



KIDS CONNECTION

Super Soybeans

Soybeans are small round or oval seeds that are a rich source of protein and oil. The bushy green soybean plant is classified as a legume. It can take nitrogen from the air and transform it into nitrogen in the soil that plants can use as a nutrient. It does this through unique root nodules that contain rhizobium bacteria that take the nitrogen gas from the air and transform it to usable nitrogen for the plant.

Kansas usually ranks 10th or 11th in soybean production. Animals are the number one consumers of Kansas soybeans in the form of soybean meal. Soybean oil and meal are found in many processed food products we buy at the grocery store. If you read the food label it may be listed as soy oil, soy lecithin, soy protein, tempeh, miso, soy nuts, tofu, edamame or textured vegetable protein (TVP).

SOYBEAN GROWTH CYCLE



1. Germination: A new plant germinates or begins when the seed coat is softened with proper moisture (50% of the seed weight) and the temperature is warm enough. The primary root called the radicle begins to emerge from the seed into the soil.

2. Emergence: The cotyledons are pulled up through the soil by the hypocotyl stem or "hook" as it lengthens. Once out of the soil, the stem straightens and you can see the first true leaves or cotyledons at the top of the stem.

3. Vegetation: Leaves develop along the stem. The point of attachment is called a node. Soybeans have numerous nodes and leaves that are in sets of three.

4. Reproduction: Flowers bloom and pollination occurs. This allows fertilization to take place. The pods begin to develop and seeds form within the pod.

5. Maturity: The plant reaches maturity once all the pods are filled with fully developed seeds. The plant then turns brown and dies. The plant is ready to be harvested!

Soybeans are everywhere!

Soybeans can be found in many products that we use on a daily basis! Which items do you use every day?



paint



protein bars



cooking & salad oils



pet food



tofu



cake



candles



chocolate



carpet backing



lotion



edamame



fish feed



furniture



biofuels



animal feed

Nutritious Soybeans!

Soybeans are very high in protein. They contain ample amounts of dietary fiber, vitamins, minerals and plant sterols and are a good source of unsaturated fat.

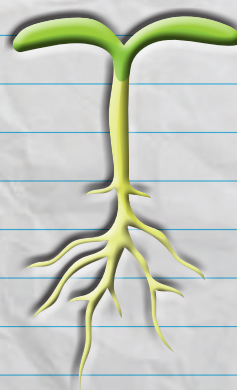
MAKE YOUR OWN SOYBEAN GERMINATION NECKLACE

Materials:

- Jewelry-sized resealable plastic bags
- Crystal soil water holding polymer
- Hole punch
- Water
- Measuring spoons
- Eye dropper
- Soybean seeds
- Yarn

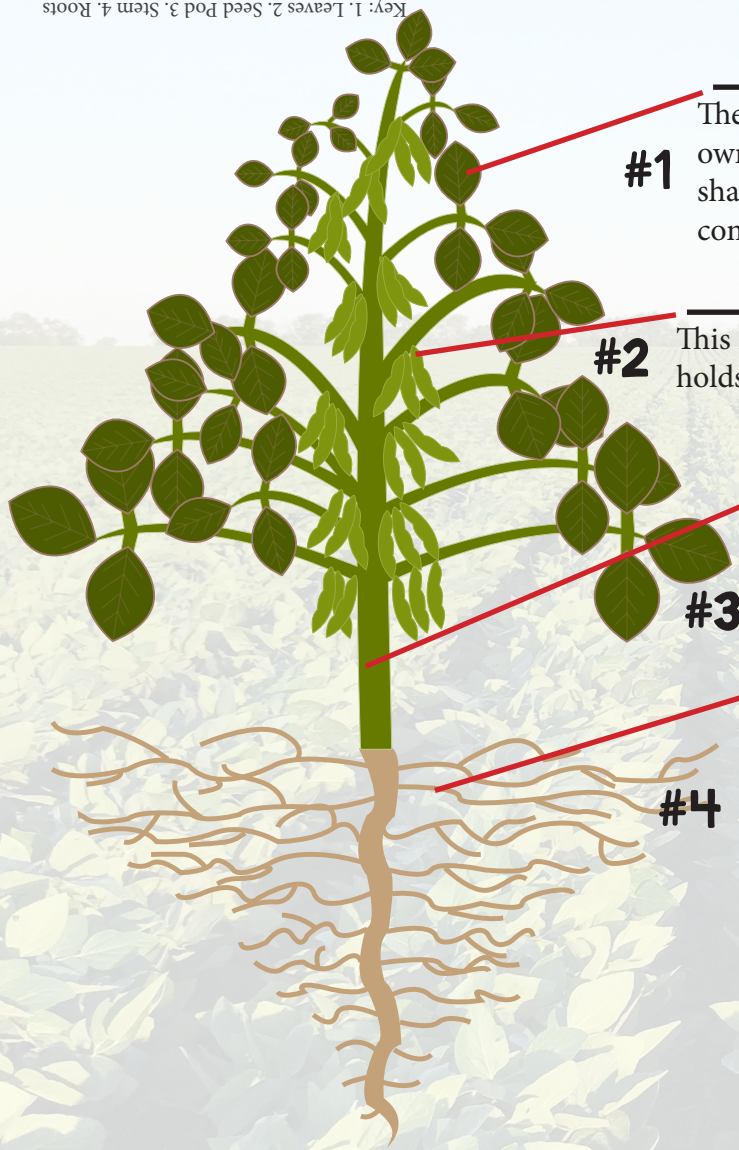
Directions:

