

## OVERVIEW

By "flying" and racing leaves along lines, the youngsters find out which leaves catch the most wind.



# FLY A LEAF

**BIO**  
**KEY**

Plant Investigation  
Wind/Physical Factor  
Leaf Race



## BACKGROUND

A strong wind can take all the fun out of many outdoor activities. But *Fly a Leaf* takes advantage of a windy situation, and the kids will cheer the wind instead of hiding from it.

Wind is a physical or environmental factor that exerts a force on everything in its path. Animals can usually escape strong winds by moving to a sheltered place, but plants cannot move to avoid the wind. The amount of wind-force a plant can withstand is partly determined by the number, size, shape, and flexibility of its leaves. The more wind individual leaves catch, the greater the total force on the whole plant and the greater the potential damage to the plant. Leaves are the primary food-producing structures of most plants. If leaves are not able to stand fast against the force of the wind and are blown away, the plant loses its major source of food.

In consistently windy areas, the wind can modify plant growth patterns and shapes. For example, strong winds are largely responsible for the dwarfed appearance and one-sided growth of trees in high mountain regions. In coastal areas, particularly near rocky headlands, the gnarled, twisted trunks and molded canopies of trees such as the Monterey cypress are living works of wind sculpture. Even in areas that usually have mild winds, trees and other plants may be injured or toppled by heavy winds during a storm.

**CHALLENGE: "FLY" LEAVES  
ALONG A LINE TO DISCOVER  
WHICH LEAVES CATCH THE MOST  
WIND.**

## MATERIALS

### For each team of two to four:

- 2 poles (the thickness of a broomstick) 1 meter long or longer
- 1 plastic soda straw\*
- 1 six-meter length of 40 lb. test monofilament nylon fishing line\* (braided string does not work)
- 1 small piece of cardboard\*
- 1 roll of clear tape\*

### For the group:

- 1 spool of thread\* or light string\*
- 1 pair of scissors\*
- several hammers, rocks, or boards (for driving poles into the ground)

\* Available from Delta Education.

## PREPARATION

**Group Size.** This activity is suitable for small to medium-sized groups of up to sixteen youngsters.

**Time.** Plan on forty to fifty minutes for this activity. The day *must* be windy.

**Site.** Select a large, flat lawn with a wide variety of trees, bushes, and grasses from which to pick leaves.

### Materials

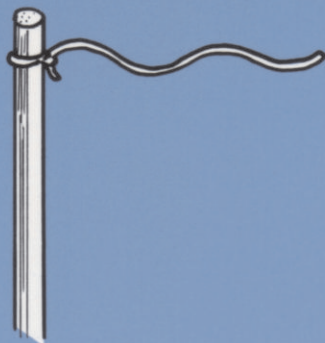
1. Sharpen the poles at one end so they can be driven into the earth.
2. Cut the plastic soda straws into four or five pieces each.
3. Cut the 40 lb. test monofilament fishing line into six-meter segments. Wind each segment around a small piece of cardboard.



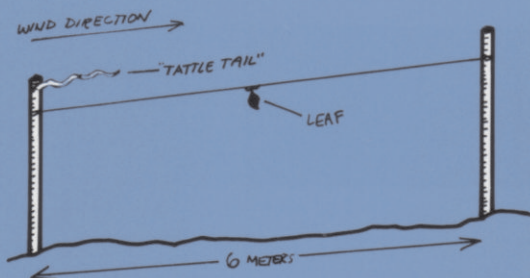
## ACTION



1. Tell the group that one environmental factor that plants must be able to withstand is wind. Plants that cannot withstand strong winds are unable to survive in windy areas. Ask the youngsters to notice how the wind moves the leaves on the plants in the area.
2. State the challenge: "Discover which leaves catch the most wind." Set up a "leaf line" and show the youngsters how to use it.
  - a. Slide four straw sections onto a six-meter length of fishing line.
  - b. Securely tie the ends of the fishing line to two poles.
  - c. Tie a short length of thread or light string (about 20 cm long) to the top of one pole as a wind indicator ("tattle-tail").



