Learning Objectives

1) Know the functions of the plant parts.
   a) Roots function to soak up water, minerals, and nutrients from the soil. They also serve as anchors that keep the plant in place.
   b) The stem is like a highway for food and water to travel up through the plant. The stem also holds the plant up to the light.
   c) Leaves are extremely important because they produce food (glucose) for the plant.
2) Realize that a growing plant requires food, water, and sunlight.
   a) The food provided by photosynthesis and soil/compost gives the plant the energy and nutrients necessary for growth.
   b) Water is used in photosynthesis and feeds the plant by carrying nutrients and gases from cell to cell.
   c) Sunlight energy is necessary for photosynthesis.
3) Understand that plants, using sunlight, water, and carbon dioxide, make their own food (glucose) that provides energy for growth. This food is made in the leaf through a process called photosynthesis.
4) Know that plants start their life out as a seed or bulb, and understand how a seed or a bulb turns into a plant. Inside the seed coat of a seed is an embryo, which consists of one or two cotyledons and an endosperm. The embryo contains the growing information and food necessary to help the seed germinate and become a plant. When there is enough air, warmth, and moisture present, the seed will germinate and a root and a stem will begin to grow. A bulb is different from a seed because it consists of many layers and can stay dormant under the soil for a long period of time. A bulb matures into a plant in the same way that a seed does.
5) Understand that different plants require different weather condition. Some plants require cold weather conditions, while others only grow in tropical conditions. Realize that seeds and bulbs are both products of plant reproduction and understand the reproductive parts and process. Angiosperms are plants that use flowers to produce seeds. The female part of the flower consists of pistils, which contain an ovary. The male part of the flower consists of stamen, which are coated with pollen. Pollination occurs when the pollen reaches the ovary, the ovules become fertilized and are able to become seeds. After pollination, the ovary forms into a fruit, which grows until the seeds are ready to be released. Other types of plants do not have flowers, like pine trees, they are known as gymnosperms. A plant can become pollinated through self-pollination or cross-pollination.
6) Understand the life cycle of plants. The cycle begins with birth, followed by a period of maturing, then the plant dies. The length of the life cycle depends on whether the plant is an annual or a perennial. In the fall the green chlorophyll departs from the leaves. Then the leaves and flowers are dropped from the plants because they are not needed during the winter. After the period of rest, there is period of growth; plants grow new leaves and flowers, and seeds germinate and grow into plants.
7) Recognize that plants need protection to survive and continue to grow. This protection comes from thorns, poison, bark, etc.
8) Realize that plants and animals rely on each other. Animals give off carbon dioxide, which plants require for photosynthesis. Plants provide animals with food and oxygen, which animals require for respiration.

Suggested Activities

1) Before viewing the video

a) Bring a whole live plant (root, stem, leaves, and flower) to class. Hold it up for the students' observations. Ask them to tell the parts of this plant. Have older students draw the plant and label its parts.

2) After viewing the video

a) Give each student two large dry lima beans. Have them each carefully examine one of them and try breaking it apart. Soak all the beans overnight in a pie pan with a small amount of water. Now have each student try breaking one of the beans apart. What can be seen inside? Get several clear containers and place some folded paper towels inside. Do not put a lid on the container. Put the rest of the beans between the paper and the sides of the containers and put a small amount of water in each. Place them in the sunlight each day and see what happens. Students can record what is happening. Record the date, event, results, and the number of days it takes for changes to occur.

b) Photosynthesis: Have students draw an accurate picture of a plant. As a class draw the stages of photosynthesis with each student illustrating his or her own drawing. In a top corner, show the sun with energy radiating toward the plant. Show rain falling and being absorbed by the plant roots and taken to the leaves. Show the leaves taking in carbon dioxide through the stomata on the leaves' undersides and releasing oxygen. Show the chlorophyll in the leaves. The sun's energy sets off the chlorophyll, which causes the water molecules and carbon dioxide to make glucose. The plant gives off oxygen and water vapor, which people need to breathe. This is photosynthesis!

Vocabulary

Chlorophyll – The green photosynthetic pigment present in the chloroplasts of plants

Compost – Decayed organic material that is an excellent source of nutrients

Cotyledon – A fleshy leaflet inside a seed

Cross-Pollination – Transfer of pollen from one flower to another flower, wind, insects and birds are responsible for cross-pollination

Endosperm – The nutritive tissue in the seed

Ovary – Contains the ovules that develop into seeds

Ovules – The beginnings of new seeds

Reproduce – To produce new life Self-Pollination – Transfer of pollen from the stamen to the ovary of the same flower