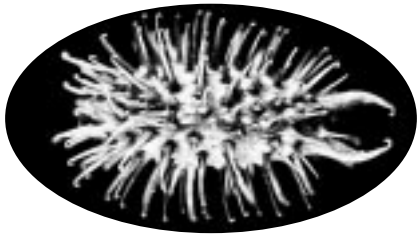
CAROLINA™
Teamed with Teachers

15-7970
Seed Dispersal Kit

Learning About Seeds That Travel

Teacher's Manual



This kit is designed for use with students in grades K–6, so there is a vast developmental range covered. Tailor the observations, activities, and suggested extensions to suit the abilities and needs of your class.

Materials

Included in the kit are seeds or fruits of the following:
milkweed
maple
basswood
cocklebur
sedge
vetch
Note: Some seed substitutions may be made if necessary.

Needed, but not supplied:
electric fan (optional)
desk lamp with a 60-W bulb
a small container of water
hand lenses

Caution: The seeds are supplied for use with the activities found in this kit only. Use of the materials by young students should be monitored by the teacher. Make sure students keep the seeds away from their nose, eyes, ears, and mouth.

Learning Objectives

The activities in this kit will give students opportunities to

- observe some seeds and fruits, noting adaptations that aid dispersal
- investigate how some seed dispersal mechanisms work

Background and Activities

Seed plants exhibit an array of striking adaptations, including features that protect them from being eaten, allow them to thrive in seemingly hostile environments, ensure that they are pollinated, and ensure that their seeds are dispersed effectively. Everyone who's blown a dandelion top has observed one of these adaptations. In addition to using wind, plants

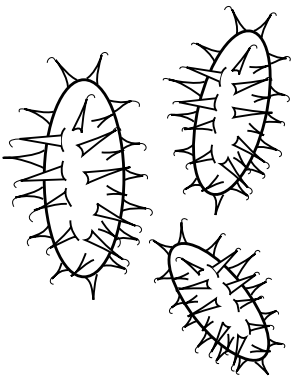
have developed ways of using animals and water to disperse their seeds. Some plants have a structural modification that actually throws seeds outward from the plant; this is referred to as mechanical seed dispersal. In some cases, a seed itself is the plant's dispersal unit, and in other cases, the entire fruit that contains one or more seeds is the dispersal unit. In dandelions, for instance, the tuft on each "seed" is actually the top part of a fruit, while the real seed is carried inside the bottom part.

Dispersal by Animals

There are two main ways that animals might carry seeds—on them or in them. In this kit, students will see a sample of a fruit that sticks to the outside of animals. Make sure students examine the cockleburs closely, preferably with a hand lens, to see the structures that enable them to stick and hang onto fur. You may want to have students dissect one or more cockleburs to try to find seeds inside the fruits.

Extensions:

- Have students collect other seeds that attach to fur or clothing and bring them in to show the class. The class can categorize the types of adaptations that make seeds or fruits stick—e.g., fuzz, hooks, or sharp points. You might also organize a sock walk, in which the students wear long, old, fuzzy socks over their pants legs and walk through an overgrown field to see what their socks collect (this works best in late summer through early winter).
- Till a narrow strip of ground at the edge of the schoolground and stretch a line or wire between two poles placed at the ends. Over time, see what grows under the line. (Birds will perch on the line and "plant" a variety of seeds.) Identify the plants and determine which ones bear fruits that are eaten by birds.



Disperal by Wind

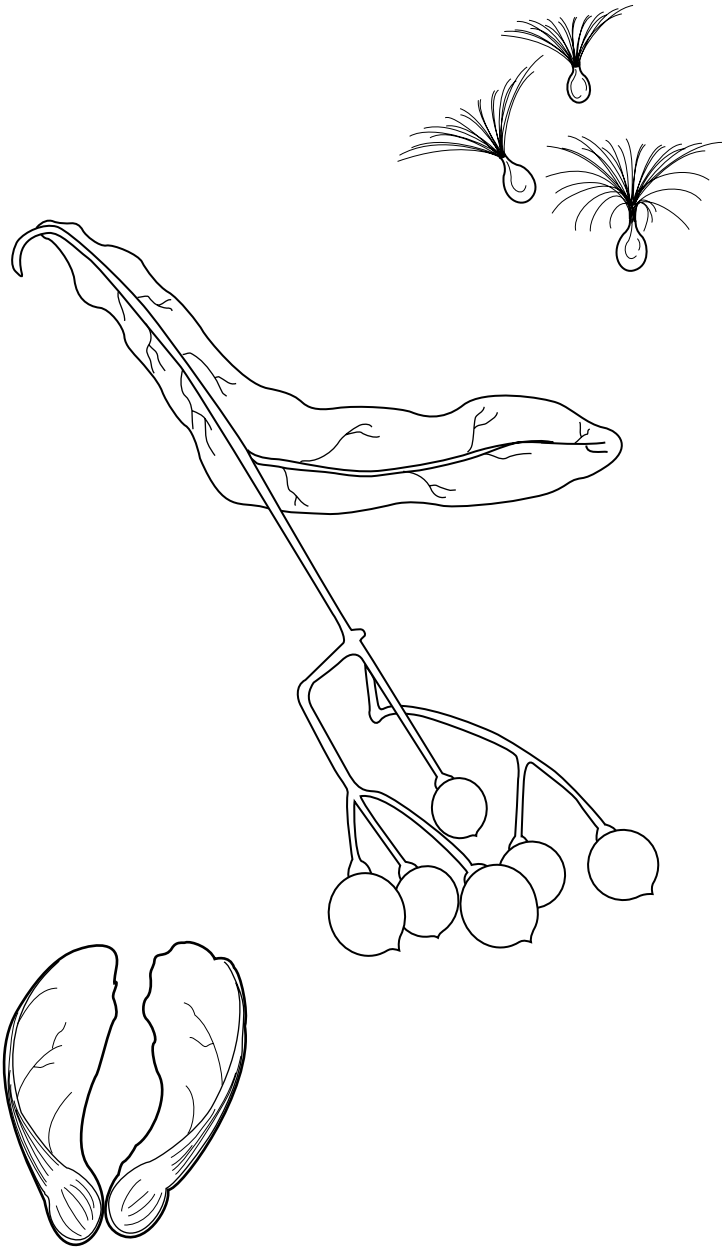
There are two main types of adaptations that seeds and fruits have for sailing in the wind—feathery tufts or flat blades. Have students carefully examine the milkweed seeds. Students can blow on the seeds and try to keep them airborne. Have them release the maple and basswood seeds from as high as they can reach. If you have a variable-speed fan, students can test how far the seeds travel at the various settings. (If you have access to an anemometer, you can directly measure the wind speed for such comparisons).

