



Show Me the Beans - First Grade

Purpose

Students will learn that soybeans are an agricultural commodity grown by North Carolina farmers and it's variety of uses.

Subject Area(s)

Science and Math

Common Core/Essential Standard

Science

- 1.L.1 Understand characteristics of various environments and behaviors of humans that enable plants and animals to survive.

Math

- 1.NBT.A1 Count to 120, starting at any number less than 120. In this range, read and write numerals and represent a number of objects with a written numeral.

Agricultural Literacy Outcomes

Plants and Animals for Food, Fiber & Energy

- Identify examples of feed/food products eaten by animals and people.

Culture, Society, Economy & Geography

- Trace the sources of agricultural products (plant or animal) used daily.
- Identify plants and animals grown or raised locally that are used for food, clothing, shelter, and landscapes.

Essential Questions

1. What do plants need to grow?
2. What are the parts of a seed and what is the function of each part?
3. How are soybeans used?
4. In what types of products can we find soybeans?

Vocabulary

Soybean: a widely cultivated plant of the pea family which produces edible seeds used in a variety of foods and fodder, especially as a replacement for animal protein.



Pod: an elongated seed vessel of a leguminous plant such as the pea, splitting open on both sides when ripe.

Cotyledon: an embryonic leaf in seed-bearing plants, one or more of which are the first leaves to appear from a germinating seed.

Seed Coat: the protective outer coat of a seed.

Embryo: the baby plant, the part of the seed which turns into the leaves, the stem and the roots of the plant

Student Motivator

Show a soybean plant to the class. Call your local Farm Bureau office and ask for names of farmers that could provide you with a few soybean plants before its harvested in the fall. Allow each student to pick a bean pod from the plant. Explain that soybeans are one of the crops grown by farmers in North Carolina. Have a group discussion on how the bean pod feels. Have students open their pod, take out the beans and feel them. *How do the beans feel compared to the pod? How many beans were in the pod?* Most will answer “three” since this is the number of soybeans normally stored in a pod. Take up the beans by having students place them, one at a time, into a zip sealed bag and count as they place their beans in the bag. The first person will count “one, two, three” and the next person will count “four, five, six.” This cumulative count will continue until all students have placed their beans in the bag. Tell students that they will be using the beans in a activity later.

Use the smart board to show a time elapse video of beans growing. Choose from either of these youtube videos:

https://www.youtube.com/watch?v=eu_l80m7K2o Climbing Bean Growing

<https://www.youtube.com/watch?v=pB4ASdELBbQ> Mung Bean Germination

Background Knowledge

Soybeans are one of the most versatile crops grown in the world. Like some other beans, soybeans are used in food products, such as chocolate, breads, cooking oils, and baby foods. But the use for the soybean does not stop there! Soybean oil is used to produce such items as inks, cosmetics, crayons, and disinfectants. Protein from soybeans helps make plastics, antibiotics and livestock feeds.

Soy lecithin is used as an emulsifier. In chocolate products, soy lecithin helps keep chocolate from becoming messy! Farmers in the United States grow more soybeans than farmers in any other country. About half of the soybeans grown in the United States are used here; the other half are exported for use in other countries. Soybeans are grown all over North Carolina. They are good for us and provide good things for our bodies.

In 2014 North Carolina harvested 1.75 million acres of soybeans; making it the highest number of soybeans ever produced in North Carolina. In North Carolina the yield average in 2014 was 40 bushels per acre. Soybeans are mostly used for their oil used for cooking, margarine, salad dressings, mayonnaises, or biodiesel oil. The part of the soybean which is left after the oil is removed is used for various kinds of animal feed.

