

Germination of Soy Boy

Standards of Learning

Science K.1, K.7, K.9, 1.1, 1.4, 2.1, 2.4, 2.8, 3.1, 3.8, 4.1, 4.4

Objective

Students will:

- Investigate the germination of seeds
- Investigate plant needs

Materials

- Bean seeds – any seeds can be used, but soybeans are recommended because they are seeds that students are usually not familiar with (two seeds per student)
- Small baggie (jeweler size – one per student)
- Cotton balls (one per student)
- String or yarn cut to “necklace size” (one per student)
- Hole punch
- Water placed in bowls or cups so that the cotton balls can be soaked
- Writing utensils
- Journal for data collection

Background Knowledge

You may want to punch the holes in the jewelers’ bags and cut the string before beginning this activity. Also, you may find that this activity works best in stations.

Seeds vary greatly in germination rate, amount of time needed for plant maturity, and growing conditions. Some seeds, like radishes, only need 4-6 weeks to grow to maturity, while corn and soybeans require several months. The purpose of this activity is to provide students with an opportunity to observe the germination process. What does it look like when the sprout breaks through the seed coat? Is there a difference between dicot and monocot seed germination? How long will the seed take to grow? All of these questions are exciting to explore with students.

Germination is when the seed sprouts and begins to grow. It is important for your students to know that it starts right when there is a bud present from the seed. Explain to your students that their sprout will need a while to grow and that every plant is different in the amount it takes for them to get to maturity. Ask them what their plant will need to grow. All plants need water, light, temperature, time, soil (nutrients), oxygen, and space to grow to full maturity, which is something you can show your students as they are creating their own soy boy. However, it is important to note that the seeds do not need all of these things to sprout but they will need them to grow to maturity. The process that their plant is going to go through is also something that should be talked about and monitored for a few weeks. All plants go through about the same cycle of sprout, growth, flower, and fruit. However, it is important to also point out to your students what their plant parts are since they will not have flowers or fruits. The basic parts of the plant to point out are roots, leaves, stem, flower, seeds, and fruit. Make sure to point out that not all plants have every part.

Procedure

1. Define the term germination. “To sprout or begin to grow”



2. Show the class a variety of seeds and brainstorm what a seed needs to germinate. *This list should be comprised of the children's perceptions of what a seed needs to germinate, but guide them to include the following if they do not think of them on their own: water, air, warm temperature.*
3. Instruct the children that they will be conducting an experiment to see which things from their brainstorming list a seed actually needs to germinate.
4. Provide each student with a small baggie. Punch a hole in the top of a small baggie.
5. Dip a cotton ball in water (wring out excess).
6. Place the cotton ball inside the small baggie.
7. Place two soybean seeds in contact with the dampened cotton ball.
8. Tie a string through the hole punched in the top of the small baggie.
9. Using the string and baggie like a necklace, place the baggie under your shirt.
10. The bean should soon swell up from moisture and germinate in about 3 days.
11. Over the next 3-5 days make observations and record in a science journal.
12. Have students raise right hand and repeat the pledge.

Pledge

I, (state your name), promise to care for my soy boy day and night. I will keep him close to my heart. I will carry him with me at all times.

Extension

Have student research the origin of soybeans. When were they introduced into this country?

Once seeds have germinated, plant in plastic cups, planters, or outside for further observation.

Research the uses of soybeans and present this information orally to class.

Have students research George Washington Carver's work with soybeans. In what region of Virginia are soybeans grown?

On a map of the US, locate where soybeans are grown. Discuss how transportation has affected the types of foods available to consumers.

Experiment with germination of the soybean at different temperatures. Is your body temperature best for germination?

Read *Why the Brown Bean Was Blue* and list the various uses of a soybean. Collect items made from soy and share with the class. This book can be ordered from the Nebraska Foundation for Agricultural Awareness at www.nefb.org/ag-ed/

