



## At Home Science! All about Beans

This science experiment can be done using simple household items. Students will have the chance to dissect a bean, and track the life cycle of a plant.

### What You'll Need:

- Dried beans of any kind(We used kidney beans)
- A butter knife or scissors
- A plastic bag or clear container
- Paper towel, cotton ball, or soil
- Water

### How to Start:

Soak a few of the dried beans in water for 12 hours. While those beans are soaking, start your planting experiment with the leftover dried beans.

### Tracking the Plant Life Cycle

1. Dampen your paper towel or cotton ball with water. If using soil, use a spoon to scoop enough into the bag to form a layer on the bottom.
2. Place your bean on the paper towel or cotton ball, and carefully place it in the bottom of a plastic bag or clear container of your choice.



3. Tape it to a sunny window to watch grow.



4. As your bean grows, chart its life cycle as you notice roots, stem, and leaves develop!



(look for signs of respiration from your bean! Fog like dew droplets will appear)

5. Once your bean sprout is big enough, transplant it into soil and see if it can grow more beans.

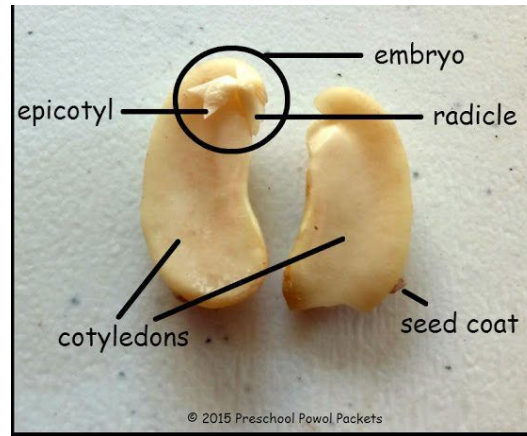
*(Did you know: Beans are actually seeds! See if your bean plant will produce new seeds. Can you think of other seeds you eat? )*

#### Bean Dissection

1. Place your softened beans on a safe surface for the dissection.
2. Using your scissors or knife, carefully cut the bean in half lengthwise and split open.



3. Find the embryo where the new seed will grow. Find the seed coat which protects the seeds. And find the food store (cotyledons) which the plant will use for energy to grow.



## Diving Deeper:

### Basic Needs of Plants

What do plants need to survive? Experiment with placing your bean in different windows and see if it changes the beans ability to grow. Do you think your bean would grow in a closet? What about in the shower? Test it out and see! Examine what the bean needed to grow the most successfully. Based on your observations, what region of Georgia do you think is best suited to growing beans in a garden?

### Battle of the Beans

Repeat the experiment again with other types of beans. Try with lentils, black beans, peas, chickpeas! Was there a bean that grew the fastest? Slowest?

### Properties of Matter

Test how the shape and weight of beans affects their buoyancy by dropping the bean in a clear glass full of water to see if it will sink or float. Experiment with viscosity of liquids. Use thicker liquids like canola oil or soap. How does the bean react when dropped in those substances?

## **Additional Resources**

[What's Inside a Bean?!](#)

[Bean Time Lapse](#)

[Do Plants Have Intelligence?](#)

[Spill the Beans Math Game](#)

[The Cool Bean Read Aloud](#)

[Dancing Beans and Rice](#)

### **Standards Covered in this Lesson:**

**SKP1.** Obtain, evaluate, and communicate information to describe objects in terms of the materials they are made of and their physical attributes

c. Plan and carry out an investigation to predict and observe whether objects, based on their physical attributes, will sink or float.

**SKL1.** Obtain, evaluate, and communicate information about how organisms (alive and not alive) and non-living objects are grouped.

a. Construct an explanation based on observations to recognize the differences between organisms and nonliving objects.

b. Develop a model to represent how a set of organisms and nonliving objects are sorted into groups based on their attributes.

**S1L1.** Obtain, evaluate, and communicate information about the basic needs of plants and animals.

a. Develop models to identify the parts of a plant—root, stem, leaf, and flower.

b. Ask questions to compare and contrast the basic needs of plants (air, water, light, and nutrients) and animals (air, water, food, and shelter).

c. Design a solution to ensure that a plant or animal has all of its needs met.

**S2L1.** Obtain, evaluate, and communicate information about the life cycles of different living organisms

b. Plan and carry out an investigation of the life cycle of a plant by growing a plant from a seed and by recording changes over a period of time.

d. Develop models to illustrate the unique and diverse life cycles of organisms other than humans.

**S3L1.** Obtain, evaluate, and communicate information about the similarities and differences between plants, animals, and habitats found within geographic regions (Blue Ridge Mountains, Piedmont, Coastal Plains, Valley and Ridge, and Appalachian Plateau) of Georgia.

c. Use evidence to construct an explanation of why some organisms can thrive in one habitat and not in another.

**S4L1.** Obtain, evaluate, and communicate information about the roles of organisms and the flow of energy within an ecosystem.

c. Design a scenario to demonstrate the effect of a change on an ecosystem. (Clarification statement: Include living and nonliving factors in the scenario)

**S5L1.** Obtain, evaluate, and communicate information to group organisms using scientific classification procedures.

b. Develop a model that illustrates how plants are sorted into groups (seed producers, non-seed producers) using data from multiple sources.

**SBO5.** Obtain, evaluate, and communicate information to analyze the diversity of plant adaptations and responses to changing environmental conditions.

b. Construct an argument based on evidence to predict which plant adaptations increase survival in different stressful environments (i.e., water extremes, saline environment, and extreme temperature).

