

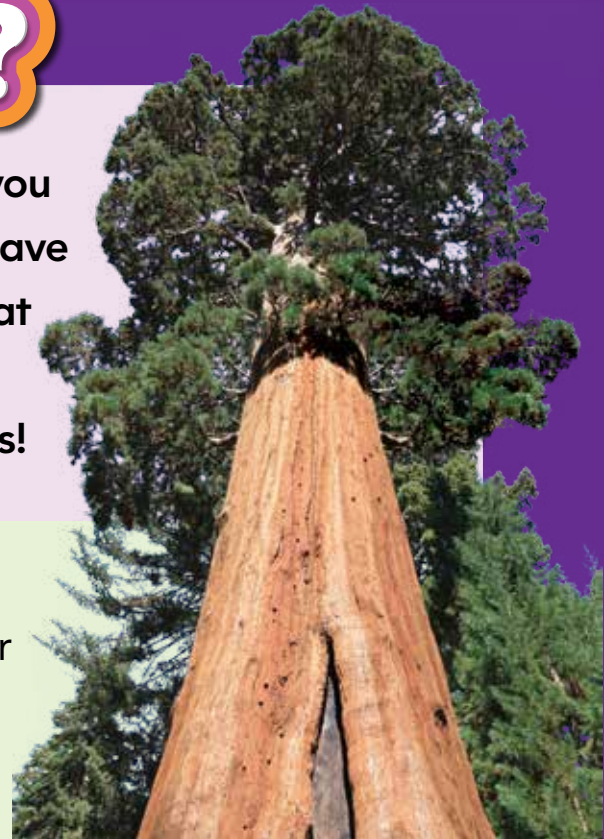
Plants



Is This a Plant?

Do you know what plants look like? Sure you do! Plants have leaves and stems. Some have flowers and fruits. And they have roots that grow underground. But plants don't all look alike. Check out these amazing plants!

This is a **giant sequoia** (seh-KOY-uh) tree. It is one of the tallest plants on Earth. Water travels from its roots all the way to the top. It takes almost a month!



Most plants grow from seeds. In many plants, like the **sunflower**, seeds develop inside flowers. Animals, like birds, eat the seeds. They help spread seeds to new places to grow.



Watch out, bugs! This **Venus flytrap** has a taste for insects. Most plants get food from soil. But this one traps bugs instead.



The **cactus** has a thick, waxy stem and leaves. These store water. Its prickly spines keep away thirsty animals.



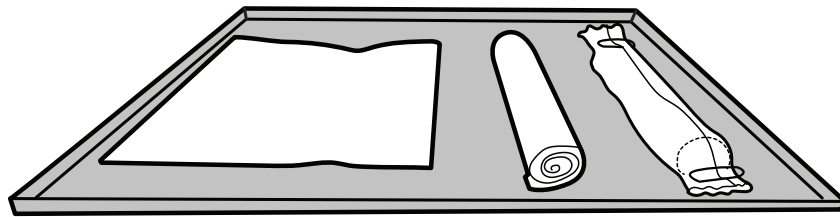
Wetter Is Better

In the hot, dry desert, plant leaves need to hold on to water. What kind of leaf stays wet in the desert? Find out here.

1. Spread out one wet towel on the cookie sheet. This is Leaf 1.

2. Roll up the other two towels. Put one on the cookie sheet. This is Leaf 2.

3. Wrap the third towel in wax paper. Use a paper clip to keep each end closed. This is Leaf 3.



4. Put the cookie sheet in a warm, dry place. **Predict:** How will the leaves change after one day? Record your guesses on your data sheet.

5. After one day, feel your leaves. How have they changed? Record on your data sheet.

6. Which leaf keeps water in best? Which would make a good desert leaf? Which would not?

Materials

- ★ 3 moist paper towels
- ★ cookie sheet
- ★ wax paper
- ★ 2 paper clips
- ★ "Wetter Is Better" data sheet

Name: _____

Wetter Is Better

1. Do Steps 1–4 of the Task Card. **Predict:** How will the leaves change after one day? Record your guesses in the chart below.
2. After one day, feel your leaves. How have they changed? Record below.

	My Guess	What Happened
Leaf 1		
Leaf 2		
Leaf 3		

3. Which leaf keeps water in best? Which would make a good desert leaf? Which would not? Write your answers on the back of this sheet.

Go, Seeds, Go!

How do seeds get to good growing places?

Try this!

1. Think: What's the first thing seeds need?

A good growing place! But how do they get there? Read "How Seeds Go" for some clues.

2. Look at your seed (popcorn kernel). How would you like it to travel? Will it glide through the air? Float on the water? Or will it stick to an animal passing by?

