppers from their sideshow investigations and the hopper races.

Raise the following questions:

- How do your hoppers hop?
- What makes them hop?
- How far can your hoppers hop?
- How can you get hoppers to hop without touching them?
- If you were going to breed a grand-champion hopper, what qualities would you want it to have?

BRANCHING OUT

1. Repeat the activity with a different kind of hopper.
2. Compare the jumping abilities of different kinds of hoppers.

FROG





Hopper Circus Sideshow Card #5



Light. Do the hoppers seem to hop better in sunlight or shade?

Test several hoppers to find out.

Flashing light. Get a milk carton with a flap from the leader. Put some hoppers into the carton and close the flap. Keep it closed for a minute and then open the flap quickly to see if the hoppers react to the light. What do they do?

Repeat the test several times.



Hopper Circus Sideshow Card #7



Direction. When a hopper makes a series of jumps, is each jump made in the same direction or in a variety of directions? Test ten hoppers to find out.

This



or this



or ?

Hopper Circus Sideshow Card #6



For small hoppers only!

Attraction. Put different materials into the four corners of a milk carton with a flap and add some hoppers. To which materials do the hoppers go? Repeat several times.

What is there about these materials that seems to attract the hoppers?



Hopper Circus Sideshow Card #8



What makes your hoppers hop?

Discover what makes your hoppers hop. (Hint: Try shouting, clapping your hands, pounding the ground, gently touching or pushing the hopper from behind.)

What are the best ways to get your hoppers to hop?

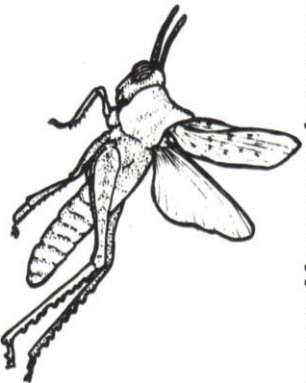


Hopper Circus Sideshow Card #1



How does a hopper hop?

Closely observe a hopper as it hops and try to figure out how it hops. What parts of its body does a hopper use to hop?



Hopper Circus Sideshow Card #3



Slope. Does your hopper tend to go uphill, across the hill, or downhill when placed on a slope? Try facing the hopper in different directions.

Test three or four animals.



Hopper Circus Sideshow Card #2



Distance

1. How far can a hopper jump with one hop?
2. Does the distance a hopper hops in one hop change as it hops more and more?



Hopper Circus Sideshow Card #4



Sight. Do the hoppers seem to have good vision? How do they react to quick movements? Slow movements? Close movements? Distant movements?

Try several hoppers. Be as quiet as possible.

