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| [**Home**](http://docs.google.com/home.htm)  [**Abstract**](http://docs.google.com/abstract.htm)  [**Introduction**](http://docs.google.com/introduction.htm)  [**Review of Literature**](http://docs.google.com/literature_review.htm)  [**Procedure**](http://docs.google.com/procedure.htm)  [**Data**](http://docs.google.com/data.htm)  [**Conclusion**](http://docs.google.com/conclusion.htm)  [**Cross Sections**](http://docs.google.com/cross_sections.htm)  [**Journal**](http://docs.google.com/journal.htm)  [**References**](http://docs.google.com/references.htm)  [**bonus..**](http://docs.google.com/bonus.htm) |  | **January 18**  Eugenie and I ventured out to find which plants would grow best in the least amount of time for our experiment. Our first stop was to the nursery on Vineyard because it was in such a close location. The man there was not quite understanding what we were doing or our time frame, but he did make the suggestion that we use snapdragons. These will take too long to grow I think, so we will probably stick with Mr. Theil's original suggestion to use rapid radishes because they will grow quickly and they will have stems that we can test.  **January 23**  Eugenie has ordered the rapid radish cells, and we have gone to nurseries around Pleasanton to try and find something to plant four hundred seeds in. We have decided to use the six cell squares that nurseries sell six pack plants in. We know that these are small but they are the only affordable and practical way for use to plant such a large sample size. Also, it shouldn't really matter that the space is so small until the plants start to develop their radishes, and fortunately our experience has nothing to do with the actual radishes.  **February 20**  Went over to Anna's house to see the progress of the plants. I was very surprised to see that the radishes had grown so rapidly, especially the regular, store-bought radishes that were not genetically engineered to be grown indoors under florescent light and is not expected to grow rapidly. There seems to be a problem with the second florescent lamp because it is closer to the plants and therefore encourages growth of the nearby plants. The problem will be solved when the plants are randomly distributed into groups and rotated frequently. I also wonder if the presence of the car and the heat from its engine has any effect in stimulating the growth of the radish plants nearby. On a side note, none of the herb plants that we planted for enjoyment has germinated with the exception of chamomile, which I don't personally like. We drove to Christie's house in order to obtain a fan and then found three more in my own garage. Before we could divide the plants into separate groups however, it was necessary that we label the plants and water it. The system that we are using can be seen in figure 2. The green labels represent rapid radishes of which there are 33 groups of 6 and the blue labels represent normal radishes in the same quantity. That took much longer than we expected because as we were moving the holders, individual radish plants would topple over and it became necessary to plant some deeper to keep it upright. The stems of the radish plants are very flexible and I am afraid that it might not be able to resist any level of wind. Ward's rapid radishes appeared to have more rigid stems than regular store bought radishes. Maybe that's why we paid $20 for them instead of $1.99. I'm also wondering if the usage of stilts will defeat the whole purpose of our study. After labeling the plants, we used the TI-83 plus calculator to randomly distribute the plants. The formula used was RandInt (1, 33, 11). A lapse in memory made us divide the plants into 3 groups instead of 4 so we will have to repeat this process before we can move on to procedure #3.  **February 28**  The plants do not seem to be recovering from the night we moved them into random groups for the wind testing. They are all skinny and pale, and they do not stand up straight. I think that we aren't providing them with enough light, even though the booklet on rapid radishes says that they were engineered to grow under florescent lights. Another problem might be that even though I have been watering the plants every day at my house, I don't think that the water is seeping into the soil and getting to the roots. Some of the plants have already shriveled and died. I am dreading telling Eugenie about this because it will mean that we have to start over.  **March 2**  So frustration has finally set in. our plants are really weak and appear to be dying. We had decided not to run the fans even though the plants were already above 1 inch because any amount of wind would have knocked the plants over. However, now with the exception of a few, the plants aren't standing up at all. Anna's mom thinks that they are not getting enough light, and I think that a lack of fertilizer and nutrients might also account for the sick state of the plants. Anna is watering the plants everyday but the soil still seems dry and unhealthy. We decided the only way that we could move the plants out into the sunlight was to find a greenhouse to use. If we were to just put the plants outside then they would be all subjected to wind. (Which actually now that I think about it wouldn't be so bad because we would still have a control) Anna's neighbor has a greenhouse and so we went over to ask them if we could use it. After a couple of interesting incidences with a newly sociable dog named Mango and some awkward phone messages, we were able to talk to Mr. Barrazo (I hope I spelt his name correctly). He was very nice and helpful and offered us the use of his greenhouse. Tomorrow afternoon, we will be transporting the plants to a new home where hopefully they will grow stronger.  **March 7**  We planted the new plants today. We decided not to order the rapid radishes again because previously, there was no difference in growth rate. When we pulled all of the dead ones out, we discovered that they really weren't dead. Under the soil, with enough water and sunlight, they were beginning to grow again. The resistance of these plants is remarkable. We kept the same soil that we had last time and randomly distributed the seeds. They are being kept in watering trays with 1cm of water. We managed to get the trays for free (that's a good word) from gardening stores.  **March 8**  We set up the fan system today. We got giant foam presentation boards from my house which are sturdy enough not to be effected by the wind and large enough to make sure that no wind gets transferred between the various groups. We're starting the wind now so that the seeds will be exposed as soon as they germinate.  **March 9**  Anna turned on the fans for the first time and ran them for an hour.  **March 10**  Ran fans  **March 11**  Ran fans  **March 12**  Ran fans. We also took our first measurements today. They do not seem to be growing nearly as fast as the previous radishes but they are clearly healthier. The stems are thick and sturdy, as well as red. The foliage is a deep shade of green. There is such a difference between these and the previous plants. The measurements are taken in centimeters from the top of the soil to the top of the highest leaf. This is the section that is exposed to the wind. We took a ruler and cut it off so it begins immediately at 0 for this purpose  **March 13**  Ran fans  **March 14**  Ran fans. More measurements. The plants are definitely growing at a slower rate. They are between 1 and 3 cm whereas the previous plants have reached 8-12 cm in the same period of time. I think that because the previous plants were deficient in water and light, they just grew and grew in search of a light source and so their growth upwards was very fast but they did not build anything besides height. They were also extremely fragile and their stems bent easily.  **March 15**  Ran fans  **March 16**  Ran fans Measurements of plants. We got the micrometer from Mr. Hall yesterday and learned how to use it. It's really difficult to measure the width. Instead of measuring every single stem, we decided that one from each group of 6 would be a sufficient sample. Using the calculator, we randomly picked a cell from each and measured it. Today we also fertilized the plants. They look very healthy.  **March 17**  Ran fans Today we measure the plants, both their width and height. Then we drove around to various places to try to find a display board but that wasn't successful.  **March 18**  Ran fans. Wow, we did just about everything today. After school we went and researched. Then we went to Anna's and the greenhouse for measurements and measurements, and more measurements. We took the pH level of the soil as well to make sure that there was no lurking variable in the soil. We used the random number generator to design a stratified random sample to select 4 plants from each group. We took them and sliced the roots off. Then we melted clear wax, poured it in a nut and bolt contraption and then stuck the root in as straight as possible. We it set we too a brand new razor and made cross sections.  **March 19**  Ran fans. We were in Mr. Thiel's room for a record amount of time, 6 hours and 58 minutes, almost beat Amar, but he stayed until 7. We took the slides that were prepared the night before and stained them and dissolved the wax with alcohol. The cross sections had become dried out overnight and the liquids didn't do enough to help so the initial slides were useless. We made some fresh slides and some of them came out beautifully. Anna went home to collect samples from low and control. We froze Mr. Thiel's computer and so that was the end of that. We went home and Anna worked on her research of strengthening tissues and I did statistical analysis. If I have to type one more number into my calculator…  **March 20**  It's the day before the fair and we have so much to do, good side of it is that we have already gotten so much done. YA! If only there was an award for the most amount of everything done in two days. I'm only going to list what we did today so I can go to bed.  Statistical analysis of height differences between plants  Went to Mr. Thiel to make a copy of the stem slides. Wanted to get examples of low and control group as well.  Worked on poster board for a VERY long time and wrote information for both the booklet and the poster. Finished all the statistical analysis, recommendations and results. In short the project is now done…enough for the fair at least.  note: journal is not 100% complete, only meant to give a glimpse of our research timeline. |