TREE TALLY

BACKGROUND

We often visit a forest and can't see the trees for the *forest*. However, if we look carefully, we can often find a wide variety of trees obscured by the rich blend of foliage.

The *line transect* is one sampling technique for sorting out the varieties and numbers of plants in an area. The procedure consists of counting the plants and the kinds of plants along a straight line.

The *area quadrat* is a second sampling technique for sorting out the varieties and numbers of plants in an area. The procedure consists of counting the plants and the kinds of plants in a defined area. The area size relates to the size and number od planst and species of plants in an area. Use a square decimeter for a lawn, square meter for a weeded area, and a square decameter for a wooded area..

In Part One of *Tree Tally*, the students use a variation of the line-transect technique to investigate a forest site. They first set out lines in a zigzag pattern, and then take leaf samples from the trees along the lines. With their samples they make a simple graph or *histogram*, which organizes the leaves so that the students can determine the number and varieties of trees in their site. In Part Two, the students run a Forest Leap Frog race based on this information.

MATERIALS

For each team of two:
For Part One
1 30-m length of string wound on cardboard
1 paper or plastic bag

For Part Two:
1 4-m length of string wound on cardboard
See the "Preparation" Section.

For the group:
2 data boards (taped together) with a line drawn 10 cm from the bottom
1 marking pen
1 roll of clear adhesive tape

Selecting a site:

Choose a densely forested area with at least four different kinds of trees. The trees should be no more than 1.5 to 2 meters apart. If the trees in your area are farther apart, you can increaser the length of the strings mentioned in the "Materials" section to 40 meters and 5 meters. (See Part One, step 2, and Part Two, Step 2b in the "Action" section.)

CHALLENGE: PART I

Find the most common tree in your forest area.

ACTION: PART I

1. Ask the group to guess how many kinds of trees are in the area. Then tell the students that they will use an OBIS transect to find out how many kinds of trees are in the area.
2. Demonstrate the following **Transect** procedure with one of the students.
   a. Tie one end of the 30-m string (of 40-m string) to a tree. The tree should be taller than the student.
   b. Begin unwinding the string and move to the next tree, which must be only one step or leap away from the first tree. (If you had to increase the length of the string, the trees can be two paces apart.) Find a likely tree, jump to it, and pull the string taut. The string must touch the new tree. Wrap the string around the tree if necessary. Then move to the next tree that is a leap away.
   c. Try to move in one general direction as you zigzag from tree to tree.
3. Divide the group into teams of two. Give each team one 30-m length of string and a paper or plastic bag. Assign each team a different starting tree. Each starting tree should be at least five meters from any other starting tree. Point the teams in the same direction to avoid tangled lines and let them set up their OBIS transects.
4. After all the teams have placed their lines, ask the students to predict which kind of tree is the most common in the forest. Let the students describe the kinds of trees any way they can.
5. Tell the students that they will now count the trees included in their transects. Each team should go back along its line and pick one leaf from each tree touching the line. If they can't reach a leaf on a tree, the students may have to shake the tree to loosen a leaf. They may also look carefully at the leaves on the tree and then find the same kind of leaf on the ground or on a smaller tree.

6. After the students have finished collecting their leaves, call them together around the data boards. Tell the students they can use the leaves they have collected to find out which kind of tree is the most common. Ask them how they can tell it one leaf is the same king as another. Let the students decide on their own criteria, but you might suggest looking at the leaves' shapes, edges (smooth or jagged), and surface textures (hairy, smooth, or sticky).
7. Instruct each team to put each type of leaf into a separate pile.
8. Ask each team to hold up one leaf that they think is from the most common tree. 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, make and X for each matching leaf collected. Make the X's the same size. Have the teams repeat the recording procedure for each kind of leaf they found.
9. After all the leaves have been counted and recorded on the data boards, tell the students they have made a *histogram* of the trees in the area. Ask the students to look at the histogram and tell you how many kinds of trees they found in the forest. Which tree is the most common? How do their original predictions compare with the results?
10. Have the teams rewind their 30-m strings onto the cardboard

CHALLENGE: PART II

Select one type of tree and run a forest leap frog race between trees of that type.

ACTION: PART II

1. Designate a starting point and a finish line about 50 meters apart. Use a 30-m string for the finish line.
2. Demonstrate the game with one of the students.
   a. Each team of two selects one kind of tree, e.g., red oak. Two or more teams may choose the same kind.
   b. Each member of the team holds onto the opposite ends of the 4-m (or 5-m) string *throughout the race*.
   c. Both members of the team start at the same red oak. They should both be touching the tree.
   d. At the signal "Go!", partner A moves to another red oak, while partner B remains touching the starting tree. As soon as partner ! touches the second tree, partner B lets go of the starting tree and looks for a third red oak. Remember that the string limits how far the partners can "leap-frog" to the next tree.
   e. The "leap frog" continues until all the teams reach the finish line.
3. Give each team a 4-m string and let them choose a starting tree. Make sure the starting trees are about the same distance from the finish line.
4. Run the race a number of times. Encourage the teams to use a different kind of tree for each race.

BRANCHING OUT

1. What kind of tree did the winning teams choose? According to the histogram, how common are the trees chosen by the winners?
2. Would a histogram for other parts of the forest look like our histogram? Why or why not?
3. If we came back in fifty years, how might our OBIS transect and histogram be different?

FOLLOW THROUGH

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.

WHAT TO DO NEXT

Leak Living
Fly a Leaf
Pigment Puzzles
Plant Patterns
Bean Bugs