1. Punch a hole in the top of a small plastic bag, above the seal.
2. Place 1/4 teaspoon of polymer into the bag.
3. Add one tablespoon or two droppers full of water.
4. Gently push in two soybean seeds.
5. Seal the bag firmly.
6. Insert the yarn to make a necklace
7. Wear the Beanie Baby around your neck and under your shirt to keep the seeds in a warm, dark place.
8. Check your Beanie Baby each day for germination and record the growth.
9. If you desire, transplant the sprout to a soil-filled cup and continue to watch the growth.



Label it: Soybean Plant and Seed

Modern soybean varieties generally reach a height of 3.3 feet and take 80-100 days to grow from planting to harvest. Soybeans in Kansas are generally planted in May and harvested in October. Some Kansas farmers plant soybeans after wheat harvest in June and harvest in October or November.



#1

These are found in sets of three. They help the plant produce its own food through photosynthesis. These are bushy and help shade the ground which ensures there is little weed growth to compete with the soybean plants.

#2

This is a structure that holds the seeds or fruit. Each one typically holds 3-4 seeds.

#3

This provides support for the plant. It absorbs and transports water and nutrients to the plant. Smaller ones develop along the main one and support sets of three leaves.

#4

These hold the plant in place and absorb water and nutrients. Rhizobium bacteria live on this system in nodules that look like bumps. This makes the plant a legume. These bacteria convert the nitrogen from the air to a form the plant can use as a nutrient.

WORD BANK

Roots
Stem

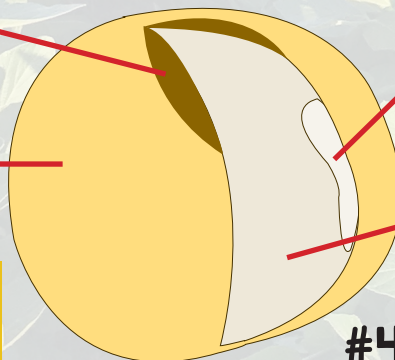
Leaves
Seed Pod

The brown spot on the seed that shows where the seed was attached to the pod.

#1

The outside hard cover that protects the seed.

#2



#3

The part of a seed that develops into a new plant, through germination, including the stem, leaves and roots.

#4

This is the part of the seed that stores food that will be used until the plant develops its leaves and stems above ground. Since it has a pair of first leaves the soybean plant is known as a dicot.

WORD BANK
Cotyledon Seed Coat
Embryo Hilum

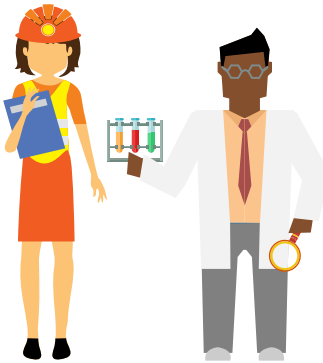
Did you know? Kansas Soybean Facts

1. In 1930, only 7000 acres were harvested, producing 52,000 bushels. In 2017, over five million acres were harvested, producing over 190 million bushels.
2. Six every ten rows of soybeans harvested are exported to other countries.
3. Kansas has 15,000 soybean farms.
4. The 2017 Kansas soybean crop was worth \$1.7 billion, which was 26 percent of the state's total principal-crops value.
5. In 2017, Kansas ranks tenth in soybean production in the U.S.

