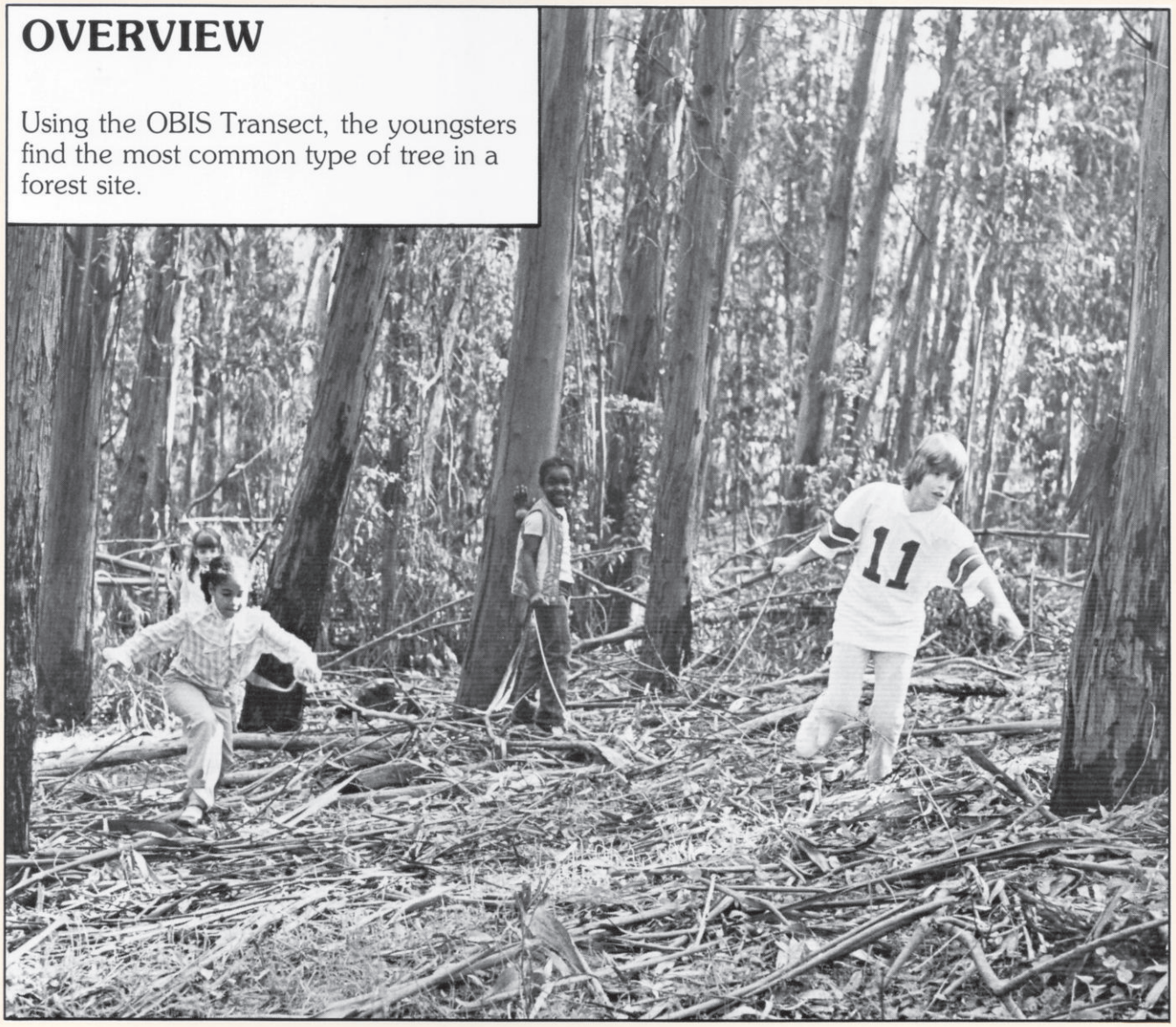
TREE TALLY

BIO KEY

Plant Investigation
OBIS Transect
Tree Histogram

OVERVIEW

Using the OBIS Transect, the youngsters find the most common type of tree in a forest site.



