ACORNS

BIO KEY

Game/Simulation
Winter Survival
Food Storage

OVERVIEW

By playing a winter survival game, the youngsters compare the food-storage strategies of different kinds of squirrels.

BACKGROUND

In many regions, winter brings subfreezing temperatures and food shortages for local wildlife. Some animals avoid winter's harsh conditions by migrating to areas with mild climates and plentiful food. The animals that remain in cold regions survive by hibernating or by adapting in other ways.

Storing food during the fall is one way that some winter residents prepare for the lean winter months. Beavers stash aspen, cottonwood, birch, and willow limbs under their lodges to maintain a supply of bark for food. Pikas, small rabbit-like animals living high in the western mountains, insure their winter food supply by collecting and drying grasses and other plant materials to make hay. The pikas then store the hay in underground caches.

Chipmunks and squirrels are winter-food hoarders familiar to most of us. During the fall months, these rodents gather large quantities of acorns, pine nuts, and other seeds. Chipmunks and red squirrels tend to hoard their winter food supply in one place, while grey and fox squirrels bury their food in many different places.

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CHALLENGE: STORE A SUPPLY OF NUTS AND THEN RECOVER ENOUGH OF THEM TO SURVIVE THE WINTER.

MATERIALS

For each youngster:
20 nuts (See the "Preparation" section.)
1 plastic bag*
1 index card* or small piece of paper

For the group:
4 boundary markers*
1 large brown paper bag*
1 data board*
1 kitchen timer* or watch with a second hand
several permanent-ink, fine-tip marking pens*
white adhesive tape

* Available from Delta Education.

PREPARATION

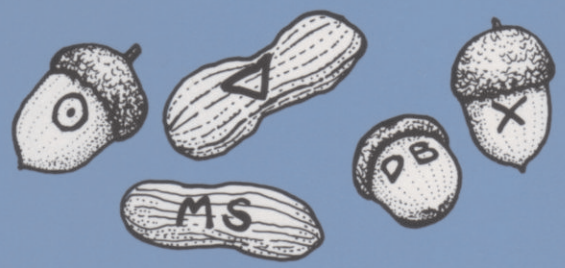
Site. Choose a site about half the size of a tennis court, with plenty of acorns or other nuts. If there are no acorns or other nuts at the site, you may prepare the area by "seeding" it with nuts or seeds you have obtained elsewhere. You should provide *at least* ten nuts for every youngster. (Unshelled peanuts work well.) The site should be covered with a thick layer of leaves or snow. Use the four flags to mark off the "squirrels' forest."

Group Size. This activity is particularly suitable for large groups, but works with a group containing as few as eight youngsters.

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

Materials

1. Marking the Nuts. Each youngster will mark each of the nuts in his supply so that the nuts can be distinguished from everyone else's. Fine-tip, permanent-ink marking pens work well on light-colored nuts. The youngsters can mark pieces of white adhesive tape and press them onto dark-colored nuts.



2. Index Cards. Prepare an index card for each youngster. Write "red squirrel" on half of the cards and "grey squirrel" on the remaining cards.

ACTION

Introducing the Game

1. Ask the kids if they can think of any animals that store food for the winter. What kind of food do these animals store? (For example, chipmunks and squirrels store nuts and seeds.)

2. Tell the group that different animals have different ways of storing their winter food supply: red squirrels store all their food in one place, and grey squirrels hide their food in many places. Announce that each youngster is going to play the role of either a *red* or a *grey* squirrel in a game of winter survival. Let each youngster draw a labeled index card to determine the kind of squirrel he or she will be. Ask them to keep their identities secret. Collect the cards.

3. Give one plastic bag to each of the "squirrels" and tell them that the bags represent their "cheek pouches" for carrying food.

Fall Preparation

1. Announce the arrival of fall. Tell the youngsters that it is time for the squirrels to gather their winter food supply. Show the "squirrels" an example of the kind of nut or seed you want them to collect. Point out the boundaries of the squirrel forest, and tell each squirrel to gather at least ten nuts. Give the signal to begin, and allow one to two minutes for gathering.

