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| **Procedure**   |  |  | | --- | --- | | **DATE** | **DESCRIPTION** | | January 19, 2001 | Radish seeds are planted, 1 seed in a pot. Two different trays with pots are used. 50 pots total. Watered with regular water, because if they will not grow, I would not be able to tell either it is the influence of caffeine or influence of some other factor. While watering, the water is being put directly on the top of the soil of each individual plant. | | January 21, 2001 | The seeds watered with regular water, none of them had shown up yet. The temperature remains low, around 0RC. | | January 23, 2001 | The seeds watered with regular water, none are showing up yet. | | January 25, 2001 | The seeds watered with regular water. 5 out of 25 in the first tray have showed up, about .8 cm above the surface. 8 out of 25 have showed up in the second tray, around the same height. | | January 27, 2001 | The seeds watered with regular water, 2 more in a tray #1 have showed up, and 6 more in a tray #2. Now I have 7 out of 25 in tray #1, and 14 out of 25 in a tray #2. Such a significant difference could be explained by the difference in the depth of location of the seeds in tray #1 and tray #2. In the tray #2 pots are not as wide as the ones in tray #1, and that is why after planting them there appeared to be more soil above the seeds in tray #1 than soil above the seeds in the tray #2, and so it is harder for plants to get out of soil and reach the surface. The temperature is still very low. | | January 29, 2001 | The seeds watered with regular water. Temperature is low. The soil is really cold. At night it is around 0RC. Plants are growing really slow. The amount of them remains the same. | | January 31, 2001 | The seeds watered with regular water. Temperature is still cold. 2 more plants in tray #2 showed up. | | February 2, 2001 | The plants watered with regular water. They are growing slowly. 1 plant in tray #2 died, and 2 plants in tray #1 died. Now I have 5 plants in the tray #1 and 15 in the tray #2. | | February 4, 2001 | The plants watered with regular water. No more newborns. Growing slowly. | | February 6, 2001 | The plants watered with regular water. Growing really slow. The temperature remains low. | | February 8, 2001 | The plants watered with regular water. 2 newborns in the tray #2. The growth rate is really slow. | | February 10, 2001 | The plants watered with regular water. No newborns. The temperature remains low. | | February 12, 2001 | The plants watered with regular water. No newborns, but 1 plant in a tray #1 died. So, now I have 4 plants in it, and 17 in a tray #2. | | February 14, 2001 | The plants watered with regular water. No newborns, the rate of growth is really slow. 1 plant in tray #2 died, and now it is 16 plants in it. I think those deaths can be explained by the low temperature that makes the soil freeze at night. | | February 16, 2001 | The plants watered with regular water. No newborns. The plants grow really slow. The temperature starts to go up a little bit. | | February 18, 2001 | The plants watered with regular water. No newborns. Plants have green color, and no taller than 4. 2 sm. | | February 20, 2001 | The plants watered with regular water. No newborns. | | February 22, 2001 | The plants watered with regular water. No newborns. Plants have the same green color. | | February 24, 2001 | The plants watered with regular water. No newborns. The color of plants is green. | | February 26, 2001 | The plants watered with regular water. No newborns. The temperature is getting higher. | | February 28, 2001 | The plants watered with regular water. No newborns. The temperature is not as cold any more. | | March 1, 2001 | The plants of the tray #2 are left for samples, the ones in the tray #1 are of no use any more and they are taken away. The plants watered with regular water. They have green color. | | March 3, 2001 | The plants watered with regular water. To replace the tray #1 plants I have planted 40 more samples � 40 pots with a various amounts of seeds in it - 2 to 5. In that way if some of them will not grow, the others will grow, so I will not have to replant them again. Also - I have 16 plants in tray #2, the old ones, so I can use them for my experiment as well, for example � to see if their growing rate in a certain caffeine solution will be higher than the one of other plants in a different caffeine solution. In that way I also will have around the same amount of samples for each caffeine solution: tray #2 � 16 plants for one caffeine solution; new tray � around 20 plants that will survive for each caffeine solution. | | March 4, 2001 | The seeds and plants are watered with regular water. Since the temperature went up, plants will need more water because the evaporation will be higher. Because of that now on I will be watering them every day, and not like before � every other day. The technique of watering them also have changed � I will be putting water on the bottom of the tray, so the amount of water needed by plants will be absorbed through the holes in the bottom of the pots with the roots of the plants. This way they will have as much water as they need. But I will visit them every day and add some more water in the trays, meanwhile making sure that the trays