

# Biology internal assessment soil ph essay sample



**ASSIGN  
BUSTER**

Question: In this experiment we will investigate how the moisture of the soil affects the growth of the *Viola tricolor*.

Hypothesis: The soil that is closer to the nearest water has more moisture, meaning that the *Viola tricolor* that grow there have more access to water which leads me to believe that the *Viola tricolor* that grow there are taller than the ones that grow in the dry soil areas.

Variables

Units

Range

Independent

Distance from water

Meters

Moisture (<5m)

Dry (> 10m)

Dependent

Moisture in the soil

Grams

Controlled

The amount of soil collected in each case

Milliliters

50ml

Extraneous

Time of day, weather, season (autumn)

Apparatus:

\* Calculator

\* Scale

\* Ruler

\* 10 tubes/beakers

\* 10 flowers (*Viola tricolor* species)

\* Meter stick

Ways of treatment:

In order to collect moisture soil:

- 1.) Collect the soil that is 1 meter away from water.
- 2.) Collect the soil that is 2 meters away from water.
- 3.) Collect the soil that is 3 meters away from water.
- 4.) Collect the soil that is 4 meters away from water.

5.) Collect the soil that is 5 meters away from water.

In order to collect dry soil:

1.) Collect the soil that is 11 meters away from water.

2.) Collect the soil that is 12 meters away from water.

3.) Collect the soil that is 13 meters away from water.

4.) Collect the soil that is 14 meters away from water.

5.) Collect the soil that is 15 meters away from water.

Method

1.) Collect all the apparatus listed above.

2.) Locate a relatively dry spot ( $> 10\text{m}$ ) and a spot close to water ( $<5\text{m}$ ) using a meter stick for both cases. Once you have done this record what factors are going to affect your experiment (ex. Time of day/climate/season).

3.) Use a teaspoon or something else to scoop out soil from your selected area. It is very vital that you obtain the soil from different areas from 1-5 meters, not just one spot. Make sure you scoop the same amount of soil each time. Check by looking at how much soil you have in the beaker, in my case it was 50 ml each time. Collect at least 5 tubes of each type of soil (moisture and dry).

4.) Find the *Viola tricolor* plant that grows close to the soil. Measure the height of 5 of them for each type of soil using a ruler (try not to damage

them). Record your results. In the end you should have 5 results for the *Viola tricolor* growing in moisture soil and the one growing in dry.

5.) Return back to the lab with the acquired soil. Weight the soil you have in your test tubes (hint: weight an empty tube first so you wont have to take the soil out of the beaker in each case). Find out the average for both the moisture soil and dry. Afterwards find out the average for the length of the *Viola tricolor* in different soil as well.

6.) Return the soil back to where you took it from originally. Clean and return all the apparatus back to where it belongs.

### Data Processing

Distance from water (meters)

Weight of moisture soil (grams)

Overview: It can be clearly seen that the *Viola tricolor* that grew near the moisture soil was taller than the one which grew in the relatively dry soil. I decided to present my data in the following way using a line graph for each case instead of cramping it all onto one graph, because it is much easier to see the changes happening in each one of them. I had to manipulate data in one way or another, because initially I was given the weight of the tube+soil, and in order to get the weight of the soil alone I simply found out how much the tube weighted, and then subtracted that from the results I got previously for the tube+soil.

Ex.)

The tube weighted 10. 7 grams

Tube + soil weighted 13. 9 grams.

In order to get how much the soil weights alone I would do the following math:  $13. 9 - 10. 7 = 3. 2$  grams

Conclusion:

My hypothesis turned out to be right after all; the Viola tricolor that grows in the moisture soil is taller than the one that grows in the dry soil which supports the results that I got. My first two graphs which represent the weight of the two different soil types and the last one which represents the height of the plant show that the more moisture the soil is, the higher the plant is that grows next to it, but it must be noted that no final decision regarding the responses of plants to soil moisture can be reached from purely theoretical considerations and simple tests as the ones I have conducted.

In other to see if other sources supported the claim I made earlier I researched into it. Responses of different kind of plants to soil-moisture conditions is generally well known to farmers in irrigated areas. Water is crucial to all life and even hardy desert plants need water. In order for a plant to grow healthy there must be a balance of water, because if there is too much water then there is a chance that its roots will rot. 1 One way to understand this is to observe the effect and symptoms plants show when subjected to dry soil conditions, and the rapid recovery and resumption of growth when water is supplied to the soil. Off course in this experiment we

haven't looked at that in a very detailed way and it's a shame, but it should be common sense that most plants need water to grow otherwise what would be the point of watering them? That is why I initially chose to do this since I wanted to see with my own eyes and test if this is true.

#### Evaluation:

This experiment went fine and there are not a lot of things I would change in it if I would have done it another time. One of the problems I had was the fact that the day I conducted this experiment all soil was quite wet meaning that even the dry soil was relatively moisture. This was due to the time of day, because usually during morning hours the ground and grass is quite wet. In order to make my experiment fair I would have had to wait for the soil to dry up meaning that I should have conducted the experiment during the evening/afternoon instead of doing it in the morning.

Another problem I encountered was that it was quite hard to measure how much soil you collect each time into the beaker, because sometimes also with the soil came little pieces of rocks and other unneeded things. Even though I did regulate this by collecting 50 ml of soil into the tube each time I'm sure that I still had more and less soil than I thought I did and this might have made the experiment less fair.

#### Suggestions and improvements:

1.) In order to collect the same amount of soil next time I should use an apparatus like a mini shovel, similar to the ones children use when playing in the sandbox, which can only fit a certain amount of substance in it.

2.) Do it during evening/afternoon to make sure that not all of the soil is affected by the morning dew.

1 In How Water Affects Plant Growth. [Online]. [Cited on 27th September].

Available from world wide web: