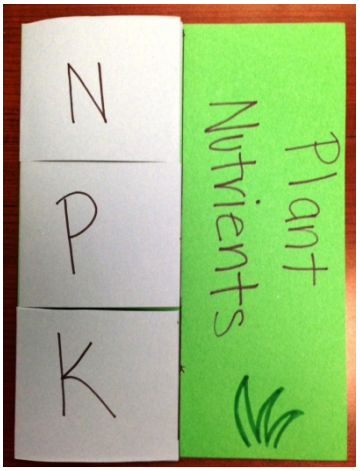
Plant Macronutrients Activity – High school



Level: High School Level

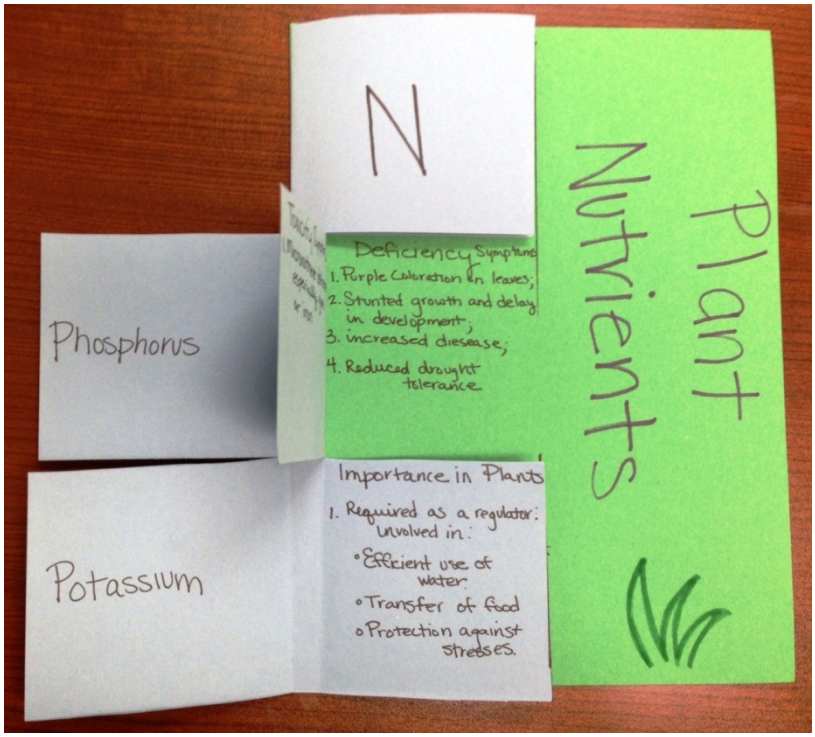
What: Paper Manipulative

Time: 15 minutes with educators

This activity is appropriate to use after introducing N, P, and K and discussing toxicity and deficiency symptoms.

Materials:

1. Two sheets of construction paper per person
2. Glue Sticks
3. Writing Utensil
4. Scissors



Directions:

1. Fold one sheet of construction paper in half horizontally.
2. Then fold the paper three times vertically and then unfold the paper.
3. Cut the paper on the three folded vertical lines.
4. Then fold a glue line so once attached to the other sheet of construction paper, the both 'pages' can flap (see visual).
5. Text:
    a. Top flap: Nitrogen
        i. Inside first flap, behind Nitrogen
            1. Component of proteins and nucleic acids.
            2. Required for chlorophyll production.
    b. Top Flap: Phosphorus
        i. Inside first flap, behind Phosphorus
            1. Component of nucleic acids and some proteins
            2. Required for energy transfer.
            3. Important for seed germination and water use.
    c. Top Flap: Potassium
        i. Inside first flap, behind Potassium
            1. Required as a regulator involved in:
                a. Efficient use of water
                b. Transfer of food
                c. Protection against stresses
    d. Next flaps:
        i. See visual: Deficiency and Toxicity on different flaps.

Plant Nutrient	Condition	Symptoms
Nitrogen	Deficiency	Light green to yellow leaves; stunted growth; low protein level; poor fruit development
	Toxicity	Dark green leaves; susceptible to drought, disease, and insects
Phosphorus	Deficiency	Purple coloration on leaves; stunted growth and delay in development; increased disease; reduced drought tolerance
	Toxicity	Micronutrient deficiencies, especially zinc or iron
Potassium	Deficiency	Yellowing on edges on older leaves, dead leaves; irregular fruit development; reduced drought tolerance
	Toxicity	Nutrient deficiencies in magnesium and possibly calcium