2. Call the group together. Ask each youngster to mark his winter nuts so that they can be distinguished from everyone else's. Distribute the marking materials, and show the youngsters how to use them. Let each kid mark at least ten nuts (but no more than twenty). The youngsters should toss any extra nuts aside or share them with anyone who did not gather ten nuts.

3. Tell the squirrels that they are now going to hide their nuts for the winter. *Red* squirrels must store all their nuts in *one place*. *Grey* squirrels must store their nuts in *many places* that are at least two paces apart with no more than three nuts in any one spot. Give the squirrels two minutes to store their nuts.

Winter Survival Game

1. Call the group together and announce that the winter season is three "months" long and that each month lasts for two minutes. Write "January," "February," and "March" across the data board as illustrated.

2. In "January," each squirrel will need to recover at least three of his stored nuts to survive. (Each squirrel must recover his *own* nuts.) Give the group two minutes to try to recover three nuts.

3. Record on the data board the number of squirrels that gathered three nuts. Squirrels that "starved" (that is, did not bring back three nuts) must wait until the next game to play again. Have the surviving squirrels empty their "cheek pouches" into the large brown paper bag so that they begin the next round with empty pouches.

4. Explain that as the winter season continues, food becomes harder to find in the forest. The squirrels must rely more heavily on their stored nuts. In "February," repeat steps 2 and 3, and increase the food requirement to four marked nuts. Announce that this time any marked nut counts. (The squirrels can gather marked nuts that were buried by any other squirrel.)

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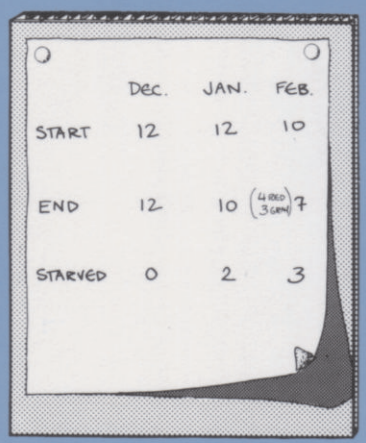
5. In "March," food is even scarcer. Repeat steps 2 and 3, but this time the food requirement is five nuts. As in "February," any marked nut counts in this round.

6. Record the number of red squirrels and grey squirrels that survived the three months of "winter."



	DEC.	JAN.	FEB.
START	12	12	10
END	12	10	(4 RED, 3 GRY) 7
STARVED	0	2	3

CRACK QUESTIONS

1. What were the advantages and disadvantages of hiding all your food in one place? In many places?

2. Was it easier to survive as a red squirrel or as a grey squirrel? Why?

3. In "February" and "March," how many of the survivors brought back nuts that were hidden by other squirrels?

4. How do you think a squirrel (or jay) relocates the food it has hidden?

5. What do you suppose happens to nuts that are not found? (They could sprout and grow.)

6. Storing food is only one type of winter behavior. What other behaviors help animals survive the harsh winter months? (Migrate, hibernate, fatten up, burrow down, become less active.)

ONE MORE WINTERTIME

Play another game, but this time choose two kids to be hungry jays that can snatch *any marked* nuts that they find unattended. Because real jays can carry only one nut at a time, permit each "jay" to carry off only one nut at a time. Place a plastic bag as a "cache" for each jay at the edge of the squirrel forest. Have the youngsters pick out the nuts they marked for the first game and let each youngster decide whether he wants to be a red squirrel or a grey squirrel. Have the jays turn their backs while the squirrels store their nuts. Play three months and tally the results on the data board as before. How did the jays change the results? Did the jays have any trouble surviving?

MORE NUTTY IDEAS

1. Set out some nuts or seeds and observe what happens to them over a period of several days. Can you observe any animals taking or storing the food?

2. Look for evidence of squirrel food-gathering behavior in the fall: stripped pine cones, mushrooms set out to dry, or opened acorns or other nuts. Can you locate a squirrel's cache?