Want to learn more about how soybeans are produced? Watch this video about soybean farming at bit.ly/soybeanfarm



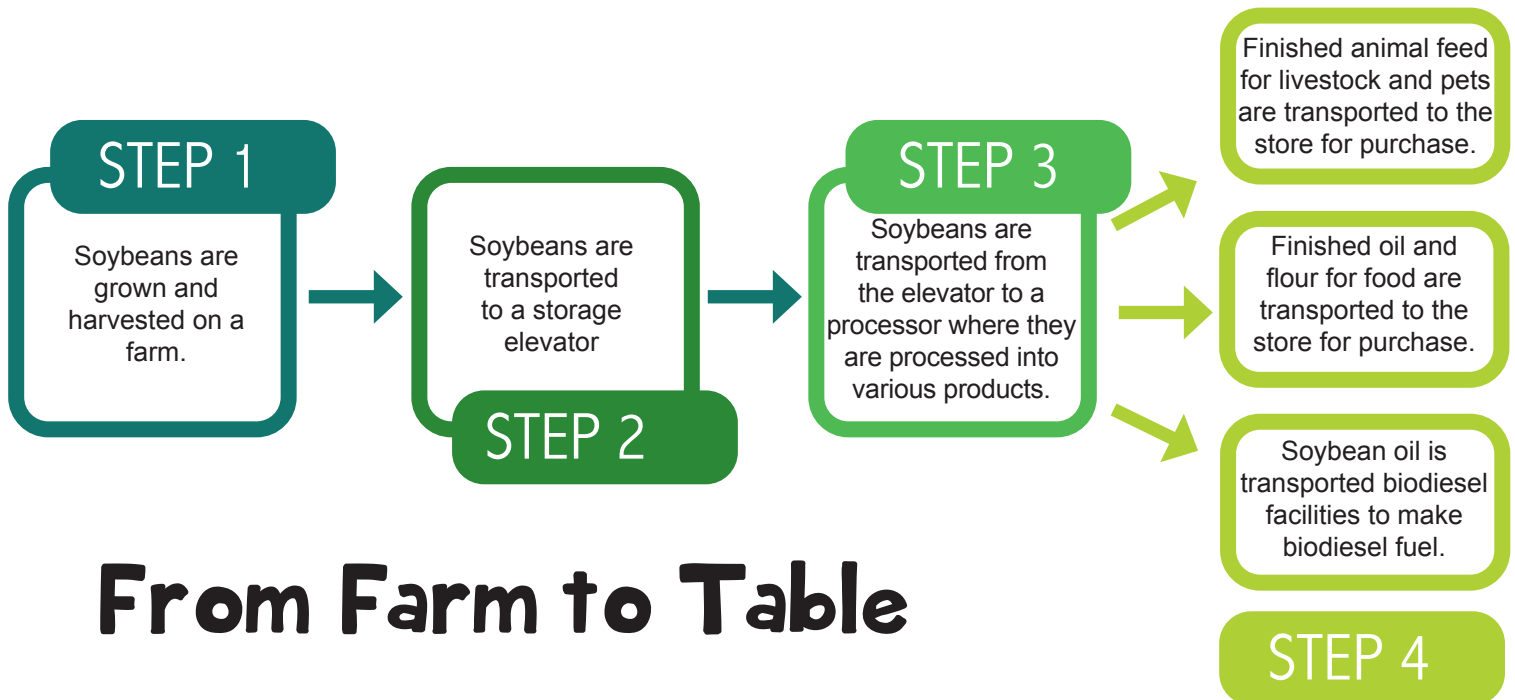
CAREER CORNER: Careers in Soybeans



Food Scientist: Creates food products such as salad dressing using soy oil as the main ingredient.

Livestock Nutritionist: Helps develop diets for animals that meets their basic nutritional needs.

Environmental Engineer: Works on the farm and in food production facilities to put systems into place that protect water, soil and air.



Kansas Foundation
for **AGRICULTURE**
IN THE CLASSROOM

Learn more about Kansas
agriculture at
www.ksagclassroom.org.

