

WAYFINDER Scientific Inquiry

The following North Carolina State Science Standards are relevant to this Wayfinder:

Grade 6	1.01, 1.02, 1.04, 1.05
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Introduction

Learning to follow the scientific method is important for new scientists. Without careful adherence to the steps of the scientific method, one can not do verifiable science. The more practice that students have, the better they will be able to understand science. This Wayfinder takes you to *Catch the Wind*, our outdoor exploration environment and challenges students to perform an experiment at our Seed Tower. Keep an eye out for other exhibits around the Museum that allow students to experiment and test variables as they explore.

Before your visit

Conduct experiments and explorations in the classroom during which students follow the scientific method:

- Observe and describe the world around you
- Create an hypothesis based on your observations
- Use your hypothesis to make predictions
- Conduct a planned, controlled experiment
- Accept or reject your hypothesis after analyzing data

Review the steps of the scientific method to ensure students' understanding.

Review the meaning of the words: *independent variable*, *dependent variable* and *control*.

Review or discuss for the first time the three different methods of seed dispersal: animals, water, air. Discuss examples of seeds that use each method. For instance, some seeds are closely associated with fruit so they can be dispersed when animals eat and excrete them. Other seeds have hooks that latch on to fur. Water seeds are built to float, and seeds that use air can glide, float or flutter as the wind blows. All of these seeds use different mechanisms to detach themselves from their parent plant so they have their own space to grow. Have students begin thinking about how a seed that uses air would be built to best use the wind to its advantage. Brainstorm a few ideas.

During your visit

Visit the seed tower in *Catch the Wind*. Imagine that the tower is the parent plant to the seed that you will be creating.

Observe and describe the world around you

- 1) What method of seed dispersal does this "plant" (the orange tower) use? *Air*.

- 2) Seeds do not want to establish themselves too near the parent plant or they will be competing for resources. What would the ideal landing area be for a successful seed in this space?
- 3) Looking at the seed shapes (not the geometric shapes) provided at this station, think about how each one may fall.
- 4) Discuss as a group what questions you can ask and answer here at the seed tower.

Create a hypothesis and make predictions

- 1) Predict which seed shape will be the most successful when it falls. Make sure to think about what “successful” means to you – farthest away, neatest fall, slowest to fall, etc.

Conduct a controlled experiment

- 1) If you wanted to conduct an experiment that asked how successfully a seed fell (based on how far away it lands) what steps might you take to find this out? *If you use the data sheet given, the experiment consists of dropping each seed shape three times and recording its fall. Students can determine if they will drop the same shape three times in a row before moving to the next one, or if they will do one trial with each shape before trying the second and third trial.*
- 2) What might be the independent variables in this experiment? What might be the dependent? *If you choose to use the data sheet given, the independent variable is the chosen seed shape. The dependent variable is based on student’s definition of successful (e.g. distance from tower, slowest fall, etc.).*
- 3) What would you have to do to make sure this experiment is controlled? *If you choose to use the data sheet given, the seeds should be dropped the same number of times each. If the wind is variable, each seed should be dropped for its first trial to try to get drops at the same wind speed.*
- 4) If you choose, use the data sheet below. Have students drop and observe how each of the seed types fall. Note the location where each falls and the manner in which it falls. Drop each seed numerous times to make multiple observations. Each seed type should be dropped the same number of times.

Accept or reject your hypothesis

- 1) After conducting your experiment think about these following questions:
 - Did your predicted seed do as well as you thought? Why? Why not?
 - Which seed did the best? Why do you think it was the most successful?

After your visit.

Discuss the results of the experiment. How many students made a correct prediction? How many students had to reject their hypotheses? Is it bad to make a wrong prediction? Why or why not?

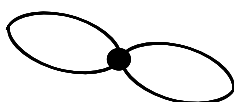
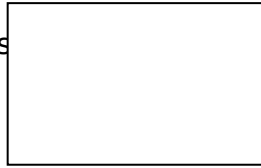
Have students share their definitions of a successful seed. Which seed was successful based on the definitions given? Did people get different answers? If so, why might that be?

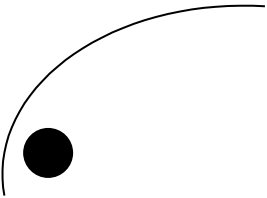
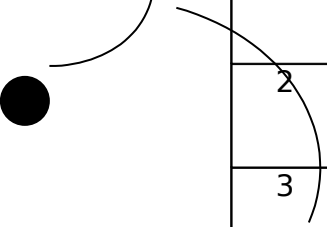
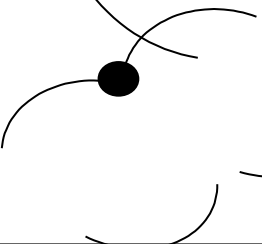
**Please see
Seed Tower Activity on next page...**

Seed Tower Activity

My definition of a “successful” seed:

I predict that this seed shape will be the most succes



Seed shape	Trial #	Describe the fall: How many steps from the base of the tower did it go (use the same person for each measurement)? Did it catch the wind or fall straight down? What other things did you observe?	Give this fall a letter grade (A-, C, etc.)
	1		
	2		
	3		
	1		
	2		
	3		
	1		
	2		
	3		

