



Plant Parts

Purpose

The purpose of this lesson is for students to learn the six basic plant parts and their functions.

Time

Teacher Preparation:
30 minutes

Student Activity:
60 minutes

Materials

For the teacher demonstration:

- ▶ White carnation flower
- ▶ Celery
- ▶ Food coloring
- ▶ Glass jar filled with water

For each partnership of 3-4 students:

- ▶ Carrot with leaves attached (tap root)
- ▶ Small corn plant, grass, or weed (fibrous root)
- ▶ Colored markers
- ▶ Newspaper

For each student:

- ▶ Toothpick or craft stick
- ▶ Paper towel

Background Information

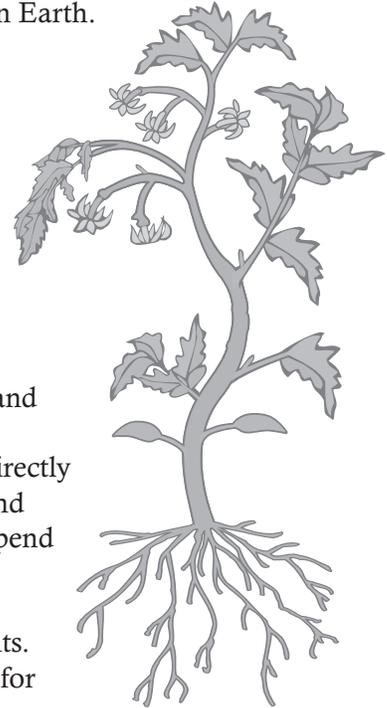
Plants are extremely important to life on Earth. They grow on mountains, in valleys, in deserts, in fresh and salt water—almost everywhere on the planet. Plants come in all shapes and sizes from the smallest seedling to the towering Giant Sequoias. Not only are plants beautiful to look at, but they also play a vital role in keeping people, animals, and the Earth healthy.

Plants provide food, medicine, shelter, and the oxygen we need to breathe. In fact, everything we eat comes directly or indirectly from plants. Herbivores (plant eaters) and omnivores (animal and plant eaters) depend on plants for survival. Even carnivores (meat eaters) depend on plants because they often prey on animals that eat plants. Plants also provide shelter and habitats for many animals.

Our precious soil also needs plants. When plants die they decompose and provide topsoil that is rich in nutrients and helps seeds to germinate and grow into seedlings. Plants also help to slow erosion because their roots hold soil in place. When plants carry out photosynthesis, they take in carbon dioxide from the atmosphere and release oxygen for us to breathe.

The basic parts of most land plants are roots, stems, leaves, flowers, fruits, and seeds. The function of each plant part is described below.

- ▶ **Roots** anchor the plants in the soil and absorb nutrients and water that are needed by the rest of the plant.
- ▶ **Stems** support the upper part of the plant and act as a transport system for nutrients, water, sugar, and starches. Photosynthesis can occur in the stem of some plants such as: cacti, celery, asparagus, and bananas.
- ▶ **Leaves** are the parts of the plant where photosynthesis usually occurs—where food for the plant is made. The green substance,





Plant Parts

- ▶ Ruler
- ▶ Hand lens
- ▶ *Plant Parts* handout (pages 13-14)

chlorophyll, captures light energy and uses it to convert water and carbon dioxide into plant food and oxygen.

- ▶ **Flowers** are the reproductive part of plants. They often have showy petals and fragrances to attract pollinators such as birds, bees, and other insects. Most flowers have four main parts: petals, stamen (anther and filament), pistil (stigma, style and ovary), and sepals. After flowers are pollinated and fertilized, they produce seeds in the ovary of the flower.
- ▶ **Fruits** are the fleshy substances that usually surround seeds. They protect the seeds and attract animals to eat them. This helps in seed dispersal.
- ▶ **Seeds** contain plant material that can develop into another plant. This plant material is called an embryo. Seeds are covered with a protective seed coat and have one or two cotyledons. Cotyledons are the food for the baby plant until it can make its own food from light and are often the first embryonic leaves of the plant.

Procedure

1. Tell students that scientists consider plants to have six basic parts. Each of these parts has an important function, or role, in the life of the plant. Have students brainstorm different plant parts and record them on the board. Responses should include roots, stems, leaves, flowers, fruits, and seeds. Explain that in this activity, the class will be taking a closer look at plant parts.
2. Use the celery or white carnation to demonstrate how water, food, and minerals are transported up a stem into the leaves. Cut the bottom of a celery stalk or carnation stem and place in water with food coloring added. Throughout the day, students will see how the food coloring travels up the stem into the leaves and flowers.
3. Divide students into groups of three or four. Distribute newspaper, carrot plant, grass plant, hand lens, ruler, and *Plant Parts* worksheet. Instruct students to lay their plants on the opened newspaper and gently spread the roots out.
4. Have students use a colored marker and draw a circle around the roots of each plant. Invite students to use the hand lens to make close observations of the roots. Ask students to compare each root system by measuring and drawing the roots on their worksheet.