3. Test your seed. Can it travel the way you want? (Can it glide, float, or stick? Check it at its Seed-Testing Station.) If not, change your seed. Add something to it. What things will you use?

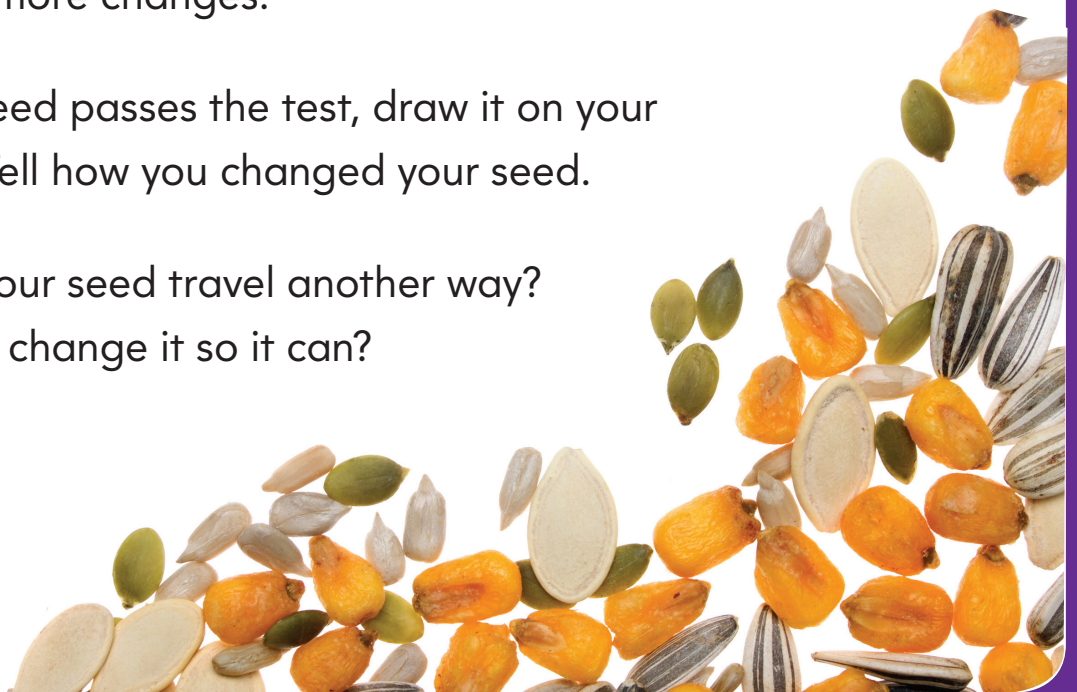
4. Test your seed again. Did your seed pass its test? If not, make more changes.

5. When your seed passes the test, draw it on your data sheet. Tell how you changed your seed.

6. Think: Can your seed travel another way? How can you change it so it can?

Materials

- ★ "How Seeds Go" chart (from your teacher*)
- ★ popcorn kernel
- ★ 3 Seed-Testing Stations (from your teacher*)
- ★ things to make your seed go (for example, tape, cotton, tissue paper, string, velcro, what else?)
- ★ "Go, Seeds, Go!" data sheet



Name: _____

Go, Seeds, Go!



1. Do Steps 1 and 2 of the Task Card. How would your seed travel?

2. Do Step 3 of the Task Card. How will you change your seed?

3. Do Step 4 of the Task Card. Tell what other changes you made.

4. When your seed passes its test, draw it in the box below.
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5. **Think:** Can your seed travel another way? How can you change it so it can? Record your ideas on the back of this sheet.

How Seeds Go



dandelion

Some seeds glide. Fluffy dandelion seeds are blown around by the wind.

Will your seed glide through the air? Put it on your hand and blow. How far does it go?



coconut

Some seeds float. Coconuts can float away in water.

Will your seed float in water? Put it in a dishpan of water. Does it float or sink?



burr

Some seeds stick. Burrs are covered with little hooks that can hitch a ride on animals.

Will your seed stick to an animal passing by? Press the seed onto a stuffed animal. How long does it stick?

Background

Scientists estimate that there are about 300,000 to 400,000 different kinds of plants on our planet. They can be as small as duckweeds, which are about a tenth of an inch long, or as large as giant sequoias, which can grow to more than 300 feet high.

Plants play an important role in our ecosystem because they are *primary producers*. In other words, they can make their own food through photosynthesis. Almost all of the food chains on our planet start with plants. Of course, humans rely on plants for other things as well, such as wood, clothing, and even medicines.

Hands-On Hints

Task Card 1: Wetter Is Better

The paper towels should be moist, but not dripping. One layer of wax paper rolled around Leaf 3 is sufficient.

