

## **NSTA Connection**

As we began the project in winter, young plants and seedlings would not survive outside. So, we decided to sprout seedlings inside the classroom and then transfer them outside as temperatures rise.

Students determined the ingredients that typically went into pizza sauce and then purchased seeds from the local market: tomatoes (large red cherry), oregano, thyme, parsley, and basil. The backs of the seed packets provided information about planting. We started the growing process on the same day so that we could compare the speed of growth rate among the soil and soil-less samples. Each group placed the same number of seeds of each type into each growing system. Instructions for each setup follow.

### **Growing Plants in Soil**

#### **Materials**

Cups or leftover food containers from the cafeteria (seed starters can also be used)

Seed packets

Water

Potting soil

Ruler

Marker

#### **Procedure:**

1. Read the seed packet for instructions on how to plant the seed (depth, sunlight needs, etc.).
2. Write your name and what you choose to plant on a cup. Add soil to the cup, plant the seed, and water.
3. Monitor the seedling and record its growth by measuring it with a ruler each week for 12 weeks. Take the seedling home with you on weekends and during holidays. Each week, draw, observe, and describe the seedling.

### **Plastic Bag Seed Sprouting**

#### **Materials**

Plastic zip lock bags (quart size)

Paper towels

Water

Seed packets

#### **Procedure:**

1. Select three seeds from a packet. Label a plastic bag with your name and what type of seed you will plant.
2. Dampen a paper towel in a cup of water and squeeze it out so that it is saturated but not dripping. Fold the paper towel into quarters and place it carefully into the bag. Place three seeds onto the paper towel. Blow some air into the bag to give the plant the oxygen and carbon dioxide that it needs for maximum growth in the bag.
3. Tape the bag onto the classroom window.

4. Each week, observe, draw, and describe what is happening to the seedling. This plant will remain at school.
5. Once the seedlings have sprouted, transfer them to a hydroponics system.

### Plastic Soda Bottle Hydroponics

#### Materials

Wick (An old t-shirt cut into 17cm long strips)

Legos

Rocks (from our playground)

2 liter bottles (emptied and cleaned with warm soap and water; tops discarded)

Water

Sprouts from bagged hydroponics

Lemon juice

Baking soda

Chemical splash goggles {! Insert safety note }

Scissors

Markers

Rulers

pH test kit

This activity is done best outside. {! Insert safety symbol } Teachers cut the plastic bottles in half

#### Procedure:

1. Turn the top half of the bottle upside down, and place it inside the bottom half. Fill the bottle a one-fourth full of water.
2. Dampen a wick in the bottle and thread through the mouth of the two liter bottle to create a little bed for the newborn plant.
3. Using pH test strips, determine the pH level to ensure the water isn't too acidic or basic for the plant. If necessary, add a specified amount of either lemon juice or baking soda to the water to make the perfect hydroponics system for your plant. For most plants, the solution should be slightly acid within a range of 5.5 to 6.5 (see Internet Resources).
4. Place the plant upon the wick with roots down. Use rocks or legos as a growing medium or root stabilizer.

### Watching Our Sauce Grow!

After 12 weeks of growing, we finally had enough tomatoes and herbs to make a batch of pizza sauce. Throughout this time, students observed and wrote in journals about their plants, measured and made growth charts, and even tasted some of the herbs as they were growing. We constantly heard scientific terms that we had studied previously in the year such as *embryo*, *endosperm*, and *root hairs*. We were very excited to see that our classroom lessons, text, and this investigation had met our goal: real world relevance with science, technology, and society.

This part of our investigation brought the life cycle of plants full circle. Students were able to see the plant go from seed to seedling to a full grown plant that produces a product (fruit or leaf) that is edible.

Data Table.

Method of Growth/Plant Type	Week 1	Week 2

Growth Methods: 1= hydroponics 2= traditional farming methods

Internet Resources

Hydroponics 101

[www.hydroponics101.com](http://www.hydroponics101.com)

Kids Gardening

[www.kidsgardening.com](http://www.kidsgardening.com)

Sauce recipe.

Ingredients:

6 ounces of crushed tomatoes

2 tsp of pre-minced garlic- store bought

3 tablespoons chopped parsley

4 teaspoons of onions- we got these from our cafeteria

1 teaspoon oregano

1 teaspoon basil

2 cups water

Directions:

1. Combine tomato paste, garlic, parsley, onion, oregano, basil, and water in 2 quart saucepan.

2 .Cook over medium high heat until mixture boils.

Reduce heat to low and simmer 10 minutes.

Cool a little and spread on your pizza crust and proceed with remainder of your toppings.

We received help from our cafeteria workers with cooking this—the students did the prep with an adult and the ladies finished cooking the sauce indoors.