

## Protocol for the Cottonwood-Seed Demonstration (Teacher Master)

**Question:** Do bigger or smaller cottonwood-tree seeds travel farther in the wind?

### Materials

- Package of full-size cotton balls (1 1/4 cotton balls per student) (See Ahead of Time in lesson 3a)
- A 12-inch fan
- Butcher paper (approximately 6–7 feet or 2–2.5 meters long)

### Ahead of Time

**Note:** Complete these tasks before lesson 3a.

1. Remove two full-size cotton balls from the package. Cut one of the cotton balls in half and then in half again. The full-size cotton ball represents a large cottonwood seed, and the quarter-sized cotton balls represent small cottonwood seeds.
2. Place the fan on the floor and spread out the butcher paper in front of the fan. Tilt the fan up about 20 degrees (or to the first click on the fan). **Note:** Zero degrees would be the line perpendicular to the floor.
3. On the butcher paper, draw a line near the edge of the paper nearest the fan and label it “Tree.” You might add some branches or leaves to make it look more like a tree.

### Procedure

1. Call students table by table to sit around the butcher paper. Explain that you’re going to use a model of cottonwood seeds to investigate how far the seeds will fly from a cottonwood tree. Tell students what each part of the model represents: The butcher paper represents the ground. The fan represents the wind blowing the seeds away from the tree. The line on the butcher paper represents where the tree is standing with the seeds hanging down. The different-sized cotton balls represent big and small cottonwood-tree seeds.
2. Tell students, “Our model will help us find out whether bigger or smaller seeds will travel farther from the tree.” Then show them the large cotton ball and one of the smaller cotton balls.
3. Ask students whether they think the bigger or smaller cotton ball will fly farther in the “wind.” Elicit a variety of predictions and have students explain their reasoning.
4. Demonstrate how students will drop the cotton balls in front of the fan during the investigation.

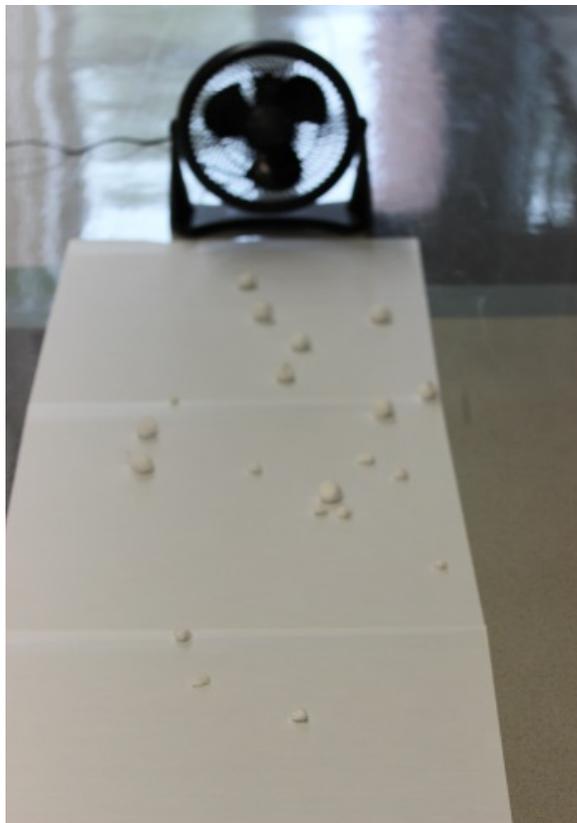


Photo courtesy of BSCS

- a. Turn on the fan. (**SAFETY NOTE:** Make sure students keep their hands a safe distance from the fan!)
  - b. Hold the **large** cotton ball near the top center of the fan, about 2 inches from the front. The cotton ball should be in the airstream.
  - c. Drop the cotton ball straight down and let it blow in the breeze. The cotton ball should travel a short distance before landing on the butcher paper.
  - d. Then hold the **small** cotton ball in front of the fan in the same position.
  - e. Drop the cotton ball straight down and let it blow in the breeze. The cotton ball may or may not travel farther than the large cotton ball before it lands on the butcher paper.
5. Explain that next time, students will take turns dropping bigger and smaller cotton balls in front of the fan, and they'll mark where each cotton ball lands on the butcher paper. After the investigation, they'll record their data on a chart and talk about which cotton balls (or seeds) traveled the farthest from the fan (or tree).