

Lesson Plan - Nutrient Deficiency

Time: 3 - 4 weeks; 1hr per week

Common core standards:

NGSS.3.LS3.2

Next Generation Science Standards

Grades 3-3

Standard: Use evidence to support the explanation that traits can be influenced by the environment. [Clarification Statement: Examples of the environment affecting a trait could include normally tall plants grown with insufficient water are stunted; and, a pet dog that is given too much food and little exercise may become overweight.]

Objective:

To understand the three common deficiencies of nutrients that cause stunted growth in plants

Resources:

- Three small plants in pots (preferably all the same type)
- Water
- 1 bag of sawdust
- 1 bag of play sand
- 1 bag of fertilizer
- 1 bag of soil
- 1 clay object (Break into small pieces before doing project)

Activity:

Week 1 - Getting materials set up and plants planted in designated pots

- First you will show the ppt. "What's Wrong With that Plant", which goes into detail about the three deficiencies; what they are, how they occur, and how they impact plants.
- Then you will show the class the three plants and explain that you will create the same deficiencies in these plants.
- In one pot, mix three cups of sawdust in the soil and fertilizer. Then explain what it will do (it will cause the soil to lose carbon creating a nitrogen deficiency).
- Fill the other two pots with sand, then plant the crop you wish to grow (3-4 seeds per pot). Fertilize one of the pots and not the other. The one NOT fertilized will soon create a phosphorus deficiency. Water the fertilized plant EVERY DAY and make sure that it gets lots of water (only water the other two plants as needed - every other day or so). This heavy watering and light sandy soil will cause a potassium deficiency to occur.

(Label each plant nitrogen, phosphorus, or potassium so you and the students can keep track).

- Have the students write and draw observations of the plants in a notebook.

Week 2

- Observe the plants again after watering for a week. They should begin to show the early stages of the deficiencies.
 - nitrogen - yellowing of *center* part of leaves
 - phosphorus - purpling of the leaf edges
 - potassium - yellowing of the leaf edges, leaves should also start to be curling
- Have the students write and draw observations.
- Go into more depth about how nutrient deficiencies are bad for plants and how they affect not only crops, but also farmer communities, and prices of those crops.

Week 3

- About 3 - 4 weeks later, come back with the class to observe the plants again. The deficiencies should be very visible now.
- Have the students write and draw their observations.
- Have the students come up and present to each other what differences they saw throughout the three weeks.