BACKGROUND

A *forest* is a large area of land covered with trees. Smaller tree-covered sites are often called *woods*. Although the term *forest* brings to mind large numbers of trees, few visitors to forests realize how many different kinds of trees there are. About 600 species of trees have been identified in the forests of the eastern United States. Hundreds more species live in western forests and in the tropical forests of Hawaii and Florida. A ***species*** is a group of organisms different from all other kinds of organisms.

The ***straight line transect*** is a standard sampling technique used to estimate how many plants of various species live in an area. The procedure involves identifying and counting the plants that occur along a randomly selected straight line. The OBIS Transect uses a zigzag variation of the straight line transect to estimate the number of different kinds of trees and their frequency of occurrence in a forest.

A ***histogram*** is a simple graph used for recording the frequency (number of times) that something occurs. In this

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activity, the youngsters make a histogram to record the numbers of different tree species found.

MATERIALS

For each team of two:

For Part One:

1 30-meter length of twine* wound on cardboard*

1 paper or plastic bag* for holding leaf samples

For Part Two:

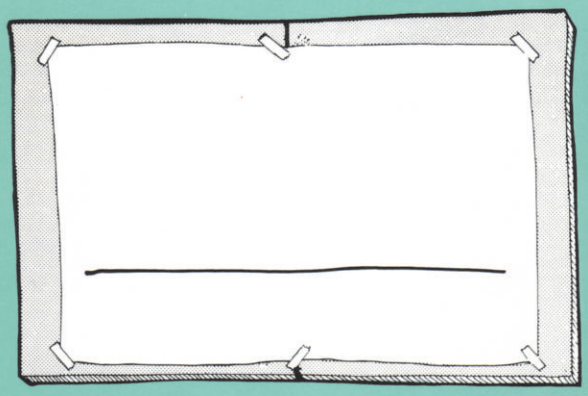
1 4-meter length of twine* wound on cardboard*

For the group:

flagging* (cloth or plastic strips)

1 meter tape* or meter stick* for measuring the twine

2 data boards* (taped together) with a line drawn 15 centimeters from the bottom



masking tape* for taping the data boards

1 marking pen*

Optional:

a guide book for identifying local trees

* Available from Delta Education.

PREPARATION

Group Size. This activity works best with groups of up to 16 youngsters. We recommend splitting larger groups into two groups with separate leaders, sites, and materials.

Time. Plan on forty to sixty minutes for this activity. Part One takes about thirty minutes, and Part Two about twenty minutes.

Site. Choose a densely forested area with at least four fairly abundant species of trees. The trees should be no more than 2 meters apart. (If the trees in your area are farther apart, increase the length of the twine listed in the "Materials" section to 40 meters and 5 meters respectively.) Avoid sites with lots of poison ivy or poison oak. For the histogram exercise, select a central location around a picnic table, or around a tree from which you can hang the data boards.

Materials

1. Measure out the lengths of twine and wind them on large pieces of cardboard.

2. Tape the data boards together and draw a line across the boards 15 cm from the bottom.

Starting Trees. Before meeting with your group, flag a tree for each pair of students in your group from which the teams will begin their OBIS transects. These trees should be at least five meters apart, and any kind of tree will do.

PART ONE CHALLENGE: USE THE OBIS TRANSECT TECHNIQUE TO FIND THE MOST COMMON TREE IN YOUR FOREST AREA.

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ACTION

1. Ask the group to guess how many different kinds of trees are in the area. Accept all guesses. Say that you don't know either. Then tell the youngsters that they will use an OBIS Transect to find out. Explain that a *transect* is a sampling technique for estimating the number of trees in an area.

2. Explain that the object of the OBIS-Transect technique is to touch as many trees as possible with a 30-m length of twine. The rules are:

a. The twine must be laid out in one general direction. Zigzagging is expected, but moving back toward the starting line is *not allowed*.

b. Trees included in the transects must be at least as tall as the youngsters: no knee-high saplings are allowed.