are in a fixed straight position, so the water will be distributed evenly through the bottom of the trays. | | March 5, 2001 | The seeds and plants are watered with regular water. Seeds have not shown up yet. The plants have a green color, and they are slowly growing up. | | March 6, 2001 | The seeds and plants are watered with regular water. Seeds have not shown up yet. | | March 7, 2001 | The seeds and plants are watered with regular water. Seeds have not shown up yet. | | March 8, 2001 | The seeds started to show up, about .7 cm above the ground. They are all watered with regular water. They all have green color. | | March 9, 2001 | The plants watered with regular water. They are slowly growing. | | March 10, 2001 | The plants watered with regular water. | | March 11, 2001 | The plants watered with regular water. They absorb water really good and none of them have died yet. | | March 12, 2001 | The plants watered with regular water. They are growing well. They have green color. The stems of the old plants from tray #2 turned dark pink, the leaves stayed green. | | March 13, 2001 | The plants watered with regular water. | | March 14, 2001 | The plants watered with regular water. Slowly growing up. | | March 15, 2001 | The plants watered with regular water. | | March 16, 2001 | The plants watered with regular water. When I touch the leaves of either one plant - I can feel how strong it is � it seems to be very strong. | | March 17, 2001 | The plants watered with regular water, they are growing. | | March 18, 2001 | The plants watered with regular water. | | March 19, 2001 | The plants watered with regular water and reached the height where it will be safe to start the project � all at once the old plants and the new ones. | | March 20, 2001 | **BEGINNING OF THE PROJECT**  The plants are watered with solutions of different caffeine concentration: 16 old ones with 25% caffeine solution; 10 pots with 50% caffeine solution � 26 plants total; 10 pots with 75% caffeine solution � 26 plants total; 10 pots with 100% caffeine solution - 23 plants total; 10 pots with no caffeine � 38 plants total, so it will be a controlled plants that I can compare to the ones that will grow on a caffeine solution. The initial data have been taken as well � the minimum and maximum temperature for the past week, the humidity of the air when the temperature was minimum or maximum, the amount of plants in each pot, the average length and width of the leaves, and the average tallness of the plants. Also � how many large, medium or small leaves on each plant. All that information you can find in the tables with data under the PROCEDURE section. Method of watering have changed � now it is not the same water for all the plants, so each one pot out of ten that belongs to one caffeine concentration group is being watered separately, putting the right caffeine concentration on the soil directly in the pot. | | March 21, 2001 | The plants are watered with caffeine solutions, but just a little bit. The reason is that the soil was still really wet, even though the weather stayed the same hot all the time. And it is a strange thing, because all the time before that the plants have been absorbing water really fast. I moved out the non-caffeine plants because the caffeine solutions of other neighboring plants could come out through the holes on the bottom of the pots and be absorbed by the roots of the plants that should be grown without caffeine in it. | | March 22, 2001 | I could notice that the old plants that are growing in 25% solution of caffeine grew up a centimeter or so, some of them. Their soil still stayed wet, and the soil of other plants stayed wet as well. I decided to water them just a little. The young plants seemed to stay the same height as they were before. | | March 23, 2001 | Some of the leaves of the plants that I am watering with caffeine turned yellow. The ones with 25% solution had the least amount of yellow leaves though � they had a very few. I watered them just a bit. No significant change in growth can be seen. | | March 24, 2001 | The plants� soil is still wet I think the leaves turn yellow because of too much moisture in the soil. That is why I decided not to water them until it dries up. | | March 25, 2001 | The soil of the 25% caffeine solution plants appeared to be dry � a good explanation for it will be that the pots that it grows in are smaller than the pots of the young plants and the old plants themselves are larger than the young ones, that is why they used up their water faster than it will take for the young ones. The soil of the young ones is wet, so I watered the 25% solution ones and didn�t water the rest of the plants. Other thing about the soil being wet � there was a big rain over the night from the 24 to 25, maybe that is why the soil stayed wet - there was too much moisture in the air. Significant difference in color can be seen between the non - caffeine plants and plants that are watered with caffeine. Even though the soil of the non - caffeine stayed wet as well as the soil of the ones that are being watered with caffeine, the non - caffeine plants remain green color and have no yellow leaves. And the yellow leaves of the plants that are being watered with caffeine feel hard and strong if you touch them. I am already starting