

Parts of a Plant

Standards of Learning

Science - 2.4, 2.8, 4.4

English - 2.1, 2.2, 2.3, 2.8, 2.11, 2.12, 2.13, 3.1, 3.4, 3.6, 3.9, 3.10

Objective

Students will:

- Observe, investigate and sort seeds
- Study plant parts and function
- Record data
- Write a descriptive paragraph
- Compare and contrast seeds
- Discuss basic needs of seeds to grow

Materials

- Chart paper
- *One Bean* by Anne Rockwell or *How a Seed Grows* by Helene Jordan
- Paper towels
- Glue
- Magnifying lenses
- Shoe box
- Clear overhead projector sheet
- Tape
- Soil
- Seeds
- Method of watering
- Black construction paper
- Vocabulary sheet (provided)

Background Knowledge

In order to fully understand the life cycle of a plant, it is important to know the different parts of a plant and the functions of each. Through this multiple day lesson, students will have the opportunity to fully engage in the investigation of the parts of a plant and understand the function of these parts.

Vocabulary:

Cotyledon – the seed leaf

Dicot – a plant whose seeds have two sections

Embryo – the tiny plant within a seed

Flower – a part of the plant that is colorful and makes seeds

Fruit – the part of a plant that holds the seeds

Germinate – when a seed starts to grow and produces a new plant

Leaf – the flat, thin part of a plant that grows on the stem, catches sunlight, makes food, and allows gasses and water in and out of the plant

Monocot – a plant whose seeds have one section

Ovary – bottom, rounded part of a pistil in which the ovules are located

Petal – a part of a flower that often is brightly colored



Procedure

Day One

1. Use a KWL chart to determine students' prior knowledge, ascertain their questions and decide upon unit highlights.

K – what do students think they **know** about Plant Parts

W – what do students **want** to know about Plant Parts

L – what did students **learn** from the unit about Plant Parts

“**K**” and “**W**” are anticipatory set and need to be completed **before** the unit begins. “**L**” is completed at the **end** of the lesson to solidify student comprehension and retention of unit topic.

K	W	L

2. Read the book, *One Bean*, to the class. (As this book may be too easy for older elementary students, *How a Seed Grows* is a good alternative.)
3. Discuss with the students the changes the boy's bean went through in growing from a seed to a plant.

Day Two

Divide class into cooperative groups before beginning lesson.

1. Pour a few of each type of seed onto a white paper towel or into a small bowl. Teachers may personally provide more seed varieties if desired.
2. Have students observe seeds visually. Discuss names of each seed type provided.
3. Discuss varying aspects of seeds. List student generated adjectives about seed characteristics on board or chart paper.
4. Have students sort seeds by common characteristics. The cooperative group needs to agree and label the common characteristics of each set and possible subset.
5. Share group decisions. Have students explain reasons for the categories and any sub categories. Have students glue seeds to graphic organizer with appropriate labels. Display in classroom.
6. Ask students what might be inside a seed. Record answers for next lesson.

Day Three

Soak enough bean seeds over night so that each student may have one to investigate. Younger students may need a larger seed, such as a lima bean, but these are not provided in the teacher's packet.

1. Review student responses from previous lesson about what might be inside a seed.
2. Display the term “seed coat.” Have students observe the outside of their bean. The seed coat should be soft and ready to be sloughed off the seed. Brainstorm the purpose of the



seed coat. Students may make the connection of wearing a coat for protection against weather. This idea works well with understanding the protection a seed coat provides the seed.

3. Pass magnifying lenses to each student.
4. Have students carefully remove the seed coat. Observe seed and discuss observations. The bean seed is a dicot so the students will see two sides of the bean seed.
5. Demonstrate carefully pulling apart the sides of the bean seed. Allow students to discover the embryo inside the seed. Lead a class discussion as to the various parts the students discovered and their function.
6. Create a classroom plant/root viewer box.

Materials:

shoe box	clear overhead projector (acetate) sheet
tape	soil
seeds	method of watering

Steps:

- (a) Cut out one long side of the shoebox leaving at least a one-inch border.
- (b) Tape clear overhead projector (acetate) sheet to the inside border on the long side of the shoebox.
- (c) Fill the shoebox $\frac{3}{4}$ full with soil.
- (d) Place a variety of seeds against the acetate film so the seeds are visible.
- (e) Sift a small amount of soil over the seeds to provide cover.
- (f) Water gently.

The roots of the seeds will grow down along the acetate while the shoots sprout up through the soil.

Day Four

Divide class into cooperative groups. Each group will need a sheet of black construction paper. Each student needs his/her own paper and pencil.

1. Brainstorm and list types of flowers students can identify or may have seen on school grounds.
2. Take a walk through the school grounds looking for flowers which may be recognized. Make sure students carry pencil and paper for notes and drawings.
3. Have each group chose a flower to investigate.
4. Look for insects and other animals that are around the flower and observe if the insect/animals touch or land on the flower. Have students write their observations.
5. Draw a picture of the flower and the rest of the plant. Remember color, size and shape are important.
6. Without picking the flower, have students shake the flower over the black piece of construction paper. Use a magnifying glass to inspect the black paper. Make sure students write down their observations. Allow different cooperative groups to try different flowering plants.
7. Return to the classroom and lead a discovery discussion on the following questions:

How did the groups describe the material on the black construction paper?

What is the name of the material on the black construction paper?

How does the pollen from the flower get to the female flower parts?

Did any students see any different plant/flower parts than the class has already discussed? (stamen, sepal, pistil, etc)

Why do plants need to pollinate? What is the purpose of pollination?



List methods of pollen transportation.

Pollination Notes

If the flowers are high in the air with lots of pollen on and around them, then they are probably pollinated by the wind. These plants make a lot of pollen so that some of it might land on the female flower parts or another plant of the same kind. If the flowers are colorful and smell sweet animals probably pollinate the flowers. When animals drink from the flower, their bodies touch the male parts of the flower, and pollen gets stuck on them. Then, when the pollinator drinks from another flower, their bodies touch the female parts of the flower, and pollen from the first flower gets passed on.

The physical characteristics of flowers may also have an impact on the pollination of the flower. For instance, hummingbirds often pollinate red flowers that are long and thin. Bees may pollinate sweet smelling flowers. Bats, moths and other night creatures usually pollinate night blooming flowers.

Day Five

1. Plant seeds. Seeds may be planted in containers or in prepared soil on school grounds. The most prevalent mistake students make is over-watering newly planted seeds, so be careful. Soil should be slightly moist for best seed germination.
2. Complete the **KWL** chart. The last column “**L**,” what the students learned, needs to be completed.

Extension

- Use the student generated list of adjective scientific journal writing, creative writing or in word sorts.
- Use a thesaurus to find adjectives with similar meaning. Use the new adjectives in various forms of writing.
- Observe and discuss the difference between a monocot and dicot seed. Create a word wall with other words containing the prefixes mono- and di-.
- Use additional varieties of seeds for sorting and observation.
- Use root box and grow root foods, such as carrots, turnips and radishes.
- Create a Venn diagram comparing the different root types, such as taproots, shallow roots, etc.
- Research the difference between a root and a tuber.
- Bring in various forms of plant parts that humans consume. Sort according to the appropriate category. Discuss any item that seems to belong to several categories.
- Use canned fruit to demonstrate a mixture (fruit salad) while using the fruit juices stirred together to create a solution.
- Keep a running record of plant growth in centimeters.
- Create graphs displaying growth. Create class graph comparing growth rate averages.

