

Seed Germination

Subject Area: Science

Unit Title: Plants

Grade Level: 4th & 5th grade

Objectives: Each student will demonstrate their knowledge of the process of germination without soil.

Colorado Content Standards to be covered:

SCIENCE

Standard I - Students understand the processes of scientific investigation and design, conduct, communicate about, and evaluate such investigations.

Standard III - Life Science: Students know and understand the characteristics and structure of living things, the processes of life, and how living things interact with each other and their environment.

Materials:

- Ziploc plastic bags
- paper towels
- lima beans (beans)
- bleach
- masking tape
- markers
- pencils
- a cup
- stapler
- writing paper
- water
- sticky notes (or scraps of paper)

What it is:	What it isn't:
Vocabulary Word:	
Hydroponic	
Example:	Draw a Picture or Write a Sentence:

Anticipatory Set: Ask your students the question, “What do plants need to germinate and grow?” The correct answers should be: water, soil and sunlight. Then ask the students to write “True” or “False” on a sticky note in response to this statement: It is possible to grow a plant without soil. Have them predict whether an experiment of planting a seed without soil will be successful.

Input: Create and model filling out a Vocabulary Map (see left) have every

student fold the paper in half and then half again. They should open the paper and write in the middle the word “hydroponic.” In the upper left corner they should write the definition or “what it is.” (The definition is: growing plants without soil.) In the upper right corner have students write “what it isn’t.” In the bottom left corner they should write an example such as tomatoes or lettuce. and in the lower right have students draw a picture or use the word in a sentence.

Explain that in Colorado some tomatoes and lettuce are grown without soil in greenhouses. The water solution they grow in provides the nutrients that the soil normally provides.

Checking for Understanding: At the end of this section choose one of the following for a quick check: ask the students to partner share and think, pair and share, do a quick 3 word write up as an exit slip, do a quick sketch or give each other a quick thumbs up or down to check for understanding. Determine the level of mastery for each student and provide individual remediation as needed.

Procedures/Activities:

Hydroponic Seed Germination

Prep:

To prevent mold, dip the seeds in a diluted bleach solution for 15 seconds (1 tablespoon bleach to 1 quart of water). Do not rinse seeds before putting them in the bags.

Directions:

Model the following and have students follow along:

1. Give each student a Ziploc plastic bag with their name written on the masking tape.
2. Give one sheet of paper towel to each student. Fold the paper towel so it fits inside the ziploc bag.
3. Staple across the bag and through the paper towels about 1 inch from the bottom of the bag.
3. Give each student five lima beans. Position the beans spread out above the staples.
4. Add 3 tablespoons of water to the bag, soaking the paper towel.
5. Close the bag and hang from a desk making sure the bag isn’t in direct sunlight.
6. As the seeds sprout, students draw a picture of the seed growth each day.

Do not plant the seeds when done, throw away the bag with seeds in it. This is because of the use of bleach.

Closure:

Brainstorm questions such as: Where did the plant get its nutrients? What supported the plant as it grew? Review and clarify the key points of the lesson including the new vocabulary word. In conclusion, each student should write a paragraph explaining what they observed. Have the students measure daily growth, record and draw a picture that shows what happened in the experiment. If you have covered it previously with your class, review their knowledge about seeds, such as seed coat, food storage and embryo.