Materials

- Two lima beans, one soaked for approximately 24 hours in water and one not soaked
- Parts of a Seed worksheet found online at this [site](#):
- Various boxes or packages of products which contain soybeans may include baked breads, crackers, cakes, cookies and pies.
- Two sets (more if needed for each student to have one bag) of zip-sealed bags with a number of soybeans in each bag from 1 to 10. Label each set by placing a colored dot of the same color on each bag in the set. For example, you may have one set with green dots and another with blue dots. This activity can be extended by preparing zip-seal bags with greater amounts of soybeans.
- *From Seed to Plant* written by Gail Gibbons

Procedures

Activity 1

1. Make an anchor chart of a seed. Use the worksheet *Hoosier Homesteader Parts of a Seed* as an example to create an anchor chart.
2. Give each student a post it note and ask them to write down things they know about seeds. Each student can share what they wrote and place their post it on the anchor chart.
3. Using the anchor chart, discuss the parts of a seed and what each part does. The *embryo* is the baby plant which will eventually be the bean plant. The *cotyledon* provides food that feeds the baby plant so it can grow. The *seed coat* protects the baby plant or the embryo.
4. For additional pictures and information of a seed, use the book *From Seed to Plant* written by Gail Gibbons.
5. Pass out 2 lima beans for each student or you can have 2 lima beans for every two students to work in pairs to explore the beans. One lima bean should be soaked in water for at least 24 hours.
6. Have students compare the two beans. Have them break the *seed coat* or *cotyledon* off the soaked bean and explore the parts of the seed.
7. Students will complete the *Hoosier Homesteader Parts of a Seed Worksheet*.

Activity 2

1. Using the Smart Board visit the Illinois Agriculture in the Classroom website and access the Ag Reader on Soybeans at this [site](#). The reader is interactive and provides videos. Look for the blue video recorder seen next to a featured story. Simply click your mouse once directly on the video recorder and the video will begin playing.
2. Using the Ag Reader on Soybeans specifically focus on the first page *Watch it Grow*, and the third page, *Just What Are Soybeans?*
3. Continue reviewing the Ag Reader on Soybeans to discuss production, processing, distribution, biodiesel, and marketing and consumerism on pages four, five, and six.
4. Discuss the different uses of soybeans using the chart on page seven of the Ag Reader.
5. Distribute various packages of food products used in everyday life such items could include baked bread, crackers, cakes, cookies, and pies.
6. Have students work individually or with partners to read the labels and make a note of any kind of soybean product listed in the ingredients of their product.
7. Students should share what they have found with the class.
8. The teacher can assist in making a chart which shows the types of soybean products found in the various products studied by the class.

Activity 3

1. Using the soybeans collected in the Student Motivator activity, prepare two sets of bags with various numbers of soybeans in the bags. Each set of bags should have the same number of soybeans. For example, you could have a set of bags with sets of beans 1-10 and the other set should have sets of beans 1 – 10 as well. So there will be two bags with one bean, two bags with two beans, to bags with three beans, etc. Depending on the readiness of the students, the bags could also have sets of beans from 10 – 19 or 20 – 29, etc..
2. Each set of beans should have a colored dot on them. For example, one set could have green dots and the other set could have blue dots. Give each student one of the previously prepared zip-sealed bags of soybeans.
3. Tell students that it is very important to keep their bags zipped at all times. Each student who keeps his/her bag zipped the entire time will receive a "sweet" surprise.
4. Ask, *What's inside your bag?* Verify that it is soybeans. Tell the students that soybeans are grown in NC. Soybeans are a major export of our country with many uses.
5. Discuss some of the uses with the students.