After 24 hours, our flat paper towel (Leaf 1) was dry and the rolled towel (Leaf 2) was damp inside, but dry on the outside. But the towel wrapped in wax paper (Leaf 3) was still damp. Like some cactus leaves, Leaf 3 kept water loss to a minimum because of its reduced surface area and waxy covering.

After students have observed how the towels change, you may want to introduce the word *evaporation*—the process in which a liquid becomes a gas.

Task Card 2: Go, Seeds, Go!

Set up three Seed-Testing Stations around the room and have children rotate through the stations to test their seeds.

- Glide Test Station – You'll need an open space. Consider using an electric fan for a consistent wind source.
- Float Test Station – Put a dishpan of water on a desk. Place a towel or newspaper under the dishpan.
- Stick Test Station – Put a stuffed animal on a desk. Or you may substitute clothing, like fuzzy socks, for the animal.

Print copies of "How Seeds Go" (page 7 or page 15).



Next Generation Science Standards

- LS1.A** Structure and Function
- LS1.B** Growth and Development of Organisms
- LS2.A** Interdependent Relationships in Ecosystems
- LS4.C** Adaptation
- ETS1** Engineering Design

Provide a variety of materials for children to use on their seeds. Good bets include: cotton balls, pillow stuffing, craft feathers, plastic wrap, balloons, foam packing peanuts, aluminum foil, toothpicks, bits of Velcro. Don't forget tape and glue.

Why do seeds need to travel? Plants need to soak up water and nutrients to survive. But they can't walk around to get them. They have to rely on the soil in which they're growing. And they have to share the water and nutrients with other plants growing around them. What would happen if all of a plant's seeds fell right beneath it? The seeds would all sprout right around the mother plant, and there wouldn't be enough water and nutrients to go around.

For optimal results, we suggest following these steps:

1. Introduce the topic by reading aloud the nonfiction article. The article helps build background knowledge and provides context for the hands-on activities. You can project it onto your interactive whiteboard as you read it aloud. There is also a printable version that you can distribute to students so they can read along.
2. Divide the class into small groups. Hand each group a Task Card, and give each student a Data Sheet. (We recommend starting with Task Card 1.) Together with the class, read aloud the steps of the activity to ensure everyone understands what to do. You may also want to have each group conduct an inventory of their materials to make sure they have everything they need.
3. Have students do the activity and record on their Data Sheets.
4. Make sure to leave enough time before the end of the period so you can have a class discussion about the activity. Invite groups to share their findings and results, including any challenges they may have faced.
5. Gather students' data sheets to assess for understanding.

If you plan to continue the unit in your next lesson with the second Task Card, you might want to review the article with the class. In some cases, Task Card 2 builds upon Task Card 1, so you may want to quickly go over the first activity as well.

At the end of a unit, consider asking students to evaluate the topic and activities. This can be as simple as a thumbs-up or thumbs-down. Engage them in a discussion about what they liked or did not like and why. You might find this feedback useful for future lessons.

The two Task Cards feature hands-on activities that incorporate the following eight science and engineering practices—identified by the NGSS as essential for all students to learn:

1. Asking questions and defining problems
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics and computational thinking
6. Constructing explanations and designing solutions
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating information

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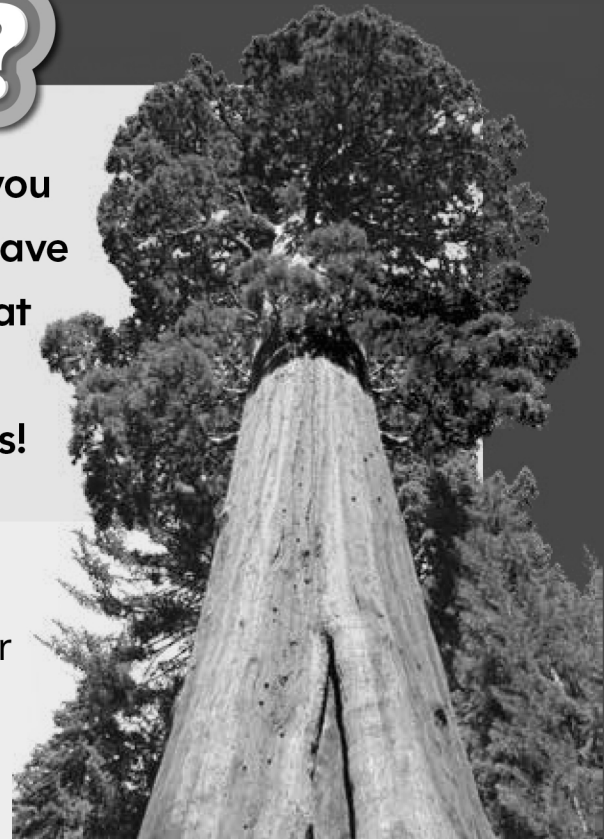
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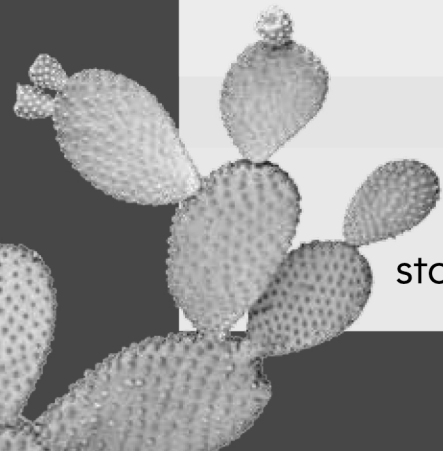


