

## STEAM Subject: Ecology Lab: Germinating Seeds

Grades: 2nd-5th

### Learning objective:

Students will learn the plant life cycle and what it needs to survive. Students will use a simple model to create a greenhouse and grow their own plant.

### ENGAGE:

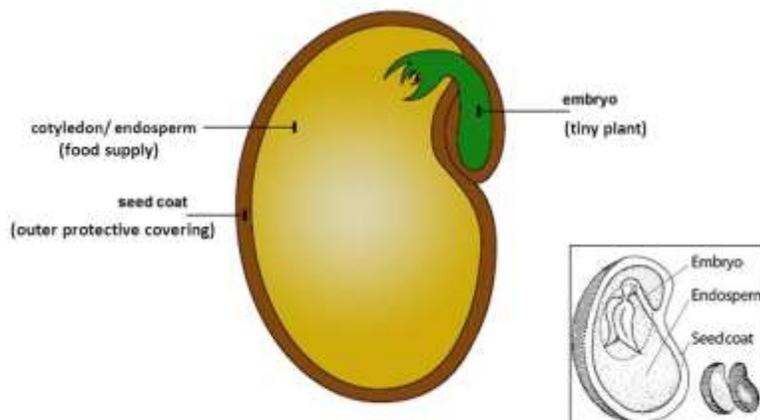
#### Ask students the following questions:

- What do plants need to survive? Plants need water, sunlight, carbon dioxide and nutrients/soil to survive.
- Name the parts of a plant. Roots, stems, leaves, flowers, fruits
- What is the basic plant lifecycle? Most plants follow the basic plant life cycle: seed is planted > sprouts roots > grows stem > grows leaf > flower blooms > produces fruit > flower/fruit releases seed.

### EXPLORE:

*Intro to parts of seed:*

## Three Main Parts of a Seed



**Mini Greenhouse Activity:**

Students will participate in an interactive activity where they observe a seed germinating into a plant.

**Materials needed per student:**

- 1 Zip-lock bag (snack, sandwich, or quart size)
- 1 paper towel (a handful of cotton balls works as well)
- Raw/dry beans or seeds
- Water (preferably in a spray bottle)
- Ruler
- Tape to secure bag to window if needed
- Small pot/planter with soil, or outside garden

**Directions:** Each student will dampen a paper towel (or cotton balls) with water. The towel should be moist, however not dripping water. Place paper towel in the Zip-lock bag along with at least one bean/seed on one side of the towel. Seal bag and place in a window, either taped to the window or just placed in the sill. Have students monitor growth each day.



**Additional Resources:** Watch videos about plants growing.

- **Explanation:**
  - <https://youtu.be/tkFPyue5X3Qo>Time-lapse
  - <https://youtu.be/ECibetK2EYI>

**Discussion:** Over time, we can see the bean/seed begin to sprout! This usually takes a few days. Students should record observations each day. Is the bean/seed beginning to swell? Has it sprouted? Can you identify the seed coat? Have roots started to grow? Do you see any leaves? After a week or two, the bean/seed should be big enough to transfer to soil. Students may notice condensation forming in the bag. This can lead into a discussion of the water cycle.

**Optional Activity:** Dissect a bean. Soak a bean in cold water overnight. Rub the bean in between fingers to remove seed coat. Pull the two halves open with fingers or tweezers and try to identify the parts of the seed.

### EXPLAIN:

- **Review vocabulary of the parts of a seed and plant**
  - **Flower:** the bloom/blossom of a plant that holds the seeds, reproductive organ for most flowering plants/angiosperms
  - **Germination:** when a seed begins to develop, this occurs after the seed is watered
  - **Roots:** one of the first structures to grow, they grow downward and hold the plant into the ground
  - **Seed:** the small part of a flowering plant that grows into a new plant, fertilized part containing embryo
  - **Sprout:** the beginning growth of a plant
  - **Leaves:** the main organs of photosynthesis and transpiration in plants
  - **Stem/Stalk:** a slender or elongated structure that supports a plant
  - **Seed coat:** the protective covering that surrounds the seed
  - **Embryo:** baby plant
  - **Endosperm/Cotyledon:** the material that feeds the baby plant

### EVALUATE:

Have students think of the plants they see around them. What types of plants do we have in San Diego? Can you find seeds on a walk through your neighborhood? Plant your own garden and explore more about plants!

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