|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tray with a plant** | **Amount of radish plants in a tray** | **Amount of large leaves** | **Amount of medium leaves** | **Amount of small leaves** |
| #1 | 1  1 | 2  2 | 2  2 | no  1 newborn |
| #2 | 1  1 | 2  2 | 2  2 | no  no |
| #3 | 1  1  1  1  1 | 2  2  2  2  2 | 2  2  no  2  2 | 2 newborn  no  2 newborn  no  no |
| #4 | 1  1  1  1  1 | 2  2  2  2  2 | 2  2  2  2  2 | No  No  No  No  no |
| #5 | 1  1  1  1 | 3  2  2  2 | 1  2  2  2 | No  No  No  no |
| #6 | 1  1  1  1  1 | 2  4  2  no  no | 1  no  2  4  4 | 1  1 newborn  no  no  no |
| #7 | 1  1  1 | 4  2  3 | No  1  no | No  1  1 newborn |
| #8 | 1  1  1  1 | No  2  2  no | No  1  2  2 | 4  1  no  2 |
| #9 | 1  1  1  1 | 2  2  2  3 | 1  2  2  1 | 1  no  no  no |
| #10 | 1  1  1  1 | 2  no  3  1 | 2  4  1  3 | No  No  No  no |

**“No caffeine” solution – regular water**

## **Week#1**

On the same basis data will be collected every week. Instead of making a huge table the results will be analyzed and the average will be recorded during the procedure. Further the tables will be showing just the average results of data collection. The table above just shows **how** the data is being collected.

The leaves have green color, and their stems have a pale green color. The table

below shows the average width and length of the leaves:

|  |  |  |
| --- | --- | --- |
| **Sizes of the Leaves** | **Average Length** | **Average Width** |
| Large Leaves | 1.72 cm | 2.03 cm |
| Medium Leaves | 1.49 cm | 1.20 cm |
| Small Leaves | 1 cm | .7 cm |
| Newborn Leaves | .65 cm | .5 cm |

**The average high of plants is 4.08 cm.**

Totaling all the information above we can see that there is:

|  |  |
| --- | --- |
| **Size of the leaves** | **Amount of the leaves in the non – caffeine samples** |
| Large | 73 |
| Medium | 66 |
| Small | 10 |
| Newborn | 7 |

As we can see, the amount of large leaves is the biggest and then goes the medium category, while small and newborn leaves make up a very little percentage of the whole amount of leaves. What I can suggest is that the newborns #1 grow up, and when they reach medium size, a new pair of leaves starts to grow – newborns #2. Meanwhile the newborns #1 go from medium size to a large size, while the newborns #2 reach medium size, and then newborns #3 show up. So, reaching medium size for one pair of leaves will lead to the birth of new pair of leaves. Maybe that is why there are not very many newborns and small leaves – because the plants were planted at the same time and their leaves are reaching the medium size at the same time, and then the newborns will start to grow ones the current leaves will reach the medium size. The plants that are growing faster or slower than average growth rate are performing small leaves and newborns.

## **Week#2**

Data is collected on the plants, the results are shown below in the table:

|  |  |
| --- | --- |
| **Size of the leaves** | **Amount of the leaves in the non – caffeine samples** |
| Large | 57 |
| Medium | 61 |
| Small | 39 |
| Newborn | 15 |

This might seem unusual – less large leaves than was before? But remember – the size of the leaves is determined in relation to the size of other leaves in a tray – if all of them are relatively small, the largest ones will be called “large” size.

Lets talk about the leaves of the radish. The first couple of leaves as I have noticed doesn’t grow very well, they grow to a certain height, and then stay the same size, while the leaves of the second set are growing really well. So, the amount of 57 large leaves instead of 73 that we had before should tell us that some leaves that were counted as large before are not large any more in compare with the rest of the leaves – they stayed about the same size while the second pair of leaves grew up and reached the size larger than those first leaves, so now they are counted as large, and the previous large ones counted as medium in compare with the new ones that grew so high. And since there are so many medium sized leaves, more newborns and small leaves can be seen. Below you will see the table with average length of the leaves:

|  |  |  |
| --- | --- | --- |
| **Sizes of the Leaves** | **Average Length** | **Average Width** |
| Large Leaves | 2.32 cm | 1.78 |
| Medium Leaves | 1.6 cm | 1.8 cm |
| Small Leaves | 1.5 cm | 1.56 cm |
| Newborn Leaves | 1 cm | .93 cm |

**The average height of the plants is 5.3 cm.**

**Week #3**

All of the result shown below in the tables.

|  |  |
| --- | --- |
| **Size of the leaves** | **Amount of the leaves in the non – caffeine samples** |
| Large | 21 |
| Medium | 4 |
| Small | 19 |
| Newborn | 15 |

Because of the drying out on the 30th , the non-caffeine ones were damaged the most and they are recovering , that is why we can’t observe large amounts of the medium size leaves. But the dry (or dead) medium size leaves make up an amount of 24. So that is why there are many small and newborns. I would say it is because there were a lot of medium and so newborns were born and later became the small ones. And after a lot of medium leaves died out, a lot of newborns appeared. The leaved that died didn’t need the water and nutrients from the soil, so it all went to make a newborn leaves – to recover. Four out of 10 pots weren’t damaged at all. So the successful data can still be collected.

|  |  |  |
| --- | --- | --- |
| **Sizes of the Leaves** | **Average Length** | **Average Width** |
| Large Leaves | 3.36 cm | 2.22 cm |
| Medium Leaves | 2.75 cm | 1.95 cm |
| Small Leaves | 2.05 cm | 1.35 cm |
| Newborn Leaves | 1.05 cm | .48 cm |

**The average height of the plants is 6.78 cm.**

## **Week #4**

## **The results are below in the tables.**

|  |  |
| --- | --- |
| **Size of the leaves** | **Amount of the leaves in the non – caffeine samples** |
| Large | 12 |
| Medium | 30 |
| Small | 17 |
| Newborn | 30 |

|  |  |  |
| --- | --- | --- |
| **Sizes of the Leaves** | **Average Length** | **Average Width** |
| Large Leaves | 3.7 | 2.45 |
| Medium Leaves | 2.95 | 1.9 |
| Small Leaves | 2.08 | 1.38 |
| Newborn Leaves | 1.2 | .88 |

**The average height of plants is 6.94 cm.**

**Week #5**

All the data is shown below in the tables.

|  |  |
| --- | --- |
| **Size of the leaves** | **Amount of the leaves in the non – caffeine samples** |
| Large | 22 |
| Medium | 32 |
| Small | 42 |
| Newborn | 25 |

|  |  |  |
| --- | --- | --- |
| **Sizes of the Leaves** | **Average Length** | **Average Width** |
| Large Leaves | 3.81 | 2.55 |
| Medium Leaves | 2.98 | 1.93 |
| Small Leaves | 2.28 | 1.45 |
| Newborn Leaves | 1.07 | .8 |

**The average height of plants is 7.07 cm.**

The temperature and humidity were measured at the beginning of each week:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Weeks of watering with caffeine:** | **Minimum temperature of the Week** | **Maximum temperature of the Week** | **Humidity when the temperature was minimum** | **Humidity when the temperature was maximum** |
| #1 | 1ْC | 51ْC | 53% | 55% |
| #2 | 1ْC | 51ْC | 43% | 43% |
| #3 | 1ْC | 51ْC | 54% | 56% |
| #4 | 1ْC | 51ْC | 44% | 44% |
| #5 | 1ْC | 51ْC | 73% | 74% |