

Age Level: 1<sup>st</sup> Grade

Suggested Time: 60 minutes

Location: Outdoors near the garden beds that will be used for planting

## Understanding Plant Growth

### OVERVIEW

We will explore the concept of germination - how seeds grow into plants.

In this lesson we will discover what seeds need to germinate, create visuals for understanding how germination works, dissect a large bean, and plant our very own sugar snap peas.

### CLASSROOM PREP

Prior to this lesson, read California Science Chapter 1 (Plants and Their Needs) to introduce background information and vocabulary

### MATERIALS

- Fava or lima (or other large bean) for a seed dissection, purchase these fresh -one per student
- Dried sugar snap pea seeds for planting
- Book: [A Seed is Sleepy](#) (or another book involving a seed)
- Dried plant "props" to supplement book such as dried sunflower head, artichoke flower, or "hitch hiking" seeds such as Mexican Feather grass
- Sprouting bean sequence cards (one set per student) copied and cut out– see Enchanted Learning website:  
<http://www.enchantedlearning.com/subjects/plants/sequencing/sproutingbean/index.shtml>
- Crayons or colored pencils
- Colored construction paper cut so all 4 bean sequence cards can be glued in order on the colored paper
- Glue sticks
- Seeds for "glass jar" demo (large seeds like beans work well)
- Glass jar with moist paper towels in it

### INTRODUCTION

Most plants come from a seed. A seed is dormant until it feels a 1<sup>st</sup> grader take it out of the packet and plant it in the soil. It feels the water and the sun, the seed coat pops off, its root goes down and a sprout pokes its head out of the soil. Then the first leaves grow. This process is called germination.

Ask each group to step inside a dormant seed. What might this quiet seed observe or notice? How would this seed act when it is ready to germinate? Let's act this process out together. Everyone stand and curl yourself into a ball like a little seed. Put on your invisible seed coat....(recite the planting and germination steps again as the students act them out)

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Now let's draw this process on the white board (copy from one of the bean sequence cards.) What happens first? *Seed is planted in the dirt.* What happens next? *It feels water and sun and pops off its seed coat.* Then what happens? *A root goes down and a sprout goes up.* And last? *The first leaves grow.*

### **STUDENT INSTRUCTIONS (spoken directly to students)**

As seed investigators, let's see if we can look closely at a real seed and find the parts of the plant we just acted out. (*Hand out one fava bean seed to each student*). Using your fingers, carefully dissect or open the seed pod to reveal the seeds inside. How is the inside of the seed pod different from the outside? How is the seed attached to the pod? Can you see the seed coat? Can you remove it? Which part of the seed do you think the root and sprout will come from? (*Collect the dissected pods/seeds*)

We have 3 activities to accomplish today – planting pea seeds, explore seed books with partners, and making your own seed germination sequence cards. We are going to break the class into 3 groups and each group will rotate to each of the 3 activities.

#### 1. Planting Peas

- a. Let's take our trowels and turn the soil to make room for our seeds
- b. Why do we turn the soil? What makes healthy soil (nutrients, air pockets, etc.)? How does our soil look, feel and smell?
- c. Let's plant our peas down the center of the bed (this is so another class can plant around the outer edges of the garden bed)

#### 2. Shared Reading

- a. With a partner, choose a book about seeds from the basket and describe to each other what you see.
- b. In your book, can you find the parts of the seed we acted out and dissected?
- c. Are there pictures or words in your book that you don't know?
- d. Using sticky notes, mark the pages with items that you have questions about.

#### 3. Sprouting Bean Sequence Cards

- a. You will each have four cards that show the process of germination, or how a seed becomes a plant.
- b. Put your cards in order from what happens first, to what happens last.
- c. When you have the correct order, glue your cards to a piece of construction paper.
- d. Write the words "first", "next", "then", and "last" under each picture to show the order in which things happen. Write your name on your card too.

### **WRAP UP**

- Share student thinking by asking them to review the steps in germination.

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- Since our seeds will start by doing the important work of sprouting under the dirt, we will not be able to see them! Ask the students if they will see their pea seeds sprouting if they walk by the garden tomorrow? No! The seeds are working under the soil. It could take 10 days to see a sprout.
- We are going to put a few seeds in a glass jar and you may take them back to class. These seeds will have water and sun and they will be "tricked" into thinking it is time to sprout. We do this so we can see them germinate and put their roots down. *(Put a few bean seeds in the prepared jar with the wet paper towels. Make sure that the seeds are pressed up against the glass so the students can see them. Ask the teacher to put the jar in a sunny window and keep the paper towel moist.)*
- Tell the students that when we meet as a class next, we will learn about an important plant superpower...turning sunlight into food.

### CLASSROOM EXTENSIONS

- Have the students predict how many days it will take for the seeds in the glass jar to germinate. Have them do the same for the pea seeds in the garden. Observe the seeds daily and communicate the results. What do the results make them wonder?
- As the classroom seeds germinate, draw pictures to show the roots and sprouts.
- Based on what they think they know about peas, have them draw pictures of what their garden plants might eventually look like. Capture all these thoughts, observations, and predictions in a Garden Discovery Journal.