to think if caffeine solutions might be influencing photosynthesis in my plants. | | March 26, 2001 | The soil of plants is still wet, the 25% solution ones are a little bit dry, so I watered them a little bit. There some yellowish color on the non � caffeine plants, but different from the ones that I am watering with caffeine. I think in this case it is the moisture that makes them become a little yellowish. The first half of week #2 data collection. Amount of different sizes of the leaves in each sample sizes is logged in the table. The plants besides the 25% ones are not watered. | | March 27, 2001 | The soil of the plants is still wet. I did not water them. The second half of the data for week #2 was collected. The plants are slowly growing. | | March 28, 2001 | Plants are watered. Growing slowly. | | March 29, 2001 | Plants are watered in the morning. Growing slowly. | | March 30, 2001 | Visited in the evening. The soil got very dry. Plants were very dry. Watered them. | | March 31, 2001 | Plants with non caffeine environment were damaged the most, they starting to recover. Watered them again. | | April 1, 2001 | Significant difference in the height of plants is noticed � the plants watered with 25% caffeine solution grew the tallest; 50% - taller than the 75% ones and the 100% are the shortest. The non-caffeine ones are approximately the same height as the 75% caffeine solution ones. The plants that are being watered with tap water recovering really slow and were damaged significantly in compare with the ones being watered with different caffeine solutions. Maybe caffeine protected them in some way from drying out on the sun. Because all of the plants are receiving relatively the same amounts of water. | | April 2, 2001 | The soil is wet. I did not water the plants. Third data is collected. Everything measured and recorded, the plants are growing the difference in height of plants between the groups with different caffeine concentrations are not seen as much as before, but if to look closely are still noticeable. | | April 3, 2001 | The plants are growing, but their height differs from different caffeine concentrations. Plants are not watered because their soil is still wet. | | April 4, 2001 | The plants are watered. The difference in height is not as noticeable as before. | | April 5, 2001 | Plants are watered, the ones with caffeine grow much better than the ones without it, and their leaves don�t turn yellow. Same with the ones without caffeine in the soil � leaves are green. | | April 6, 2001 | Raining all day, a lot of moisture in the air. Plants were not visited. | | April 7, 2001 | Raining all day. Plants are visited. No significant changes are noticed. The plants are watered. Growing slowly. The 25% ones are going to have flowers soon. | | April 8, 2001 | Raining all day long. Plants were not visited. | | April 9, 2001 | Raining all day. Plants are watered. No significant changes are noticed. The plants with caffeine in them seem to have more green color than the ones without caffeine in them. Could be explained by the thing that the ones with plain water in them are still recovering from drying out. | | April 10, 2001 | Forth data collection. All the data is measured and recorded in tables. Plants are watered. No significant difference in height of plants is noticed. | | April 11, 2001 | Plants are not watered because the soil is still wet. There is a slight difference in the height of plants � but not like it was before. Earlier I was observing the 50% caffeine solution to be the tallest out of non � caffeine, 75%, and a 100% ones. Now it is opposite � the 100% ones are the tallest out of non-caffeine, 75% and 50%. And their leaves have the largest surface area. | | April 12, 2001 | Plants are watered. | | April 13, 2001 | Pictures of plants are taken. Comparing non-caffeine plants with the ones with amounts of caffeine in the soil. The height and conditions vary significantly between different concentrations. The plants are not watered because the soil remained wet. | | April 14, 2001 | Plants are watered. The difference in height does not disappear. You can see the difference. Indeed, it is getting even more noticeable. | | April 15, 2001 | Plants are not watered, because the soil stayed wet. Could be caused by a slight drop of temperature for the past week. | | April 16, 2001 | Plants are watered. The difference between the heights is noticeable. | | April 17, 2001 | Fifth data collection. All the data was collected and recorded in tables. Analyzed and the results were carefully recorded in tables, and described in the conclusion part of the project. Also � a lot of comments were made during the procedure part. | | **THE PROJECT IS OVER** | |     [[Home](http://docs.google.com/home.html)][[Introduction](http://docs.google.com/introduction.html)][[Hypothesis](http://docs.google.com/hypothesis.html)][[Procedure](http://docs.google.com/procedure.html)][[Data](http://docs.google.com/data.html)][[Conclusions](http://docs.google.com/conclusions.html)][[Bilio/Links](http://docs.google.com/biblio.html)]  [[2001 Projects](http://docs.google.com/index.html)][[2000 Projects](http://docs.google.com/AP2000/index.html)][[1999 Projects](http://docs.google.com/AP99/index.html)][[1998 Projects](http://docs.google.com/AP98/index.html)] |