Soybeans

*Lesson Plan for Grade 1, Science*

*Prepared by Michigan Soybean Association*

*Modified by Mississippi State University, School of Human Science*

*for Mississippi Farm Bureau Federation - AITC*

# OVERVIEW & PURPOSE

Observe and identify physical characteristics of soybean seeds as well as their functions.

# EDUCATION STANDARDS

**Mississippi College-and-Career Readiness Standards:**

L.1.1.1 Construct explanations using first hand observations or other media to describe the structures of different plants (i.e., root, stem, leaves, flowers, and fruit). Report findings using drawings, writing, or models.

Math-1.MD.3 Tell and write time with respect to a calendar.

**NALOs:**

T1.K-2 b Describe the importance of soil and water in raising crops and livestock.

# OBJECTIVES

* Students will observe and identify physical characteristics of soybean plants as well as their functions
* Students will grow soybeans
* Students will observe soybean growth

# MATERIALS NEEDED

* 2 sets of soybeans (one per student)
* 1 large cup
* Bag of potting soil
* 1 cup per student filled with soil

# Lesson Set Up:

1. The evening before, fill a cup with water and enough soybeans for every student. Soak the seeds for at least 8 hours.

# Vocabulary

**Seed:** a fertilized and mature egg that contains a tiny plant that grows and develops when placed in an environment containing air, water and warmth.

**Seed coat:** a thin covering that protects the seed's embryo from insects, disease and damage.

**Flower:** the bloom or blossoms of the plant; the seed-producing structure of a plant.

**Fruit:** a swollen mature flower (these are considered the fruits). Fruits normally contain stored energy and nutrients that help seeds grow during germination.

**Germination:** the process of an embryo emerging from its seed.

**Leaves:** the major site of photosynthesis where oxygen is released and carbon dioxide is absorbed.

**Roots:** the usually underground part of a seed plant body that: transports water and minerals, stores sugars produced by the plant and anchors that plant into the ground.

**Seed pod:** the fruit of plants like legumes containing many seeds.

**Stem:** stalk; a slender or elongated structure that supports a plant through which water, minerals and food are transported between the roots and the rest of the plant.

# Ag Facts:

* One acre of soybeans can produce 82,368 crayons.
* Soybean oil provides an environmentally friendly fuel for diesel engines.
* During the Civil War, soybeans were used in place of coffee because real coffee was scarce.
* 98 percent of the soybean and livestock farms in the country are still family farms.
* U.S. farmers first grew soybeans as cattle feed.
* 45 percent of the world’s soybean acreage and 55 percent of production is in the United States.
* Soy ink is used to print newspapers and textbooks.
* Soybean is used in plastics, wood adhesives and textiles.
* Soybeans also find their way into candles, cleaning products and hair-care products.
* The soybean is the highest natural source of dietary fiber.
* Farmers across the U.S. grow soybeans that have been harvested into yields of about 2 billion bushels a year.
* About half of U.S. soybeans are exported to major markets including Europe, Japan, Taiwan, Mexico and South Korea.
* More soybeans are grown in the United States than anywhere else in the world.

# Background Information for Teacher:

On a soybean seed there is an outer seed coat and every seed contains a tiny plant (embryo) that consists of leaves, stems and root parts. Certain conditions are necessary (such as temperature, moisture, air) to allow the seed to germinate and the plant to grow. The seed also contains a short-term food supply called the endosperm. This is formed at fertilization; however, it is not part of the embryo. Instead, it is used by the embryo to help its growth. The majority of a seed is its fleshy interior called the cotyledon, which stores food for germination.

# LEARNING PROCEDURES

Interest Approach:

1. Review students' existing knowledge of the criteria plants need for growth and repair
2. Ask questions and solicit responses:

**“What resources do plants need to grow and repair? and How do plants use these resources?”**

Air: necessary for photosynthesis in leaves. Water: used in photosynthesis; aids roots in absorbing nutrients from the soil; assists germination; transpiration. Light: photosynthesis Nutrient rich soil: used for energy and building blocks.

**“What is the process of growing a plant from a seed called?”**

Germination: the process of an embryo emerging from its seed

1. Plant soybeans. Mark on calendar. Divide students up into groups of two. Give each group a peat pellet. Instruct students to use a pencil to push in the seed, plant the bean seed about 1/4" deep in each peat pot.
2. Explaining to the students that “A peat pellet is made from sphagnum gathered peat from peat bogs. Lime and a special fertilizer with low ammonium content are added to the peat in order to stimulate growth. Peat pellets are ideal for starting seeds indoors. Just put a few seeds in each pellet and add water. The peat pellets expand into a self-contained soil container held together by degradable netting. The netted container can be sown directly into the ground or planter pot.”
3. Over the next two weeks, have students observe plant parts on a growing soybean plant
4. As the following plant parts begin to develop and emerge, consider the following parts and their functions. Instruct your students to draw a picture and write a small paragraph saying what would happen if a soybean plant was missing the stem and had no leaves.
5. Acknowledge hidden parts of growing soybean plant. Ask the students:

**“Do you think we can see the entire plant?”**

Answer: No

**“If not, what can't be seen?”**

Answer: The roots

**“What are the functions of the roots?”**

Answer: Roots: usually the underground part of a seed plant body that: transports water and minerals, stores sugars produced by the plant and anchors the plant into the ground

**Concept Elaboration and Evaluation**

* Finish the lesson by having students observe their plant one last time and discuss the overall plant parts it has developed.

# Additional Learning Procedures

To help students review and elaborate more about soybeans, complete a [“I used to think… now I think…”](https://drive.google.com/file/d/1h-IaqKcPf8c6YMfNJkbXtXg-azZ9RMoL/view?usp=sharing) chart and share with other students.

To promote new ways for students to further engage agriculture topics try reading the book [“COOLBEAN The Soybean” by: Shawn Conley.](https://www.amazon.com/Coolbean-Soybean-Shawn-Conley/dp/0891186174/ref=sr_1_3?crid=2U7TBC6UOINHH&keywords=soybeans+agriculture+children%27s+book&qid=1692902588&sprefix=soybeans+agriculture+children%27s+book%2Caps%2C151&sr=8-3)

Additional Texts to Include:

[My Family’s Soybean Farm](https://www.agfoundation.org/recommended-pubs/my-familys-soybean-farm)

[Full of Beans](https://www.agfoundation.org/recommended-pubs/full-of-beans-henry-ford-grows-a-car)

[The Super Soybean](https://www.agfoundation.org/recommended-pubs/the-super-soybean)



Source: <http://michigansoybean.org/wp-content/uploads/2015/08/2017-Updated-Teacher-Guide.pdf>

*For more information and additional lessons visit*

*https://msfb.org/ag-in-the-classroom/lesson-plans/.*