



Gone With the Wind: Plant Seed Dispersal

Time needed: 10 minutes

Key Concept:
Evolution

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Introduction

Have you ever looked outside on a windy day and seen "helicopter" seeds spinning through the air? Or picked up a dandelion and blown on it, sending the tiny, fluffy seeds flying all over the place? Wind is very important for dispersing seeds to help plants reproduce. In this project you will design some of your own "seeds" and see which ones work best when they are blown across the room by a fan.

Background

Dispersal of seeds is very important for the survival of a plant species. If plants grow too closely together, they have to compete for light, water, and nutrients from the soil. Seed dispersal allows plants to spread out from a wide area and avoid competing with each other for resources.

Seeds are dispersed in several different ways. In some plants, seeds are housed within a fruit (like apples or oranges). These fruits, including the seeds, are eaten by animals who then disperse the seeds. Some fruits can be carried by water, like a coconut. Some fruits have little hooks that can stick onto an animal's furry coat (you may have gotten them stuck on your clothing if you ever went hiking in the woods).

Other seeds are dispersed by the wind – like the "winged" seeds from a maple tree that spin and helicopter through the air as they fall, or the light, feathery seeds from a dandelion. The longer a seed stays in the air, the farther it can be blown by the wind, helping the plant species spread out its offspring. In this project, you will make your own artificial "seeds" from craft materials- can you design seeds that will stay in the air for a long time?

Materials

- Examples of different seeds that are dispersed by the wind. Depending on where you live, you may be able to find some of these seeds outside. If you have access to a computer, you can also do a web search for maple seeds, dandelion seeds, and other types of seeds to help get ideas.
- Small, uniform, lightweight objects that you can use as "seeds." For example, you could use small paper clips or thumbtacks; or purchase a bag of real seeds (like sunflower seeds) at the supermarket.
- Craft supplies to build dispersal mechanisms for your seeds. These could be as simple as paper and tape, but you could also use things like streamers, cotton balls, or even things you find outside, like blades of grass.
- Scissors, tape, and glue for cutting and attaching your craft supplies to your seeds
- A window fan or large box fan.

Preparation

1. Clear an open area in the room where you will do the experiment. Place the fan on a table or chair, aimed across the room. You can also do the experiment outside on a windy day.

Procedure

1. Design and build several dispersal mechanisms for your seeds. You can use your imagination and come up with your own ideas, but here are a few to get you started (using a paperclip as an example "seed"):
 - Attach a paperclip to a small, square piece of paper, about the size of a sticky note, without making any changes to the paper
 - Attach a paper clip to another small piece of paper, but make a bunch of parallel cuts in one side of the paper to give it "frills," and bend them outward
 - Attach a paperclip to a cotton ball
 - Attach a paperclip to a cotton ball that you have pulled onto expand it a bit and make it wispier
 - Cut out some paper in the shape of a maple seed and attach a paper clip
2. Turn on the fan. One at a time, try dropping your seeds in front of the fan. Also try dropping a plain seed (e.g. a regular paper clip with nothing attached) to see what happens. *How far forward do the seeds get blown by the fan? Do certain seeds take longer to reach the ground than others?*
3. Think about your results. Did some of your designs not work at all (fall straight down, without blowing forward)? Did some work better than others? *What can you do to improve your designs? Can you make changes to your seeds to make them blow even farther?*

Extra: have a friend use a stopwatch to time how long it takes the seeds to hit the ground. This might be easier if you drop the seeds from a higher location (have a tall adult drop them, stand on a chair, or drop them from the top of the steps).

Extra: use a tape measure to record how far the seeds travel horizontally from where you drop them to where they hit the ground. Which seeds go the farthest?

Extra: how do your results change if you change the speed of the fan?

Observations and Results

You should find that adding light materials to the "seed" can make it fall slower and blow farther, however the shape of the materials is very important. For example, a paper clip attached to a crumpled-up piece of paper will still fall very fast. However, a piece of paper with a "wing" design (like a maple seed) or a bunch of individual streamers (like a dandelion seed) will fall slower and be blown farther by the fan. Exactly how far the seeds blow will depend on the strength of your fan, but you should definitely see a difference in the horizontal distance traveled between a "plain" seed and one with a dispersal mechanism. When you take your best designs and try to improve on them, you mimic the process of evolution – since the "best" seed designs in nature are the most likely to reproduce!