Discussion points might include the following:

- Which type of seed seems to go farther with less wind, the flat-bladed type or the feathery type? *(The feathery type tends to go farther with less wind.)*
- Find a dandelion seed head and bring it in. Have students observe and compare the structure of the tuft on a milkweed and a dandelion seed. Does the structure of the tuft seem to make a difference in the way the seeds glide?
- Have students compare the maple and the basswood dispersal units in terms of structure, placement of the seeds, and method of gliding. Does their structure seem to make a difference?
- What might be some advantages and some disadvantages of wind dispersal? *(one advantage: wide dispersal — one disadvantage: lots of seeds landing in unsuitable spots)* How might plants compensate for some of the disadvantages? *(one way: produce huge numbers of seeds so that some are bound to land in good spots)*

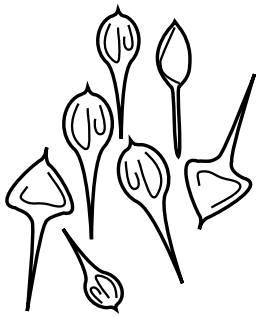
Extensions:

- Have students find other seeds that disperse by wind and bring them in for the class to examine. How many different "models" of bladed seeds and tufted seeds can you find? *(e.g., double blades, seed at one end of the blade, seed in the center of the blade)*
- Have students collect and examine some fruits or other plant structures that contain windborne seeds. Many pine seeds are bladed, and students might enjoy seeing how they are situated within a pine cone and how they come out when the cone's compartments open. Both tufted and bladed windborne seeds often occur in pods of various types that open at an appropriate time for dispersal. Various milkweeds are good examples of pods that contain tufted seeds. The trumpet creeper family (Bignoniaceae) includes several vines and trees with interesting pods that contain bladed seeds.



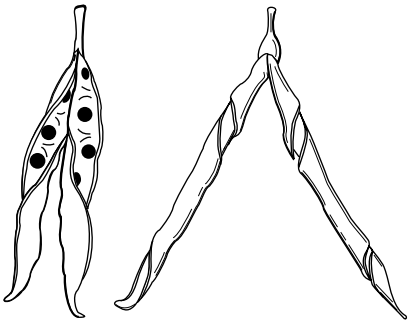
Dispersal by Water

Have students carefully examine the sedge fruits and place them in a container of water to see that they float. You may want to have students carefully dissect a few of the fruits to observe their internal structure. (Many sedge fruits contain air pockets that help float the small seeds.) Ask students to think of other seeds or fruits that might be dispersed by water. In general, the specializations for water dispersal are not as dramatic as those for wind or animal dispersion, and there is some overlap in dispersal methods. Nuts in general are often dispersed by water, but they also are planted by squirrels or they simply fall and sprout. You might ask students to think of a simple way to determine some plants that may be dispersed by water. *(e.g., walk along a waterway, look for frequently occurring plants, and test their seeds to see if they float. In the eastern U. S., black walnut trees are often found in wooded floodplains, where their large seeds have been deposited by periodic floods.)*



Dispersal by Mechanical Propulsion

Most mechanical dispersal structures involve some type of coiling. Vetch and a few other legumes (pod-bearing plants of the pea family) exhibit a form of mechanical seed dispersal that is activated by drying. The pod occurs in two halves. As a ripening pod loses moisture, the inner tissue of each half of the pod shrinks faster than the outer tissue, producing tension between the two halves. This tension finally bursts the pod open, causing each half of the pod to coil rapidly, ejecting the ripe seeds. Have students examine the vetch pods and seeds carefully and then place the pods in a container of water. After a few minutes, the two halves of each pod uncoil, revealing their original shape. If the students place the pods 6 or 8 inches away from an incandescent light bulb to dry, the pods should coil again.



Extensions:

- Have students research the seed dispersal of dwarf mistletoe, the long-distance champion of mechanical dispersion.
- Garden impatiens are a type of touch-me-not, a group of plants that expel their seeds mechanically when the ripe fruits are touched. If you or your students have access to some impatiens or some wild touch-me-nots, you might try to bring in a few cuttings with ripe fruts—of course, you must treat them very gently so as not to activate the dispersal mechanisms before you're ready to observe them

Associated Products

59-1825 20× Elementary Scope

This sturdy scope can be used indoors or out. It is excellent for viewing a variety of small objects and allows plenty of room for manipulating an object while viewing.

60-2276 Dual Plastic Magnifier, 3× and 6×

This is a good all-purpose hand lens for young children.

49-9072 FlexCam Multimedia Camera

This versatile little video camera focuses from ¼ inch to infinity. Connecting it to a classroom video monitor enables the entire class to see features of tiny objects such as seeds, flowers, or insects.

To order call:
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For technical help call:
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