

Plant Nutrients on the Farm

STATION SCRIPT

Audience: 3rd grade students visiting a farm

Educator: Farm representative

Timing: 20 minutes (*read through with estimated pauses*)

“Today, we are going to talk about what plants on my farm need to grow. On this farm, we work very hard to grow _____ (*list plants on your farm*). I would like to take a few minutes to talk to you about what plants need to be healthy. **Objective:** By the end of this talk, you will understand what plants need to grow and be healthy, including nutrients in the soil.”

Water

- Each year, rainfall greatly affects my crops. On a normal year, we depend on (*briefly have students help you describe general weather patterns in the area*). Weather is a funny thing; it can help the farmer grow a good crop or the weather can harm the plants. What are some ways weather could hurt a plant? (*Take some answers, like tornadoes, thunderstorm, hail, droughts.*) Luckily, I can provide water by (*describe your watering system*).
- Now let us look at this board. These pumpkins will need water to carry moisture and nutrients from the roots to the leaves and food from the leaves back down to the roots.
- Why is water important? (*Water is essential to all life on earth. No known organism can exist without water.*) Does anyone have anything in his or her hands that could help this pumpkin patch with water? (**Rain droplets** – *have the student stick them to the board.*)

Sunlight

- What do you think would happen if you tried to grow a pumpkin plant in your closet? (*Answer a few raised hands- by third grade, most students will have learned about sun and water as essential to a plant.*)
- Why plants need light? (*Allow students to answer*)
Plants need sunlight in order to grow properly. They use light energy to stay strong and make food. This process of food productions is called photosynthesis. It’s something you will learn a lot about in science class if you haven’t already.
- Who has a source of light for this pumpkin patch? (**Sun** – *Have the student stick the sun to the board.*)

Primary Macronutrients

- In addition to sunlight and water, what else helps a plant grow on my farm? (*Soil and/or nutrients*) I spend a great deal of attention to the nutrients in the soil. They help me produce healthy crops, like _____ (*list crops on your farm*). The three main nutrients are nitrogen, phosphorus, and potassium, but today we can call them Mr. N, Mr. P, and Mr. K. N, P, and K are their symbols on the periodic table of elements. (*Have students holding the full words: **nitrogen, phosphorus, and potassium** put the words up on the board for all students to view throughout the lesson.*) As plants grow, roots take up Mr. N, Mr. P, and Mr. K and other nutrients from the soil. So after a season of crops taking up nutrients, I have to replace Mr. N, Mr. P, and Mr. K so that my crops will continue to grow plenty of _____ (*list plants on your farm*). That is why I add fertilizer to the soil. I'm careful to add it at the right time, right place, right amount (*rate*) with the right type (*source*) of fertilizer.

OPTIONAL QUESTIONS

Q: What do plants need to grow?

A: Sun, water, air, nutrients.

Q: What are nutrients in the soil?

A: Nutrients are needed for plants to grow. Many nutrients are found in the soil.

Q: How do most plants take up nutrients?

A: Through the roots.

Q: What are fertilizers?

A: Fertilizers add nutrients to the soil.

Q: What do you think would happen to plants on this farm if they had low levels of nutrients in the soil?

A: The plants would not grow well because the nutrients are needed in the right amount.

Nitrogen (N): Plants need nitrogen to be green and healthy. Without nitrogen, plant leaves will be weak and yellow. Who can spot a pumpkin plant that needs Mr. N to come to the rescue? (*Find the yellow leaf.*) Does anyone have Mr. N to come to the rescue? (*Have student add **Mr. N** near the yellow leaves. Have a student wear the **N baseball cap.***) Now that we have added Mr. N, let us fix this plant. Who has a better-looking leaf? Please hold it up in the air. (**Leaf** – *Choose the green matching leaf and have the student cover up the yellow leaf*)

OPTIONAL QUESTIONS

Q: What does the nutrient nitrogen do in a plant?

A: Nitrogen helps plants stay green and healthy.

Q: How do I add nitrogen back to the soil?

A: Fertilizer.

Q: What do leaves do for the plant?

A: Leaves take in carbon dioxide, like breathing in, and then they release oxygen back into the atmosphere. The leaf takes in energy from the sun and turns it into energy for the plant. This is called photosynthesis.

Phosphorus (P): Phosphorus helps encourage plants to grow strong and healthy roots. Phosphorus also helps the plant produce quality seeds, flowers, and fruit. Phosphorus helps a plant resist disease, too. Who can spot a pumpkin plant that needs Mr. P to come to the rescue? (*Find the three scrawny looking roots*) Does anyone have Mr. P to help this plant? (*Have the student add **Mr. P** near the weak root system. Have a student wear the **P** baseball cap.*) Now that we have added Mr. P, let's fix this plant. Who has a better-looking system of roots? Please hold it up in the air. (**Roots** – *Choose three healthy looking root system and have the student cover up the scrawny roots.*)

OPTIONAL QUESTIONS

Q: What does phosphorus promote in a plant?

A: It promotes root formation and growth. It also affects quality seed, fruit and flower production.

Q: Why are roots important? What do they do for the plant?

A: Roots hold a plant in place and take up water and nutrients from the soil.

Q: When you eat apples, what part of the apple tree is that?

A: The seed and it's protective covering. Without phosphorus, an apple tree would have trouble producing yummy healthy apples.

Q: When you eat green beans, what part of the plant is that?

A: The seeds and their covering. Without phosphorus, a green bean plant might not produce as many beans.

Q: Why do we care if there is a healthy flower?

A: The flower attracts insects by its color and smell so insects can pollinate the flower. It's like they are telling a bee, "Hey! Come over here and check this out!" After pollination, the flower makes seeds.

Potassium (K): Potassium protects plants against diseases and helps the plants when it is cold or dry. It also makes the food you buy stay fresh. Who can spot a pumpkin that needs Mr. K to come to the rescue? (*Find the mold spotted pumpkin.*) Does anyone have Mr. K that can help this plant? (*Have student add **Mr. K** near the mold spotted pumpkin. Have a student wear the **K** baseball cap.*) Now that we have added Mr. K, let us fix this pumpkin. Who has a healthier pumpkin? Please hold it up in the air. (**Pumpkin** – *Choose the healthy looking pumpkin and have the student cover the mold-spotted pumpkin.*)

OPTIONAL QUESTIONS

Q: Why is potassium important in a plant?

A: Potassium helps a plant resist disease and helps plants through droughts and cold snaps.

Q: What do stems do on a plant?

A: The stem holds the plant up. The stem is also the elevator that takes the nutrients and water to the rest of the plant.

Q: Why is it important for the food we buy to stay fresh?

A: Because we want the food, we buy to taste good and want it to be able to be eaten for a longer amount of time.

Modern Agriculture

- Farmers help to protect the environment by testing their soils to learn if the plants have the right amount of nutrients. If the plants need more nutrients, the farmer will put those nutrients in the soil by adding fertilizer. Some farmers even use satellites in outer space to help guide fertilizer application and other work on the farm.
- Who has a satellite that they can add in the sky? (*Add the **satellite** to the display board in the sky area.*)

The Agricultural Cycle:

1. The farmer takes care of his land.
2. He tests the soil and plants the seeds.
3. The seed becomes a plant.
4. The plants are watered and fed.
5. The plants flower and are pollinated by insects. Who is holding the bees? They need to pollinate the flowers. (*Add the **bees** to the board.*)
6. Food grows from the plant. The pumpkins form and grow in different shapes and sizes.
7. The pumpkins are harvested from the plant in the fall and go to the store.
8. The pumpkins go from the store to our homes to be eaten or carved for festivities.