

1st GRADE

SEEDS AND SEED DISPERSAL

Summary: This lab is all about seeds. First, students take apart a swollen lima bean seed and find the seed coat, food storage area, and the plant embryo. Second, the students sort a bag of seeds into groups and notice that all seeds look different but have the same three seed parts. Finally, students sort seeds that are dispersed in different ways. Students identify seeds that are dispersed by wind, hitchhiking, animals carrying and burying, and animals eating and pooping.

Intended Learning Outcomes for 1st Grade:

Objective 1: Framing questions. Conducting investigations. Drawing conclusions.

Objective 2: Developing social interaction skills with peers. Sharing ideas with peers. Connecting ideas with reasons.

Objective 3: Ideas are supported by reasons. Communication of ideas in science is important for helping to check the reasons for ideas.

Utah State Core Curriculum Tie:

Standard 4 Objective 1: Life Science

Analyze the individual similarities and differences within and across larger groups.

Standard 4 Objective 2: Life Science

Describe and model life cycles of living things. Make observations about living things and their environment using the five senses.

Preparation time: 1 hour to locate seeds the first time, then 20 min if seeds are reused

Lesson time: 50 min

Small group size: works best with one adult for every 5 students

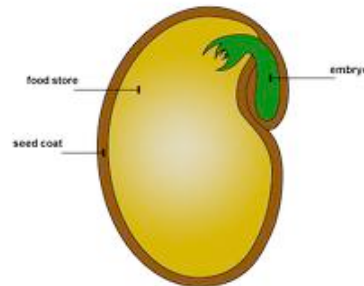
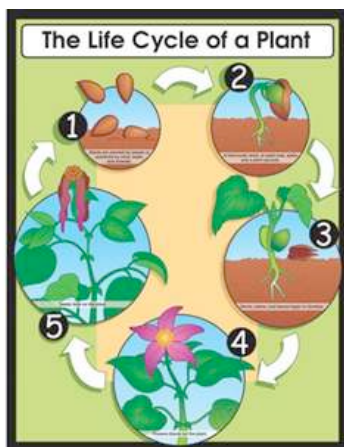
Materials:

1. one petri dish or paper towel per student
2. 1 bag of dried lima beans
3. One seed classification bag per group, this should include 5-6 seeds of about 15 different seed types. Use old seeds from seed packets or spices or seeds or nuts you may have in your kitchen. Find them in a range of sizes, colors and textures.
4. One seed dispersal bag per group, this should include at least two of each seed dispersal type. Take a walk in a place with dried seeds on the plants or on the ground. This is a great lab to do in late fall or winter after the plants have died. Look for seeds that are dispersed in different ways and put at least 2-3 of each seed type in the bag. Find them in a range of sizes, colors and textures.

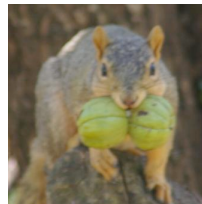
Preparation: One lima bean per student, with a few extras, needs to be put in water to swell about 24 hours before the lesson.

Background information:

A seed consists of a small plant embryo with root and leaves, a large food storage area and a seed coat for protection. A seed needs warmth, air and water to germinate. Once germinated a sprout is formed and this grows into a plant. A plant will form some type of flower and after pollinated this flower will contain seeds. After seeds are dispersed then a new plant can form. A plant has many seeds because most seeds don't grow into new plants because they get damaged or land in a place they can't survive. This is the plant life cycle.



Plants have evolved to disperse their seeds away from themselves to stop overcrowding and to create new colonies of plants. If seeds just landed underneath the parent plant there wouldn't be enough light, nutrients and water to grow healthy plants. There are multiple ways seeds may be dispersed. In this lab students will study wind dispersal, and dispersal by animals. Seeds dispersed by wind are usually smaller seeds that have wings or other hair-like or feather-like structures. Animals can disperse seeds by eating a fleshy fruit, the fruit gets digested by the animal, but the seeds pass through the digestive tract and are dropped in other locations. Some animals bury seeds to save for later, but may not return to get the seed and it can grow into a new plant. Finally, some plants have seeds that are barbed. These barbs get tangled in animal fur or feathers and then are carried to new sites.



Pre-lab discussion: Show the students a dry and swollen lima bean seed. Describe to them why the swollen lima bean seed is so large. Show them a drawing of the parts of a seed and describe their functions. Ask the students if a plant can move around a forest and place its seeds in different areas. Explain to them that plants had to evolve to find ways to spread or disperse their seeds to new locations. Ask them if they know of any ways and then describe to them the four ways they are going to study today about seed dispersal.

Instructional Procedure:

I. Seed parts – Give each student two lima beans in a petri dish. One that has been soaked in water and the other that has been kept dry. Have the students compare how they are similar and different.

1. Have each student remove the seed coat from the soaked seed and have the students investigate what is inside the seed. Students need to be careful when the seed opens that they don't lose the embryo. Have each child show the adult in the group the different parts of their seed that are also on the diagram. On the embryo, have the students point to the baby leaves and the baby root.
2. Review the parts of the seed and their purposes. Have the students explain how this baby plant is going to become a new plant. Go through the life cycle of a plant: seed, germination, sprout, plant, flower and seed again.

II. Seed classification -- Empty the seeds in the seed classification bag onto a white piece of paper. Have the students sort them by seed type. Discuss how these seeds are similar and how they are different. Emphasize that all these seeds have the same three main parts: seed coat, embryo and food storage.

III. Seed dispersal -- Empty the seeds in the seed dispersal bag onto the table and have the students sort them by seed type. Discuss why a seed needs to be carried away to a new location. Also, discuss whether each seed will grow into a new plant. Figure out which seeds travel to new locations via the following ways.

Wind dispersal - Some seeds have wings, hair like or feather like structures which allow them to be carried by the wind to a new location. (flowers, grasses, seed pods)

Animals carry and bury - Nuts are often buried by animals to store them for winter. If the animal doesn't come back to eat the nuts, they can sprout. (acorns, pistachios)

Animals eat seeds and they are discarded in their waste - Animals eat fruits or berries with the seed inside. Later when they go to the bathroom the seed is deposited in their poop and can sprout wherever it was dropped. (berries and small fruit)

Hitchhikers - Some seeds have barbs which get tangled in an animal's fur. Later when the animal brushes the seed off it will have been carried to a new location. (barbed seed)