- d. Pick a windy spot, and drive the pole with the tattle-tail into the ground. Stretch out the line by moving downwind with the other pole. Position the pole so that the fishing line runs in the same direction as the tattle-tail. Drive the second pole into the ground so that the fishing line is tightly stretched.



- e. Tape a leaf to a straw section. Mention that a leaf can be attached by its "stem" (petiole) or by the base of the leaf blade. The leaves will fly faster if they are positioned so that they face directly into the wind.



- f. With the group standing on either side of the leaf line so they don't block the wind, fly the leaf down the line several times. Mention that by observing the tattle-tail, the youngsters can keep track of the wind direction. The downwind pole can be moved to keep the leaf lines aligned with the wind.
  - g. Caution the kids to be careful not to run into the flight lines.
3. Divide the group into teams of two to four youngsters. Give each team one unassembled leaf-line setup, a roll of tape, and some thread or string. Ask the teams to assemble their leaf lines and then to practice flying leaves of many different sizes and shapes. Circulate among the teams, encouraging them to select leaves that look like fast "fliers" from the surrounding plants. Tell the kids that there will be a "fly-off" at the end of the session: Each team will enter its fastest leaf in a race to find out which leaves are fastest. Allow twenty minutes for free exploration.
  4. **The Fly-Off.** Set up two or three leaf lines parallel to one another. Ask each team to bring its fastest leaf. Several heats may be necessary to determine the winners. (The fly-off is usually quite exciting.) Ask the kids to suggest which

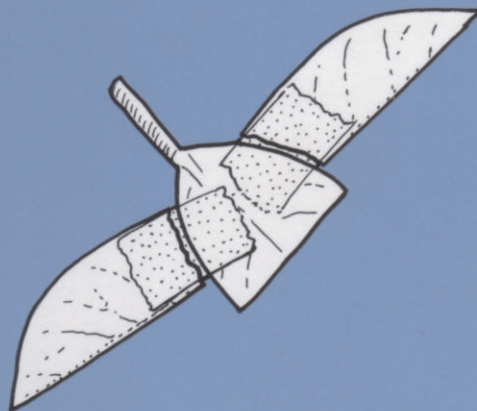
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features of the leaves make them fast or slow fliers (for example, shape, size, thickness, or flexibility).

## BLOWIN' IN THE WIND



1. Ask the teams to look at the winners of the fly-off on the plants they came from. Compare the movement of those leaves to the movement of leaves on other plants.

2. Did the leaves tend to "fly" faster when they were taped by the stem or by the base of the leaf blade? Why?

3. Do the leaves move in ways that enable them to avoid being hit by the wind's full force? How?

4. Compare the leaves on plants that live close to the ground (partially protected from the wind) with the leaves on plants that are taller than people (fully exposed to the wind's force).

2. Find out which type of leaf is blown to the ground after a big wind storm.

3. Does wind influence the shape of plants? As a group, determine the direction of the prevailing wind by observing the appearance of local plants. Check your area for trees and shrubs that are rounded off, or for trees with branches on only one side.

4. Can wind be beneficial to plants in any way? Ask the youngsters to think about such things as seeds or pollen blowing in the wind.

5. In the autumn, you can play a game with falling leaves. To observe how leaves fly when they are free, play "catch a leaf." At the signal "GO!" everyone tries to catch three leaves before the leaves touch the ground. Sound easy? Try it! Are "fastest" leaves the hardest to catch? Are small leaves easy to catch? Have the youngsters fly hardest-to-catch and easiest-to-catch leaves on their leaf lines to find out if there is a relationship. As the kids are gazing up into the branches, encourage them to watch for birds, squirrels, and other animals. How do the animals respond to the wind?

## BRANCHING OUT



1. Not all leaves are the same shape. Do leaves that have the same area but a different shape fly at different speeds? Ask the kids to find two leaves of the same kind and the same size. Have them make one of these leaves into a different shape and "fly" the two leaves. Any difference?

