



Horticulturalist: Plant Parts

Time: 45 Minutes

Skill Level: Elementary (age 6–11), Middle School (age 12–14)

Background

What is Science Inquiry?

Children are natural scientists. From a very early age they explore the world, ask questions and seek answers. This journey of exploration and discovery is Science Inquiry. Science Inquiry helps young people understand their environment, solve problems and gain knowledge about scientific ideas and processes.

Next Generation Science Standards (NGSS)

Science and Engineering Practices

- 1. Asking questions
- 6. Constructing explanations

Disciplinary Core Ideas

- LS1: From molecules to organisms: Structures and processes
- LS2: Ecosystems: Interactions, energy, and dynamics

Crosscutting Concepts

- 2. Cause and effect: Mechanism and explanation
- 6. Structure and function

Objective

In this activity, students learn about the structure and function of plants.

About the Scientist

A horticulturalist is a type of scientist that studies plants. The word horticulturalist comes from the Latin word, hortus, meaning *garden* and the word cultus, meaning to *cultivate*. Horticulturalists investigate how to improve plant growth, yields, quality, and nutritional value. They also study a plant's resistance to insects, diseases, and environmental stresses.

The Science of Plants

For many years, living things were categorized as plants or animals. Today, we use additional classifications, such as fungi and bacteria. Plants are particularly interesting to study, since their parts and structure largely determines their properties and functions. In particular, plants are known for their ability to carry out *photosynthesis*. This process allows plants to absorb sunlight and convert it into chemical energy that can be stored and later released as food.

The Science of Plants (*continued*)

Overview of plant parts:

- Stem: structural support of the plant; stores nutrients; transfers fluids; produces new tissue
- Flower: seed-bearing part of the plant; contains the reproductive organs
- Leaves: main organs of photosynthesis and transpiration
- Roots: underground portion of the plant which obtains water and nutrients from the soil

Overview of what plants need to grow:

- Sun: provides warmth and energy
- Soil: provides a base for roots to grow and hold to. It also has many nutrients for plants.
- Air: plants take in carbon dioxide from the air to use in the photosynthesis and give off oxygen which we use.
- Water: helps plants move nutrients up from the soil to its stem and leaves

Materials List:

- Pipe cleaners
- Foam paper
- Markers
- Parts of a Plant Worksheet
- Scissors
- Glue

Discuss ... What do students know about plants? Do they know all of the parts and what it is that they do? How do plants grow? What do plants need to grow? Do the students have a favorite type of plant? Make sure that at the end of the discussion students have a clear understanding of the four main parts of a plant. You may wish to incorporate the parts of a plant worksheet into this discussion.

Experience “What to Do”- What is the plan for the investigation? Have the students engineer their own type of plant using pipe cleaners and foam paper. Make sure that students have a plant with all four parts. Encourage the students to be creative.

Share ... Once students have their plant built, ask each student to share their plant with the class. Perhaps they have a new name for this new type of plant.

Reflect ...Analyze and interpret the data and results. Discuss among the group. Does every plant that you can think of have these four parts? What are some unique plants that you can think of?

Generalize ...to real world examples. Construct explanations. Why are plants important to us? Plants provide us with food, fiber, shelter, medicine, and fuel. The basic food for all organisms is produced by green plants. In the process of food production, oxygen is released. This oxygen, which we obtain from the air we breathe, is essential to life. The only source of food and oxygen are plants; no animal alone can supply these. Shelter, in the form of wood for houses; and clothing, in the form of cotton fibers, are obvious uses of plant materials. But we must not forget fuel, furniture, paper products, certain medicines like aspirin, and many other products like perfume and chewing gum.

Apply ...outside the classroom or club meeting. Based on your understanding of plant parts, observe the plants around you and see if you can find any that are unique.

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