

FUN FACES OF WISCONSIN AGRICULTURE NUTRIENTS AND FERTILIZERS



Activity Length:

What is an element? – 30 minutes

Corn Baby Activity – 10 minutes to make the Corn Baby. Follow-up activities will vary in length.

Real World Application – 45 minutes

Corn Math Lesson – 30 minutes

Student Objectives:

1. Familiarize students with scientific properties and the use of the Periodic Table of Elements
2. Understand the importance of minerals in the soil for plant production
3. Apply these minerals to real-life decisions of fertilizing flowers and gardens
4. Demonstrate how to take a soil sample and understand the information on a soil report

Wisconsin Model Academic Standards:

English	C.4.1			
Math	E.4.1			
Science	A.4.2	A.4.3	B.4.1	D.4.1

Introduction: Corny's Corn Fast Facts

Additional Information available at:

International Plant Nutrition Institute (www.ipni.net)

Iowa Testing Labs (www.iowatestinglabs.com/brochures)

Natural Resources Conservation Service at (www.wi.nrcs.usda.gov) Click on soils

Important Terms:

- Nutrient: substances necessary for the functioning of an organism.
- Fertilizer: Material that supplies nutrients for plants.
- Nitrogen: Element that exists in the air and is needed by plants to produce proteins, chlorophyll, DNA, RNA and other things. Helps the plants growth and helps keep them green. Symbol is N
- Phosphorus: Essential element required by plants and animals. The phosphate in phosphate rock ore is very insoluble and not available for use by plants. During processing, the ore is treated with acids to make the Phosphorus more available. Helps the plant trap and use the sun's energy for photosynthesis and other plant functions. Also important for developing healthy roots and fighting off diseases. Symbol is P.
- Potassium: Mined from ancient deposits formed as seas and oceans evaporated. Essential nutrient for plants and people. Doesn't mix well with other nutrients.

Potassium protects our plants against diseases and helps them stay healthy when it is cold or dry. Nearly 90% of body potassium is found in major organs and tissues, including muscles, skin and digestive tract. Symbol is K.

- Mineral: A mixture of naturally occurring inorganic compounds often mined for the useful substances they contain.
- Deficiency: Less available than needed for optimum growth.

Materials for this activity:

- Plant Nutrient Team book published by the Potash Institute (www.ppi-ppic.org)
- Wisconsin DATCP Fertilizer Labeling Requirements handout
- Samples of fertilizer bags (be sure the bag is clean) or ask a garden center or supply cooperative to give you a label from a bag
- Magazines or catalogs to cut pictures from
- Construction Paper
- Glue
- Scissors
- Jewelry sized bag
- Crystal Soil (found at garden centers) or a cotton ball
- Hole punch
- Corn seed
- Yarn or string
- Water
- Soil probe or shovel

Lesson Outline:

What is an element?

This activity may begin as part of a science class and utilize various science books and resources in addition to the Plant Nutrient Team book. You can also find element information at (www.ipni.net), (www.iowatestinglabs.com/brochures) or (www.wi.nrcs.usda.gov)

1. Break students up either into pairs or small groups.
2. Assign each group one of the following elements: Nitrogen, Phosphorus or Potassium.
3. Give them access to a Periodic Table and explain the different groups of elements.
4. Assign them to come up with three important things that their nutrient/element provides to plants and soil.
5. Discuss situations why it is necessary for these plants to receive all three nutrients.
6. Optional exercise: As students give reasons to the importance of each of the nutrients, write them down on a bulletin board.
7. After the first activity is complete, give students the opportunity to create visual representation of the importance of these nutrients.

8. Each student can be given a piece of paper and the opportunity to draw, write or choose from magazines something to represent each of the elements of importance of the nutrients.

Corn Baby Activity

1. Discuss the parts of a corn seed. Download the cross-section of a corn kernel from the National Corn Growers Association (<http://www.ncga.com/WorldOfCorn/main/kernel.asp>) or make a copy of Corn Kernel.
2. Complete the Corn Baby Activity.
3. During the weeks that the corn kernels germinate, use the results in the following ways:
 - a. Have students measure the growth each day and create a graph or chart
 - b. Have some students take their kernels out of the bag after it has germinated and plant in potting soil and watch the growth. Students can try various types of soils: potting soil, soil from a garden or sand.
 - c. Have some students leave their corn baby in the bag and see how long it can exist without rotting.

Real World Application

This activity will show students the real world application of nutrients even when they are not living on farms.

1. Utilizing sample fertilizer bag labels, or the Wisconsin DATCP Fertilizer Labeling Requirements handout, ask what the significance of each number may be. Encourage students to review what they learned about the various elements.
2. Discuss the importance of different fertilizer products.
3. Discuss how consumers would know what their soil fertility levels are?
4. Refer to the University of Wisconsin Extension Bulletin website (<http://learningstore.uwex.edu/>). Go to Lawn and Garden Section, Lawn and Turf, Care, and then download the activity sheet on Sampling Lawn and Garden Soils for Soil Sampling.
5. If you have equipment to conduct a soil sample, the students could take soil samples from the school grounds and send them in to be tested. You might also work with your school's grounds staff for assistance or the local agriculture education instructor.
6. When the results come back, discuss the results of the soil tests and determine what should be given to improve the soil fertility.
7. Using the information on the board created in the "What is an Element" lesson, ask what a fertilizer high in Nitrogen would do to a plant—what kind of plants would need that? A fertilizer high in Phosphorus? Potassium?

8. Challenge students to look around their home or stores to see where they see these fertilizer products.

Corn Math Lesson

1. Distribute Corn Math Worksheet as a classroom activity or homework assignment

Suggested Reading Materials:

- *Corn Belt Harvest*. By Raymond Bial

Additional Worksheets:

- *Amazing Corn Activity Booklet*. Sponsored by Wisconsin Corn Promotion Board
- Careers Guide related to corn
- Ag Statistics Lesson Plan related to corn

Related activities:

- Explore these nutrients roles in food and foods that are high in them.
- Soil Sammy activity
- Slice of Soil activity
- Edible Soil activity