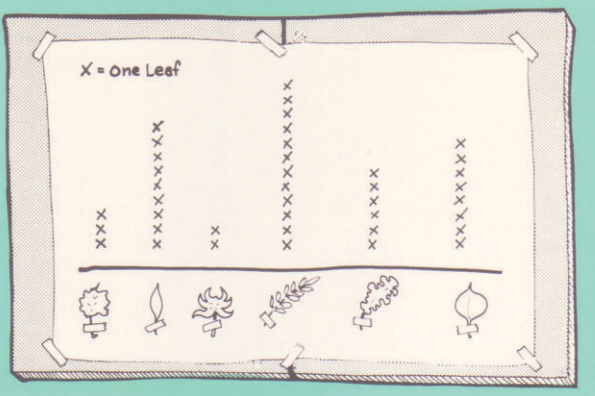
3. Demonstrate the OBIS-Transect technique with the help of a youngster. Tie one end of the 30-m twine to a tree trunk and zigzag from tree to tree in one general direction, pulling the twine taut as you go. When you run out of twine, tie the end of the twine around the last tree in your transect.

4. Divide the group into teams of two. Give each team one 30-m length of twine. Assign each team to one of the starting trees that you flagged. Point the teams in the same direction to avoid tangled lines, and let them run their OBIS Transects.

5. After all the teams have secured their lines, ask the youngsters which *kind* of tree they think is the most common in the forest. Let the youngsters describe the kinds of trees in any way they can.

6. Give each team a paper or plastic bag. Ask each team to go back along its transect line and to pick one leaf from each tree touching the line. If they can't reach a leaf on a tree, the youngsters may have to find the *same kind* of leaf on the ground or on a smaller tree.

7. After the youngsters have collected one leaf from each tree, call them together around the central data-board location. Tell the youngsters that they



can use the leaves they have collected to find out which kind of tree is most common in the area. Ask the kids how they can tell if one leaf is the same kind as another. Let the youngsters decide on their own criteria. You might suggest looking at shape, edge pattern (smooth or jagged), and surface texture (hairy, smooth, or sticky).

8. Instruct the teams to sort their leaves by tree type into separate piles.

9. Ask one team to hold up a leaf from the most common tree in its transect. Tape that leaf under the line on the data boards, and have all the teams report how many leaves like it they collected. In a vertical column above the leaf, mark an "X" for each matching leaf collected by the teams. (Make the "X's" the same

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size.) Have the teams repeat this recording procedure for each kind of leaf they found. Let the teams take turns offering leaves for the histogram.

10. After all the leaves have been counted and recorded on the data boards, tell the youngsters that they have made a histogram representing an estimate of the numbers of different kinds of trees in the area. Ask the youngsters to look at the histogram and tell you how many kinds of trees they found in the forest. Define ***species*** for the group. (See the "Background" section.) Add that the histogram indicates not only the number of species of trees that the youngsters found with their transects, but also the frequency with which each species of tree occurs in the forest. Ask which tree species is most common.

11. Have the teams rewind their twine onto the cardboard.

PART TWO CHALLENGE: SELECT ONE SPECIES OF TREE, AND RUN A FOREST LEAP FROG RACE BETWEEN TREES OF THAT SPECIES.

ACTION

1. Designate a group starting line and finish line about 50 meters apart. Use the 30-m lengths of twine for the starting and finish lines.

2. Demonstrate the game with one youngster.

a. Each team of two selects one kind of tree, for example, Red Oak. Two or more teams may choose the same kind of tree.
b. Each member of the team must hold onto one end of the 4-m (or 5-m) length of twine throughout the race.
c. Both members of the team start with their hands on the same Red Oak.
d. At the signal "Go!" partner A moves to another Red Oak, while partner B remains touching the starting tree. As soon as partner A touches the second Red Oak, partner B lets go of the starting tree and looks for a third Red Oak. (Remember that neither partner may let go of the twine.)
e. The game continues until all the teams reach the finish line or get "stuck," unable to leap-frog to another tree.

3. Give each team a 4-m length of twine and let them choose a starting tree.

4. Run the race a number of times. Encourage the teams to use a different kind of tree for each race.

TALLYING THE RESULTS

1. What kind of tree did the winning teams choose? According to the histogram, how common are the trees chosen by the winners?

2. Do you think OBIS Transects and histograms made in other parts of the forest would look like our histogram? Why or why not?

BRANCHING OUT

Go to another part of the forest. Give the teams a few minutes to look carefully at the trees and to choose one kind for another game of Forest Leap Frog. Run a few races and compare the results with the races run at the first site.