Plant Parts

Content Standards

Grade 2

Science

Life Sciences 2a, 2f
Investigation &
Experimentation 4c, 4f, 4g

Next Generation Science

Interdependent
Relationships in Ecosystems
2-LS2.A
Defining and Delimiting
Engineering Problems
2-ETS1.A
Developing Possible
Solutions 2-ETS1.B

English Language Arts

Writing 7
Speaking and Listening 1a,
1c

Grade 3

Science

Life Sciences 3a

Next Generation Science

Adaptation 3-LS4.C
Growth and Development
of Organisms 3-LS1.B

English Language Arts

Writing 8
Speaking and Listening 1b,
1c

5. Brainstorm with the students why the roots look different and discuss the possibility of the different functions of the fibrous root verses the taproot. Write their responses on the board.
6. Ask students if they can see the stems on the carrot and corn plants. Explain that the carrot plant has a very small stem located above the root and below the leaves. The corn plant has a very long stem called a stalk. Monocotyledons like the corn or grass plant have a fibrous root, whereas dicotyledons like the carrot plant begin with a taproot and often grow secondary roots.
7. Have students compare the leaves of the carrot and grass plant. What do these leaves have in common? (They are green.) What is different about these leaves? (The shape, size and the veins on the leaves are different.) Explain to the students that all monocots have parallel veins. (The veins on the leaf do not intersect.) Plants that are dicots may have many different leaf shapes and vein patterns. *Monocots have parallel leaf veins, fibrous roots and flower petals in multiples of three. Examples are grasses, orchids, lilies, and palms. Dicots have net-like veins, taproots, and flower parts in multiples of 4 or 5. Examples are columbine, roses, peas, sunflowers, oaks, and maples.*
8. Ask the students why the plant leaves are green. For simplicity, share with students that plants produce their own food through a process called photosynthesis. Plants take in carbon dioxide, water, and sunlight and make glucose (sugar) and oxygen. *Plant leaves contain chlorophyll pigment which is responsible for capturing the sun's energy to carry out photosynthesis. Pigments are chemicals that absorb visible light. Chlorophyll absorbs red and blue light and reflects green light. This is why we see leaves as green.*
9. Have students discuss their observations with the class. At this point, students should be able to discuss basic plant parts and their particular functions, like transport of food and water, growth, and reproduction.

Extensions

- ▶ Wash and cut enough celery so that each student will be able to taste two stalks of cut celery. Wash and cut celery into five-inch sections. Place half of the celery in a saltwater solution (6 tbsp. salt dissolved into 2 cups water) and the other half into a sugar water solution (6 tbsp. sugar into 2 cups of water). Leave celery overnight in the different water solutions. Take the celery out



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Plant Parts

Grade 4

Science

Life Sciences 2a, 3c
Investigation &
Experimentation 6f

Next Generation Science

Structure and Function
4-LS1.A

English Language Arts

Writing 8
Speaking and Listening 1b,
1c

of the refrigerator for at least one hour before the students' taste test. Give students one of each kind of stalk. Ask them if they can taste a difference between the two different stalks of celery. Explain to students that the water moves up the stem in celery through a vascular system called the xylem.

- ▶ Go on a "field trip" around the school campus. Have students collect leaves as they walk around the campus. Ask students to sort the leaves by shape when they return to the classroom. Ask students if they can tell which leaves come from a monocot plant and which leaves come from a dicot plant (monocot plants have parallel leaves).

ELL Adaptations

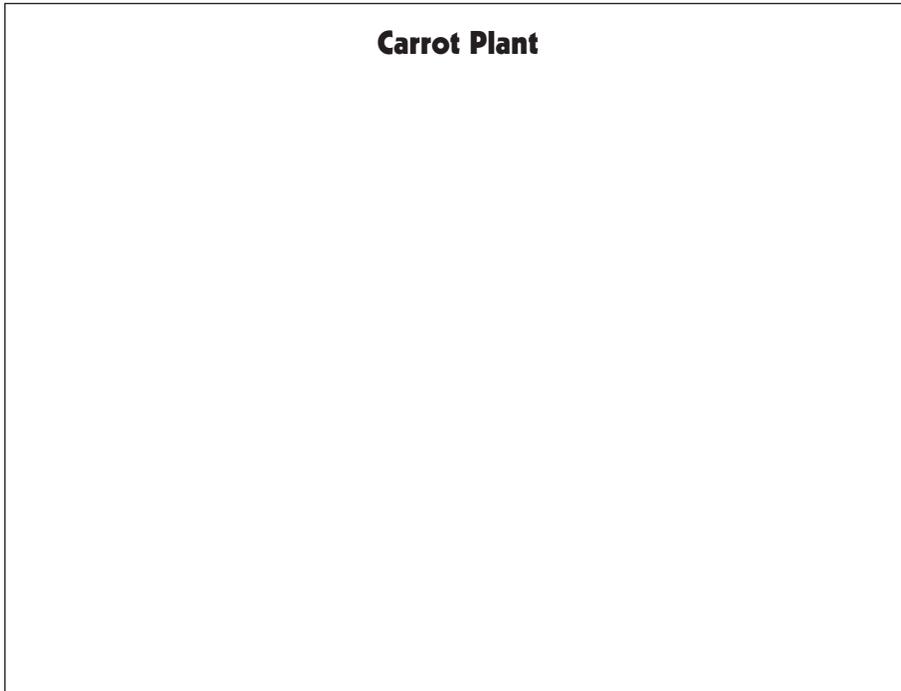
- ▶ This lesson incorporates hands-on activities. Kinesthetic learning events provide an excellent learning environment for English language learners.
- ▶ Add new vocabulary to a word wall and match photos to the new words.

Plant Parts

Name: _____

Plants typically have six basic parts: roots, stems, leaves, flowers, fruits, and seeds. Draw a diagram of your plants and label each part.

Carrot Plant



Grass Plant



Plant Parts *(continued)*

Plant Part	Description	Visual Observations
	Takes in water and nutrients.	
	Attracts pollinating insects.	
	Protects or holds seeds.	
	Collects sunlight and makes food for the plant.	
	Transports nutrients, water, sugar, and starches.	
	Contains the embryo.	