

Addresses NGSS

Level of Difficulty: 1

Grade Range: K-2

OVERVIEW

In this activity, students will learn about the common physical characteristics of plants. They will learn that all plants have similar parts. They will learn that different plants have parts that look different from the parts of other plants. Students will learn how plant parts help their functionality and how trees and plants contribute to human needs.

Topic: Physical Characteristics of Plants, Plants' Contribution to our Survival

Real-World Science Topics

- An evaluation of the common physical characteristics of plants
- A comparison of the unique characteristics of individual plants including their seeds, leaves, stems, and petals
- An evaluation of the relationship between plants' characteristics and their function.

Objective

After completing this activity, students should be able to identify the parts of a plant. They will be able to describe how different plant types have parts with unique characteristics. Students will also be able to discuss the need for plants and trees and how they contribute to human life. Students will share ideas about increasing trees in their community.

NGSS Three-Dimensions

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
Planning and Carrying Out Investigations <ul style="list-style-type: none">• Make observations (first hand or from media) to construct an evidence based account for natural phenomena.	3-LS3.B: Variation of Traits <ul style="list-style-type: none">• Individuals of the same kind of plant or animal are recognizable as similar but can also vary in many ways.	Patterns <ul style="list-style-type: none">• Patterns in the natural and human designed world can be observed, used to describe phenomena, and used as evidence.

Background Information

What are the common physical characteristics shared by all plants?

All plants are similar in that they have the same parts to help them grow, survive and function. All plants go through the same life cycle of growth. Plants all have roots that absorb water and nutrients. Their stems help them balance and carry their food to the other parts of the plant. Many plants have flowering parts or fruits that hold their seeds. These seeds are redistributed into the ground or soil for regrowth.

What are the ways in which a plant's physical characteristics can vary?

The physical appearance of a plant can vary greatly. Plants appearance can change according to their root appearance, stem width, height, and color, leaf color as well as whether or not it is fruit bearing. These unique features contribute to scientists labeling parts by different names.

How does a plant's physical nature directly affect its ability to contribute to our survival?

The structure of trees and plants is made to give off oxygen to contribute to the atmosphere and animal and human survival. Trees and plants contribute to human survival by going through a process called Photosynthesis (see definition below).

Key Vocabulary

Tree - a tree is the largest form of a plant having a single stem called a trunk and bearing branches

Roots - the support of the tree holding it into the ground and supplying it with nutrients necessary for survival

Stem - the main body or stalk of a plant

Petal - one of the segments of the corolla of a flower, which is a leaf like colorful substance

Oxygen - a chemical given off by a tree that humans breathe in in order to survive

Carbon dioxide - a gas that is naturally present in the air which is taken in by trees during photosynthesis

Photosynthesis - the process of a plant taking in three substances: light, water, and carbon dioxide and changing them into sugar and oxygen. The sugar is then used by plants for its food and the oxygen is given off into the atmosphere.

Materials Needed for Student Activity

- Chart paper
- Marker for chart paper
- Assorted seeds (each child will need a handful of various seeds)
- Several live plants of different appearances such as flower bearing, non-flower bearing, cactus, plants with multi-colored leaves, plants bearing single colored leaves, a large plant, and a small plant (As an alternate, you can provide pictures of various plants)
- Plastic zipper bags
- Pencils
- Crayons or colored pencils (optional)
- Drawing or plain white paper for each student
- Mystery Plant Handout (for second and third grade)

Teacher Preparation

- On chart paper, draw a large model of a flower. Include its roots, stem, petals, seeds, and leaves. Adding color to the drawing is optional, but can increase student interest and attention. Draw lines pointing to each part of the flower, but do not write the names of the parts.
- Fill a zipper bag with twenty or more assorted seeds for each child. The bags should contain a minimum of 4 types of seeds.
- Have all materials ready to use.

