

ADOPT – A - SEED

BENCHMARKS AND TASKS

SC.A.1.1.1 The student knows that objects can be described, classified, and compared by their composition (e.g., wood or metal) and their physical properties (e.g., color, size, and shape).

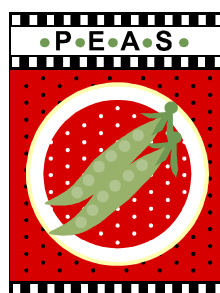
SC.B.2.1.1 The student recognizes systems of matter and energy.

SC.F.1.1.1 The student knows the basic needs of all living things.

SC.F.1.1.3 The student describes how organisms change as they grow and mature.

SC.F.1.1.5 The student compares and describes the structural characteristics of plants and animals.

- The student observes and describes seeds.
- The student maintains certain conditions in order for seeds to progress through stages of growth (seed, seedling, mature plant) and analyzes how nature does the same.



KEY QUESTION

How do plants grow?

BACKGROUND INFORMATION

Nearly all trees, shrubs, and vegetables started as seeds. A seed is actually a container or case, which contains plant life. Seeds have three main parts in common: the seed coat, a tough outer covering; the embryo, a “baby” plant inside the seed; and the cotyledon, the food supply surrounding the embryo. The food supply is the seed’s only source of nourishment as it pushes up through the soil and begins to grow into a young plant. Plants need light for growth, but seeds do not. Seeds are planted underground where it is dark, and they use their own stored energy for growth.

When a plant is just beginning to peek out from the seed, it is said to be sprouting. Once a seed begins to sprout, it needs the right amount of water and a suitable temperature. Water causes the seed to expand. Germination is the process through which the embryo inside the seed begins to grow. As a seed germinates, it develops roots that grow downward, a stem that pushes up to the light, and leaves.

MATERIALS

Teacher

packets of seeds (vegetables, flowers, herbs)

bag of assorted seeds

chart paper

Related literature:

The Tiny Seed by Eric Carle

The Garden in the City by Gerda Muller

Growing a Plant (Benchmark Education Co.)

The Garden from Frog and Toad Together

Per Student

1 milk carton

soil

magnifier

clear tape

student science journals

centimeter ruler

crayons

plastic or styrofoam shallow tray

1 piece of drawing paper

TEACHING TIPS

1. This learning event requires patience and persistence. Note those students experiencing particular success or difficulty in these tasks.
2. Clean milk cartons and poke three holes in the bottom of each using a pencil prior to beginning this activity.

ENGAGE

1. Pass assorted seeds around the room to each table.
2. Ask:
Do you think that these seeds are alive? Why or why not?
How could we find out if they are alive?
If they are alive, or could be, what do you think would make them start to grow?
3. As a class, brainstorm a list of the things students think seeds need to sprout. List these on a class chart.

EXPLORE

Preparing the plants:

1. Place assorted packets of seeds at each table.
2. Explain to students that they will be “adopting” seeds from one of the packets. Ask students to pick one packet of seeds.
3. On a chart, record each student’s selection.
4. Give each student a magnifier, a tray, crayons, and a piece of drawing paper.
5. On the drawing paper, have each student write his/her name; the name of the seed found on the seed packet; create a drawing of the seed from observing it; and a drawing of the plant on the front of the seed packet, which the seed will become.
6. Each student will take a prepared, clean milk carton; fill it 2/3 full of soil; place three holes in the soil with a pencil (about 1” deep); and plant three seeds in the soil.
7. Students will label their seed container with their name and the name of the plant. On one side they will tape the seed packet to the carton.
8. Read to the class either *The Tiny Seed* by Eric Carle or excerpts from *The Garden In the City* by Gerda Muller.
9. Ask:
What things do seeds need in order to grow?
How can we provide for our seeds?
Do you think seeds need to be moist or dry in order to sprout?
What have you observed that makes you believe this?

Plants Sprouting

1. Allow students to place their seeds in a location they choose; water their plants as they feel necessary; and record all observations in student science journals.
2. Read the story called “The Garden” in *Frog and Toad Together*. After reading the story, discuss some of Toad’s ideas about how to “wake up” seeds.
3. Ask:
Do you think yelling might wake seeds up?
How will we decide when seeds have sprouted?
As seeds begin to sprout, record in student science journals how many days it took.

Plants Growing

1. Students will water plants daily and record all observations about the plants (shape, height, number of leaves, color) in their science journals.
2. Have students compare their observations with those of others. How do different plants appear similar and different?

EXPLAIN

Through questioning and discussion, develop the concept of what plants need for growth.

Did your seeds grow?

How did you take care of them?

Did you water them often? How often?

Did all of the seeds grow at the same rate?

Where did you place your seeds in the classroom? Why did you select that spot?

What can you tell us about growing plants?

Can you explain why you think some plants are taller than others?

Why are some plants not as green as others?

Why have some plants not grown very much?

Would you do anything differently if you were to adopt another seed?

EXTEND/APPLY

1. Take the class on a nature walk of the school grounds. Ask them to observe the conditions of various plants. Discuss some possible reasons why some plants are thriving and others are not.
2. Determine if the direction seeds are planted (vertically, horizontally, diagonally) affects the direction the stem of the sprouts will grow. Place seeds on a moist paper towel in a plastic zip lock bag with each seed placed in a different direction. Observe any differences.
3. Watch seedlings as their roots grow by placing them in a “pillow pack” garden. This consists of a gallon-size zip lock freezer bag filled $\frac{3}{4}$ of the way with soil and zipped shut. Set the bag on its side and punch three or four holes on both sides of the bag. Plant seeds, or seedlings, in the holes of one side and place the other side in a large styrofoam meat tray in which you will add water. As the seed sprouts and becomes a seedling, the clear bag will provide the student with an inexpensive viewing site for the growing root system.
4. Read *Growing a Plant*.

EXTENSIONS

1. Invite a person who works with plants to talk with your class (e.g., horticulturalist, nursery person, landscaper).
2. Do all plants grow from seeds? Are there other ways to grow plants? Read *The Plant Sitter* by Gene Zion and discuss. Create plant cuttings, grow bulbs, grow potatoes using the eyes of potatoes to support further learning.

ASSESSMENT

Teacher assessment through observation should include the following criteria:

- Tasks have been completed by the student.
- Student journal entries should show growth and understanding.
- Student demonstrates understanding through successful completion of the activities and in class discussions.
- Data collection and organization of data was effective.
- Use of science tools enhanced their learning.
- Science safety rules were observed.