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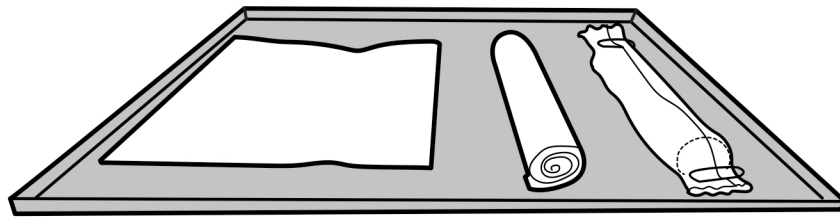
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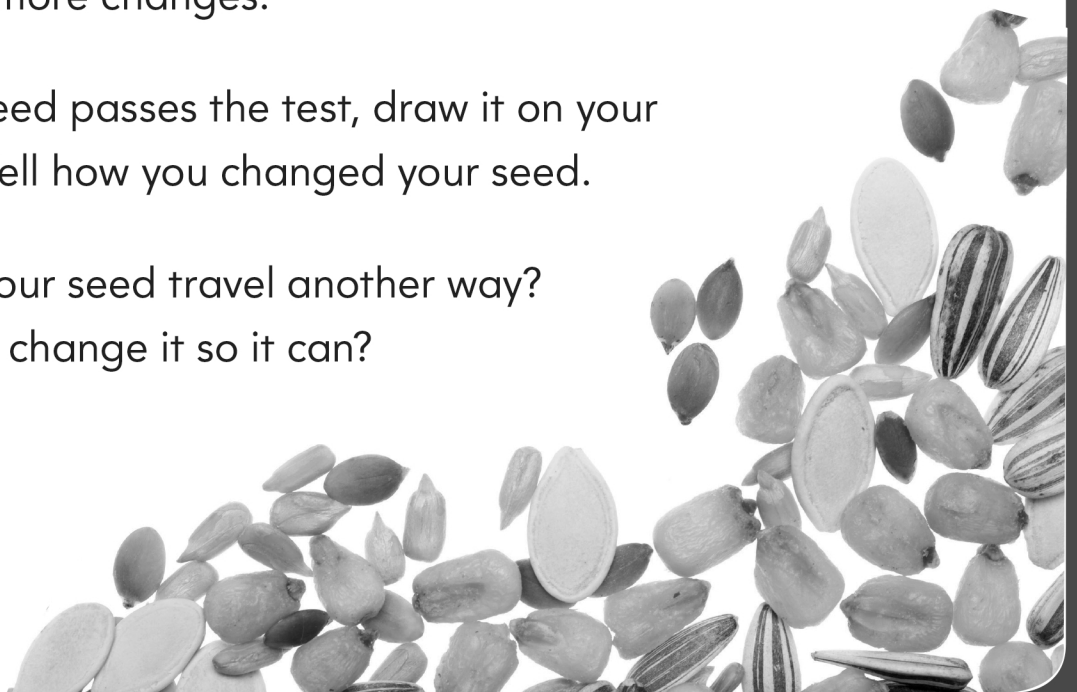
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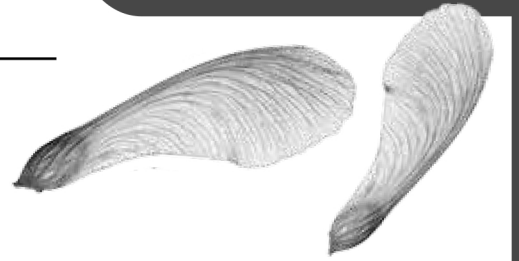
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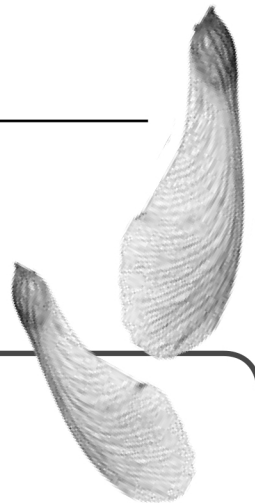
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