6. Students will find all of the students who have the same color dot on their bag and will then organize themselves in a straight line from 1 to 10, or from 10 – 19 or from 20 – 29 or from least to greatest if the bags do not have sequential numbers of beans. Allow talking the first time the class does the activity.
7. Throw bags into a box. Give each student a different bag. Repeat Step #6.
8. Throw bags in box again. Redistribute bags. This time have students organize themselves in a straight line, 1-10, using NONVERBAL communication only.
9. Take up bags. As students return to their seats, give each student a snack size bag of M&Ms. Be cognizant of any students who have nut allergies. M&Ms are not safe for students with nut allergies and an alternative sweet snack may need to be provided for students with allergies.
10. Ask students if there is any relationship between the M&Ms and soybeans. Explain use of soy lecithin. Use this [site](#) as a resource for the uses of soy lecithin:

Suggested Companion Resources

- NC Department of Agriculture and Consumer Resources, AG's Cool Soy Beans
<http://www.ncagr.gov/agscool/commodities/soykid.htm>
- North Carolina Soybean Producers Association, Inc.
www.ncsoy.org
- North Carolina Department of Agriculture and Consumer Statistics
<http://www.ncagr.gov/stats/release/CropRelease01.pdf>

Essential Files

- Hoosier Homesteader Parts of a Seed Worksheet
<http://www.hoosierhomesteader.com/2013/04/garden-math-and-science.html>

Essential Links

- Science Kids – How Plants Grow Game
<http://www.sciencekids.co.nz/gamesactivities/plantsgrow.html>
- YouTube
<https://www.youtube.com/watch?v=jm12JKhNnWY>
<https://www.youtube.com/watch?v=pB4ASdELBbQ>
https://www.youtube.com/watch?v=eu_l80m7K2o
- Illinois Agriculture in the Classroom Ag Mag on Soybeans
<http://www.agintheclassroom.org/TeacherResources/AgMags/Soybean%20Ag%20Mag%20for%20Smartboard.pdf>
- What is Soy Lecithin and Why is it Found in So Many Products?

<http://blog.fooducate.com/2009/07/07/what-is-soy-lecithin-and-why-is-it-found-in-so-many-products/>

Ag Facts

- Soybeans represent 45% of the total production of US crops which are exported. 1.79 billion bushels of soybeans were exported from the US in 2014.
- The US led the world in soybean exports. Brazil was second in soybean exports. Brazil exported 1.69 bushels of soybeans in 2014.
- In 2014 soybeans represented 59% of oilseed production in the world.
- The US soybean crop was valued at nearly \$40.3 billion in 2014.
- In 2014 North Carolina harvested 1.75 million acres of soybeans.
- In North Carolina the yield average in 2014 was 40 bushels per acre.

Extension Activities

- Students can play a game online which balances the amount of heat and water required to make a plant grow. <http://www.sciencekids.co.nz/gamesactivities/plantsgrow.html>
- Students can listen to a story on YouTube, *Sid the Seed*, written by Daniel R. Pagen, found [here](#).
- Students can explore soybeans through history using the timeline on pages eight and nine of the Ag Mag on Soybeans found on the Illinois Agriculture in the Classroom website [here](#):
- Students can make a Beanie Baby. Instructions are on page eleven of the Ag Mag on Soybeans found on the Illinois Agriculture in the Classroom website [here](#):
- Read the book, *From Seed to Plant* written by Gail Gibbons while stopping to discuss the different parts of the seed and the plant.

Sources & Credits

- <http://www.ncagr.gov/agscool/commodities/soykid.htm>
- <http://www.hoosierhomesteader.com/2013/04/garden-math-and-science.html>
- <http://www.sciencekids.co.nz/gamesactivities/plantsgrow.html>
- <https://www.youtube.com/watch?v=jm12JKhNnWY>
- <https://www.youtube.com/watch?v=pB4ASdELBbQ>
- https://www.youtube.com/watch?v=eu_180m7K2o
- <http://www.agintheclassroom.org/TeacherResources/AgMags/Soybean%20Ag%20Mag%20for%20Smartboard.pdf>

- <http://blog.fooducate.com/2009/07/07/what-is-soy-lecithin-and-why-is-it-found-in-so-many-products/>
- <http://soystats.com/2013-highlights/>
- <http://www.ncagr.gov/stats/release/CropRelease01.pdf>
- www.ncsoy.org