

INV. 1 ACTIVITY—PLANT PARTS IN THE KITCHEN

Review

You may have looked at the seeds found in bean pods, and other fruits and vegetables. If you did not get to do that, as you eat fruits and vegetables, do some counting of how many seeds are in each. If a guardian is cutting up peppers, cucumbers, tomatoes, kiwi, papaya, mango, or avocado take a moment to ask them if you can count the seeds before they compost or discard seeds that aren't eaten. Also count seeds in fruit you eat.

If you did not yet read "The Reason for Fruit" in *FOSS Science Resources: Structures of Life*, do that now. Go to the ebook on FOSSweb.

Investigation

Speaking of things you eat, let's do some investigating. Do you eat any plants at home? How about parts of plants? What are the parts of plants that you eat?

Start paying attention to the things you eat. For example, look at this carrot. What parts do you see? Which part of this plant do you eat? Do you eat the leaves, the stalk, or do you eat the root?

At home over the next week, keep a log of what plant parts you eat. You may need to do some research to find the answer to some of your questions about the foods you eat.

Fill in the following list as you eat various things. List the food and what part of the plant it is.

Seed: ____ I ate sunflower seeds from a sunflower _____.
(example)

List as many as you can of each:

Seed: _____.

Stems: _____.

Flowers: _____.

Roots: _____.

Leaves: _____.



Follow up activities:

- Go for a walk with a family member stop at a handful of plants. Can you see the plant roots, the stem, leaves, flowers, or seeds? Can you find a plant that shows ALL the parts of a plant at one time?
- Talk to family members (a grandparent) about we important foods for them when they were growing up? What part of the plants did they eat? Record this in your notebook.

INV. 1 ACTIVITY—SPROUTING SEEDS IN A JAR (PAGE 1 OF 2)

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Review

You may have done a seed search, looking at bean pods and other fruits and vegetables. You counted seeds in these fruits and vegetables. You may have also set up a mini sprouter. If you did not do that here is a summary of what we would do if we were in school. Place some seeds—pea, bush beans, sunflower, and popcorn—in a coffee filter and then inside a container. We would soak the seeds and drain out the water—every few days we would water the seeds and watch the growth over time.

Project

Look around your home for the following materials:

- a jar with a lid (a mason jar or empty and clean spaghetti sauce jar is great.
- some kind of cloth—cheese cloth, or fabric (an old t-shirt or even clean/thin sock will do)
- thickest rubber band you can find (that will fit over the opening of the jar—if you have a mason jar you won't need it)
- seeds (one of the following): alfalfa, dried chick peas, dry lentils, dried mung beans, mustard seeds, clover, dried peas, wheat seeds (these may be in your home already and can be found at the grocery store)
- tablespoon
- water



Action:

- 1) Write down any questions you have about the seeds you selected. Draw what they look like now.
- 2) **Focus question: What effect does water have on seeds?**
- 3) Measure one tablespoon of the type of seed you selected in the jar.
- 4) Pour enough water to cover the seeds, let them soak for about five minutes
- 5) Cover the jar opening with whatever filter you have—cloth, cheese cloth, thin old sock (get permission before cutting anything). If using a mason jar, screw the outer part of the lid back over the fabric. If it is a spaghetti sauce jar, wrap the strong rubber band around the fabric to secure it in place.

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INV. 1 ACTIVITY—SPROUTING SEEDS IN A JAR (PAGE 2 OF 2)

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- 6) After five minutes, and after securing the covering so the seeds will not fall out, drain out the water. Keep the jars in a darker place out of direct sunlight.
- 7) Give the seeds a rinse every day and drain them soon after. Observe and draw the changes in your notebook.

Remember to date your entries. Label the parts of your drawings. Note what happens first, second, etc.

Write about what function you think each structure has.

After about two weeks, or when the sprouts are a few inches long, with your guardian's permission, you and your family can eat them.

End this investigation by responding to the focus question.

Follow up investigations

- Try other types of seeds
- Plant seeds in soil that you can grow inside, like basil or other herbs.

INV. 1 ACTIVITY—EXPLORING SEED DISPERSAL (PAGE 1 OF 2)

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Review

In school you may have done some activities with seeds, and you may have even done this activity called Seed Dispersal. If you did this before, challenge yourself to create a different design and decide which design is better. Most engineers create multiple models before deciding which is the best.

After a seed starts to grow it needs water, light and nutrients. Sometimes the baby plant tries to grow right beneath the parent plant. When that happens the baby plant has to compete with the larger plant?

Date a new page in your notebook and respond to the following questions:

1. What might happen if all seeds dropped together right underneath a parent plant?
 - If all the seeds dropped right below a parent plant then _____.
2. What would improve the new plant's chance to survive? _____
3. What do seeds need to grow? _____

Write responses to these questions in your notebook.

Focus Questions: How do seeds disperse away from the parent plant?

Sometimes humans, such as farmers and gardeners, spread seeds, but how do plants disperse (spread out or move away from) their seeds without human help?

View Streaming Video on FOSSweb—*How Seeds Get Here... and There*

On FOSSweb, in your Media Library, watch the streaming video, *How Seeds Get Here... and There*. Think about how seeds move from place to place. You may use these ideas in your designs.

Materials

- 6 Dried seeds (black beans, black-eyed peas, or something similar in size)
 - Random materials around house and in recycle bin such as empty cereal boxes or old envelopes Use what you have such as: craft sticks, pipe cleaners, paper clips, rubber bands, cotton balls, Q-tips, twist ties, string, tooth picks, colored paper, fabric scraps, bubble wrap
 - Any natural materials found outside
- 1 Container filled with water (see Challenge A on the next page)
 - Scissors and tape

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INV. 1 ACTIVITY—EXPLORING SEED DISPERSAL (PAGE 2 OF 2)

Action

It is best to do this outdoors, but if you do not have permission to do so, you can do this indoors:

1. Look at the dried seeds you have. You are going to do the work of an engineer to make a physical model. You are solving the problem about how seeds disperse away from the parent plant. Make your model for each challenge (A-F listed at the bottom of this page,) then test it, and redesign to improve it.
2. After you select your first challenge, draw a sketch in your notebook of what you could do to modify the seed. Then search around your house for the materials to make it happen. Begin your modification.

Test out your design at least three times. Once you feel your design meets the challenge criteria, share the challenge and your model with a family member. (A meter is about one big step for a third grader—if you do not have a meter tape you can just judge by how many big steps away it goes.)

3. Repeat the above for each of the challenges. If you cannot do all of them, try and do at least four.
4. If your classroom shares using technology, take a photo each model, and share the photos with your teacher. Perhaps your classmates could guess which challenge you were trying to meet.
5. In your notebook, share your results and how you how you met each challenge. If you had problems, share those and how you might redesign to overcome the problems.. Engineers often struggle to solve problems, but they learn from these failures.
6. When you are done, respond to the focus question.

Seed Dispersal Challenges

- A: Modify your seed to float on water for 4 minutes.
- B: Modify your seed to catch on an animal and be carried 5 meters.
- C: Modify your seed so it can be propelled at least one meter from the parent plant (remember plants do not have hands!)
- D: Modify your seed so that it may glide at least one meter from the parent plant when it is dropped.
- E: Modify your seed to attract the attention of a bird or another animal.
- F: Create your own solution to transport a seed away from the parent plant.