

Sprouting Seeds Without Soil

Area: Physical Science

Age Group: 1st – 3rd Grade

I. Materials:

- Staples
- Paper towels
- Diluted bleach
- string
- Large clips or safety pins
- sharpies or permanent markers

Each student will also need:

- A plastic sandwich bags (with seals)
- 4-6 bean or pea seeds

II. Objective

This activity shows how a seed germinates and begins to grow. Students will be able to observe the roots sprouting from the top of seed and growing downward and the stems, sprouting from below and growing upward.

III. Procedure:

Teacher Preparation - Preparing the Seeds :

1. To help prevent mold in the germination bags, dip the bean and pea seeds in a solution of diluted bleach (**one** tablespoon of chlorine bleach to **one** quart of water)
2. Put the seeds in a strainer and dip them in the diluted bleach for 15 seconds
3. Without rinsing, place the seeds in the germination bags (plastic sandwich bags that seal).

Student Activity – Assembling the Germination Bags

1. After obtaining all materials, remind the students to put their names and the date on the plastic bags.
2. Place the paper towel in the clear bag, folding as necessary so that it will lay flat.
3. Create a row of staples across the plastic bag, approximately 1 inch from the bottom of the bag. See below figure.
4. Position the seeds above the staples. Use approximately 4-6 seeds per student.
5. Add 3 tablespoons of water to the bag.
6. Close the bag and hang it so that the bag is vertical and the seeds lie nicely on the staples. This is best done with some string and clips or by pinning the bags to a board. Note: It is better not to hang these in direct sunlight.
7. As the seeds germinate, observe and record seed growth each day on the “Seed Growth Chart” on the next page.

Student Activity – Daily Observation

1. Students should observe the growth of their seeds on a daily basis. Drawings of their observations should be recorded in the Seed Growth Chart.

2. All other observations should be recorded on page 2 of the Seed Growth Chart.
3. Students should pay particular attention to:
 - a. Direction of growth
 - b. Physical characteristics of the seed/sprout (e.g. color, texture, odd growths, etc)
 - c. Environmental conditions (e.g. how much water is in the seed; what was the weather like on the previous day; etc)
4. Students can compare their observations and drawings with other students. Point out differences between the student's drawings. Encourage the students to think about the reasons behind these differences. This will stimulate scientific thinking.
5. Students should use their observations to gain a greater understanding of the progression of a seed to a plant and should try to draw conclusions/generalizations about the conditions under which seeds grow the best.

IV. Supplementary Questions:

1. How did the seeds grow without any soil?
2. What does a seed need to grow?
3. If some of the seeds did not successfully grow, what factors could have contributed to their failure to sprout?
4. What role does the root play in terms of the growth of a plant? (absorbing nutrients from the soil)
5. What role do the leaves play in terms of the growth of the plant? (absorbing sunlight)
6. What process allows the plants to obtain their "food" from the sun? (Photosynthesis)

Seed Growth Chart

Name:

Date:

Date:

Date:

Date:

Date:

Date:

Seed Growth Chart – Observations

Name:

Day	Date	Height	Observations
Day 1			
Day 2			
Day 3			
Day 4			
Day 5			
Day 6			