



## Seed Exploration

### Connected Next Generation Science Standards

- 2-LS4-1** Make observations of plants and animals to compare the diversity of life in different habitats.
- 4-LS1-1** Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

### Featured Science and Engineering Practices

Obtaining, Evaluating, and Communicating Information

### Featured Cross-Cutting Concepts

Patterns

### Materials

- Teacher: White board or chalk board
- Acorns or other large schoolyard seeds
- Magnifying Glasses
- Cup, jar, or other container for collecting seeds
- Paper plates, cardboard, or light-colored sheets
- Garden journals or worksheet and clipboard
- Optional- additional unique seeds, small buckets of water to test seeds, colored pencils or crayons

### Overview

This lesson will reinforce students understanding of seed dispersal adaptations. Students will explore the school grounds for seeds and determine different adaptations they have for survival and reproduction. This is a great opportunity to explore native garden beds as well as vegetable gardens.

### Students will

- Observe adaptations in seeds.
- Categorize seeds by similar structures.
- Explain the different methods of dispersal in seeds.

### Teacher Preparation

- Walk through the school yard to find an area that has a variety of seeds for students to explore.
- Optional: gather additional seeds with unique adaptations - maple samaras, coconuts, milkweed seed pods, etc.

### Guiding Question - How do different seeds disperse in the garden?



## Seed Exploration

### Setting

- School garden
- Can be taught at any time of year, but best in the fall when there are plenty of plants nearing the end of their life cycle and producing seeds.

Coconuts are a fun example of water seed dispersal. Note that the coconuts you can buy in the grocery store usually do not have seeds.

### Explore

- While walking out to the garden, ask students, What about the garden environment might make it difficult for a plant to survive? (rain, wind, cold, heat)
- Adaptations help plants survive sometimes difficult weather.
- Draw students' attention to a nearby tree or plant. An oak tree is a good example to use, since many students are familiar with acorns.
- What is the first step in the life cycle of the oak tree (or other plant)? How are new oak trees made? This oak tree will drop new seeds that could grow into a new plant.
- Pick up a few acorns (or other seeds) and pass them around. What would happen if all of these acorns grew in the same space? They would be crowded and have a difficult time growing big and tall.
- Turn to a partner and discuss, How might the acorns be moved away from this spot before they grow into a new tree? (squirrels and other animals)
- Other plants need to disperse or move their seeds too. Explain that today we are going to explore the garden to find out how other seeds move to grow in different places. We are going to look at seeds' shape and structure to figure this out!
- Where should we look for seeds in the garden? Students often look in the soil for seeds. Instead, seeds will be found in fruits/pods, inside flowers, and at the top of plants.



## Seed Exploration

- Give each student a small cup for collecting seeds. They will have about 5 minutes to explore the garden and collect as many different seeds as they can find. They will be able to choose a favorite later, so focus on collecting a variety of seeds.
- Walk around and point out interesting seeds as needed.

### Digging Deeper

- Before students lose interest, bring them back together with their seed cups.
- Divide students into small groups of about 4.
- Pass out paper plates, cardboard, or sheets to each group and have them lay it out in the center of their circle to spread seeds out.
- Optional- Pass out magnifying glasses, scrap paper, pencils, and unique seeds you previously harvested or bought.
- Tell students they are each going to sort their seeds into at least 4 categories, looking for patterns. Encourage them to classify their seeds based on similar shapes, structures, sizes, and other patterns they observe. They should work together to decide on how they are categorizing seeds.
- Students then label each group of seeds based on how the seeds might travel.
- Pass out the Seed Exploration worksheet or list on a whiteboard common seed dispersal methods: **wind**, **water**, **gravity**, and **animals** (inside and outside).

A fifth form of seed dispersal is **mechanical** but is hard to observe in the garden. Seeds are flung out of a pod. Dried pea pods can suddenly split open and force out peas.



## Seed Exploration

Keep seeds to use as inspiration if you are going to do the Seed Modeling lesson.

*This lesson structure was influenced by the "Related and Different" lesson by BEETLES™ at The Lawrence Hall of Science, <http://beetlesproject.org>*

### Seed St. Louis Resources

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- Give the small groups a few minutes to debate and rearrange their seed categories, based on the new information. What structures or shapes on the seeds help them pick a seed dispersal method? Encourage students to drop seeds to see if they float in the wind, try to stick the seeds to their clothing for animal dispersal, or pass out buckets of water to test if seeds can float.

### Making Connections

- Pass out crayons or colored pencils if available.
- Students then pick their favorite seed and use their magnifying glass to make close observations.
- Give students 5-10 minutes to create a scientific seed drawing. The drawing should point out the structures of the seed that help it disperse. Emphasize the drawing is about capturing their observations, not making a pretty picture.
- As students finish their drawing, explain that scientists often collaborate with other scientists to learn from each other. They will now share their seed journal entries with another student.
- Encourage students to question and discuss how each seed would travel in nature.
- Before returning inside, students should return their seeds to the natural environment or collect and store similar seeds to plant next year.
- Ask students while walking back inside, What adaptations or seed dispersal methods do you think would work well in the schoolyard? Which dispersal methods might not work well?