1. **Warm-up Activity:** Tell the students they are going to do a speed sort. “Sorting is putting things that are alike together in groups. I am going to give you a baggie full of objects. I want you to take the things out of the baggie and sort them as fast as you can.” Pass out the zipper bags filled with seeds to the students. Give them a couple of minutes to take the seeds out of the bags and sort them.
2. The teacher will lead a discussion about the contents of the bag.
 - “Who can tell me what is in the bags?”
 - “What do you know about seeds?”
 - “Do you think these seeds came from the same plant?”
 - “Why? Why not?”
 - “Why do you think seeds are different?”
3. The teacher will share information with students about plants. “All of these seeds came from different plants. Seedlings are the beginning source of life for plants and trees. Every tree type and plant type has its own unique seed. If each of these seeds is planted, it will grow into a different type of plant. Today we are going to look at some different plants and learn about their physical characteristics.”
4. Next, the teacher will focus the students’ attention on the flower diagram on the large chart paper. Then, the teacher will ask students to name the parts they know. Then, he/she will fill in additional parts. Plant parts should include: roots, stem, seeds, leaves, and petals.
5. Next, the teacher will discuss the process of photosynthesis. He/she will ask the students if they know why plants are important to humans. The teacher will use the diagram to explain the process of plants giving off oxygen into the atmosphere. The teacher should add the sun and raindrops to the diagram. Then, draw an arrow coming towards the plant from the sun and rain. Then, draw arrows going away from the plant to represent the oxygen being given off by the plant.
6. The teacher will bring out one of the live plants and tell the students its name. She will point to the parts of the plant and ask students to name the parts. Then, the teacher will do an observational drawing of the plant. An observational drawing consists of carefully observing an object and drawing a close replica of it in detail. She will think aloud as she draws the parts focusing student attention on the plant size, stem size/shape, leaf size/shape, flowers and/or other physical elements of the plant.
7. Now, the teacher will bring out the other live plants. He/she will tell the names of the plants. The teacher will ask the students to look at the plants and think of how they look different from one another. He/she will call on a few students to share ideas. Next, the students will draw a “mystery plant.” The teacher will explain to the students that they will do an observational drawing of a plant of their choice. They will look at the plant’s parts and draw a close replica of what they see. They will try to match the shapes of the stem, leaves and flower. The students will label their picture with the parts of the plant. The students will then share their drawings with a partner and the partner will guess which plant was drawn.

Second and Third Grade

Complete the “Mystery Plant” handout.

8. Finally, the teacher will select a few students to share their drawings with the class. The students will describe their plant including the shape and size of the stem, leaves, and flower petals (if applicable). The other students will guess which plant the students drew.

Extension Activity

Now that the students have learned how plants are different and how they contribute to our survival, they are going to think about how to increase the number of trees in their school community. Tell the students that they are going to work with two partners on a “Tree Improvement Project.” They are going to think of their immediate school environment and decide on a plan to plant new trees in a specific location in that environment. They should choose a location where there aren’t many trees and be able to explain why it is a suitable location. They are to draw a model showing where trees can be planted. They should label the things in their picture.

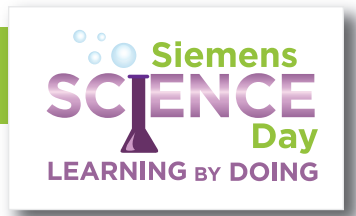
First and second graders will also write a paragraph on why this location was chosen. Second graders will write a persuasive paragraph to their school principal on why the school should plant new trees in their community.

Sources

<http://photosynthesisforkids.com/>

http://www.biology4kids.com/files/plants_photosynthesis.html

<http://ag.arizona.edu/pubs/garden/mg/botany/plantparts.html>



Name:

Date:

My Mystery Plant

Draw a sketch of your mystery plant in the box below.

Label the parts of the plant in the picture.

Were you able to identify your partner's mystery plant? What did you use to help you find the plant?
How is your plant different from your partner's plant?
