

How Does Your Garden Grow?

Plants are just like us! They require many things to grow and be healthy. Plants need water, sunlight, air and soil. But they also need NUTRENTS. The nutrients we talked about in the lab were Nitrogen, Phosphorus, and Potassium. **Nitrogen (N)**, helps plants grow strong and healthy. **Phosphorus (P)**, helps plants grow strong roots and produce flowers and fruits. **Potassium (K)**, helps plants fight diseases and turn their food into energy.



Did You Know?

Plants are just like you! They require nutrients to grow and be healthy. There are 5 steps plants go through when they grow. The first step is the **seed**. We plant seeds in soil, not dirt. There are even special places called Seed Banks. A Seed Bank stores MILLIONS of seeds to every plant, vegetable, tree or flower that ever existed in the entire world! The second step of plant grow is **germination**. A seed that has germinated will have a small sprout. After germination, is the third step of plant growth, the **stem and root** step. During this step, the roots and stem will grow in opposite directions. The roots will grow down, deep into the ground and the stem grow up towards the sky. One of the deepest root lengths ever recorded was 400ft! The fourth step of plant growth is the **seedling**. A seedling will have leaves and grow toward the sun. When a plant is grown up it is in the fifth step, **pollination**. When a plant is ready to pollinate it will grow flowers. Inside the flowers are seeds that will grow into more plants.



Seed



Germination



Roots and Stem



Seedling



Pollination

Did you ever wonder how water gets from the ground to the flower? With this experiment, you will be able to **SEE** the water moving from the glass, into the stem, and later into the petals! Here is what you do.

Materials

- white colored flowers
- water
- food coloring
- vase or drinking glass



Procedure

- Fill your glass with water.
- Add 2-5 drops of food coloring to the water.
- Place the flower into the colored water.
- Observe your flower over the next few days.

How It Works

There are three ways water moves. **Capillary action** is what allows water to move upward. **Adhesion** occurs when water sticks to surfaces that are not water, like when water sticks to the inside of the stem. **Cohesion** is when water sticks to water. Capillary action, adhesion, and cohesion all need to occur to move water from the glass to the petals of the flower.

Try this:

- Cut the stem in half and use two different colors. Do you get the same results? Why or why not?
- Use different types of flowers. For example, a daisy versus a rose. Does it change the results?

Career Corner

Soil Scientist – Soil Scientists help farmers take care of the soil. They make suggestions for applying fertilizer and ways to keep the soil healthy. Since most Soil Scientists work in a lab and do experiments they must be good observers and problem-solvers.

How Soil Scientists Benefit Agriculture:

- Conduct research that helps farmers
- Stewards of the soil

Soil Scientists Study:

- Chemistry
- Biology

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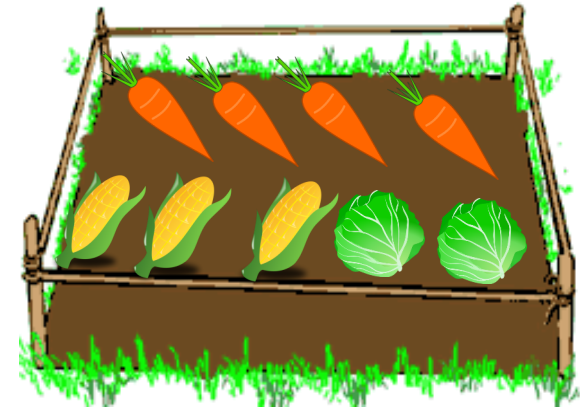
Farm Facts

- In one day, a single plant needs...
 - ⇒ 6 gallons of water
 - ⇒ 8 hours of sunlight
 - ⇒ and lots of soil!
- Some plants are carnivores, meaning they eat meat. An example of a plant that is a carnivore is the Venus Flytrap. It traps its prey between its leaves.
- Chlorophyll gives plants their green color.



Plant Problems

Solve the following word problems



How many total vegetables are in your garden?

Your friend Michael picks 1 carrot and 2 ears of corn from your garden. How many vegetables are left?



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