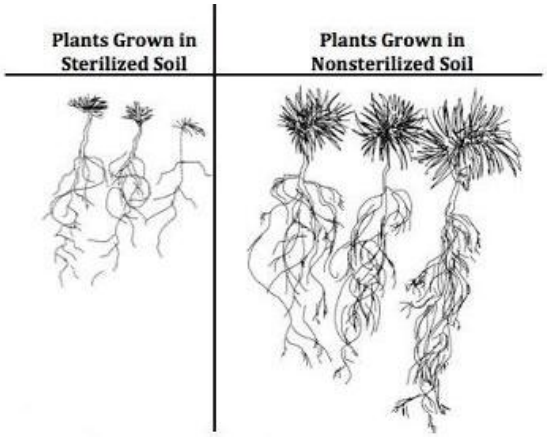
Name: _____

Date: _____

Graphing and Data Analysis Worksheet

Introduction: A mycorrhiza (my-KO-ry-za) is a mutualistic relationship between a fungus and the roots of green plants. The fungal filaments increase the absorbing surface area of the roots of the plant by aiding in the absorption of water, phosphorus, and other minerals from the soil to the roots of the plant. The plant performs photosynthesis and provides the fungus with carbohydrates in exchange.

An experiment was conducted to determine the effect of mycorrhizal relationships on plant growth. Two groups of plants were grown. One group was planted in soil that had been sterilized by high heat. The other group was planted in the same type of soil, but the soil had not been sterilized. All other factors remained the same between the two groups. The plants were allowed to grow for 8 weeks. Each week, the height (in centimeters) of each plant was measured. The picture below shows the plants after 8 weeks of growth. The data table provides quantitative data on the growth of the plants over the 8-week period. Plot the data from the experiment on the graph below.



Week	Plants Grown in Sterilized Soil	Plants Grown in Nonsterilized Soil
1	0.8 cm	2.0 cm
2	1.5 cm	5.5 cm
3	2.0 cm	8.7 cm
4	2.3 cm	10.0 cm
5	2.4 cm	12.0 cm
6	3.8 cm	16.2 cm
7	5.0 cm	19.1 cm
8	6.0 cm	25.0 cm

1. What hypothesis is being tested in this experiment? _____

_____

2. What variable is being changed in this experiment? _____

_____

3. A statement in the introduction read, "All other factors remained the same between the two groups." Make a list of factors that must remain constant in the experiment.

_____

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_____

4. Referring to question 3, why is it essential that these factors be kept constant?

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_____

5. Compare the growth of the two groups of plants in this experiment.

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6. Read the introduction and provide an explanation for why one group of plants grew better than the other group of plants.

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7. What caused the plants grown in the sterilized soil to grow so much slower than the plants grown in the nonsterilized soil?

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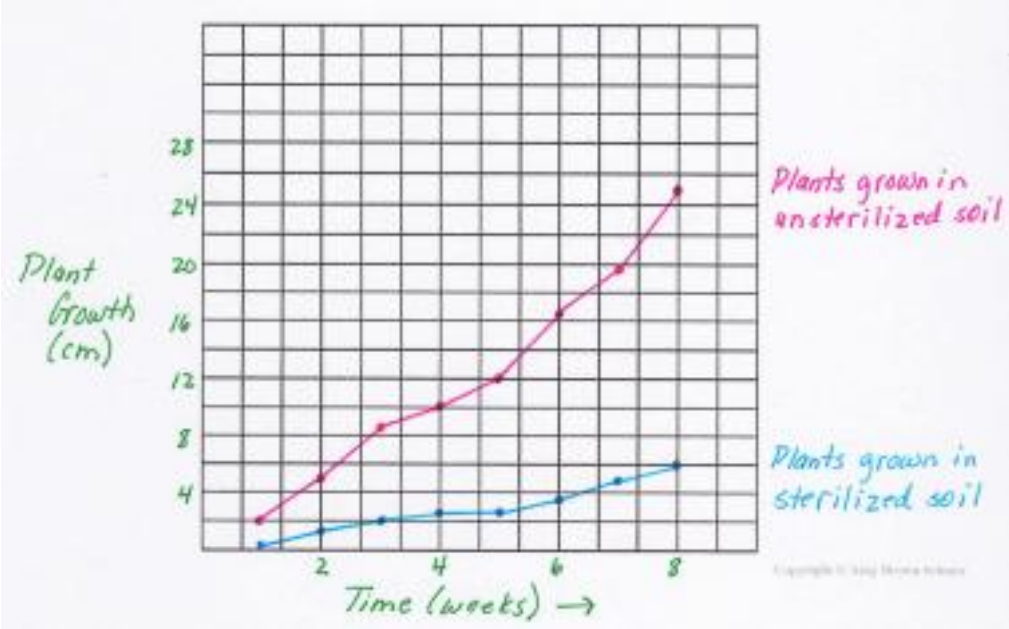
8. Does this experiment indicate that mycorrhizae are necessary for the proper growth of plants? Explain.

_____

_____

Answer Key:



1. The experiment is designed to test whether or not a living factor in the soil is necessary for the proper growth of plants. The sterilized soil will contain no living organisms, such as bacteria, fungi, etc. How will the plants grow in this sterile environment?
2. The variable that is being changed is the type of soil that the plants are grown in. The experimental variable is sterilized vs nonsterilized soil.
3. Constants in the experiment might include, but are not limited to:
   - All plants are of the same type.
   - Containers used to grow the plants are identical.
   - All plants receive the same amount of sunlight
   - All plants receive the same amount of water.
   - All plants are kept at the same temperature.
4. In a properly designed experiment, only one variable can be tested at a time. If more than one variable is changed, the researcher will not know which variable caused the observed changes in plant growth.
5. Plants grown in nonsterilized soil grew to a much greater height than those plants that were grown in the sterilized soil.
6. Sterilizing the soil kills all of the mycorrhizal fungi. The data shows that without this symbiotic (mutualistic) relationship between the fungi and the roots, plant growth will be greatly diminished.
7. The plants in the sterile (no mycorrhiza) soil were not able to take up the amount of water and mineral ions needed for proper growth.
8. Yes. Those plants that were able to grow in symbiosis with the mycorrhizal fungi were able to grow much better than the group of plants that did not have this relationship.