Soil Scientist

Do you have what it takes to be a soil scientist? Let’s find out!

Break up into teams of 3-4 students. Scientists love to collaborate! Discuss the plant nutrients you just learned about (This is your **background research**). What do **you** think are some important nutrients?

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Soil scientists evaluate soil samples to decide if plants are getting enough nutrients. There are many products designed to increase soil nutrients, and some can add microorganisms to the system! You can even use everyday products to alter the soil your plant is growing in. Here are some examples of things you can add to the water and to the soil: (identify the element or compound each symbol or chemical formula stands for)

**Add to the water:** **Add to the soil:**

Soda: P Coffee grounds: N

Apple juice: citric acid Baking soda: N

Ammonia: N Cream of tartar: K

 Epsom salt: MgSO4

Can you think of any other nutrients your plant might need, and what you can give it to meet those needs that isn’t listed above? Develop a **scientific (measurable) question** relating to plant growth and nutrients \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Develop a **hypothesis** (a guess based on research) about the addition of nutrients and plant growth. Hypotheses are often written as “if, then” statements. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Design an **experiment** that will allow you to test your hypothesis. Remember, experiments should only have one variable (factor that is being tested/changed). All other aspects of your experiment should remain constant (same amount of water, light, temperature, etc…) Experiments should also include controls (same experiment, but with no changes).

My team will be adding \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the water.

**OR**

My team will be adding \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to the soil.

Write a procedure for your experiment. Don’t leave anything out!

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Observe your plant and record observations in a journal. Note any changes in color, size or number of leaves/flowers, differences in turgidity (the plant’s ability to stand upright, not wilting)

Measure your plant every few days and record the growth in a **data table**. Data tables should include a title, independent, and dependent variables.

Using the data recorded in your data table, create a graph to display the **results** of your experiment. Make sure your graph includes the data from the control as well as your own experiment.

Your teacher will designate how much time to give your plant to grow. When your experiment is over, compare data with the other teams. Whose plant grew the best? Can you figure out why? Write a **conclusion** about the effects of nutrients on plant growth based on your experimental findings. Be sure to include any experimental errors that may have occurred and how you would improve the experiment.

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