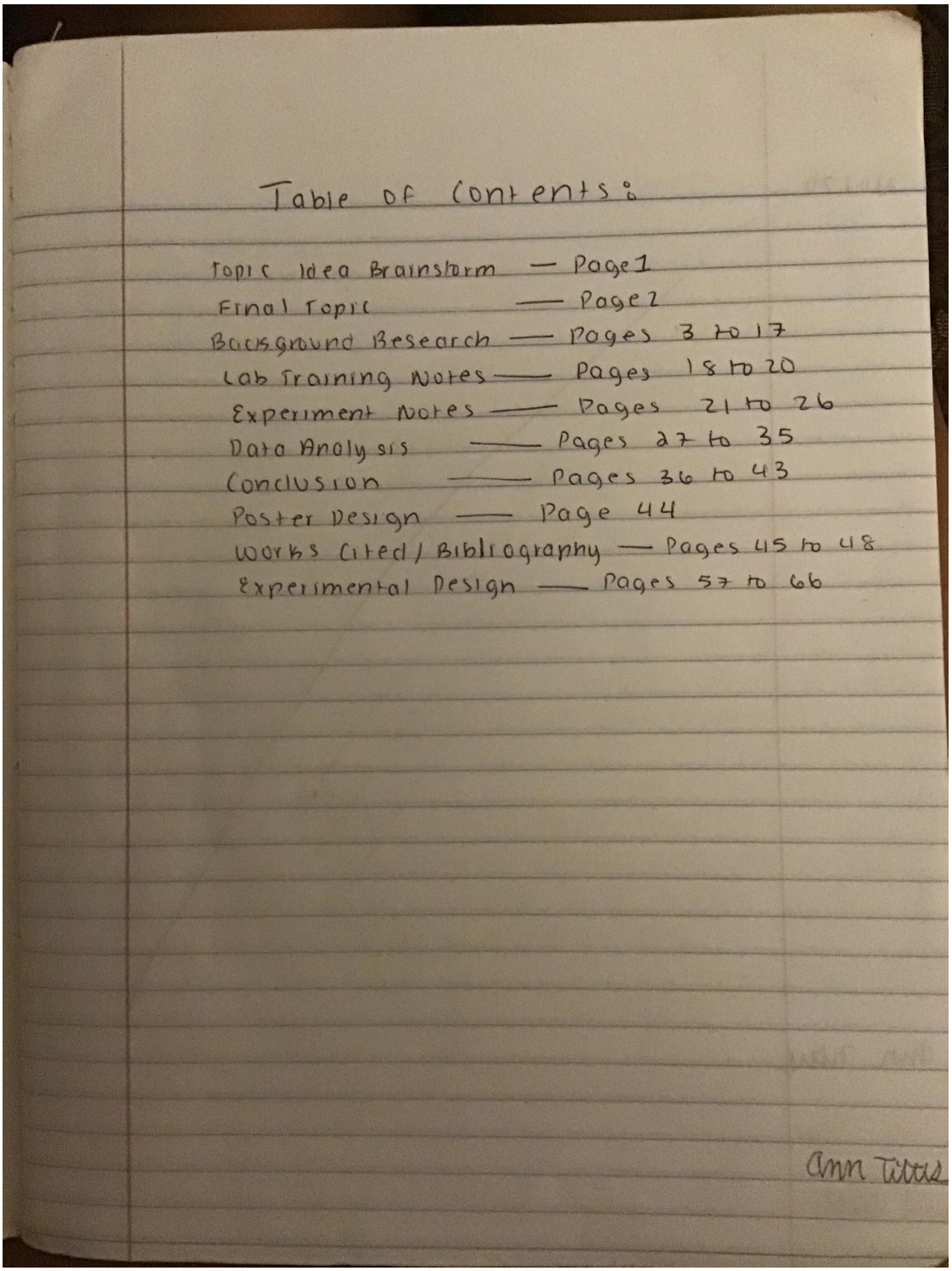
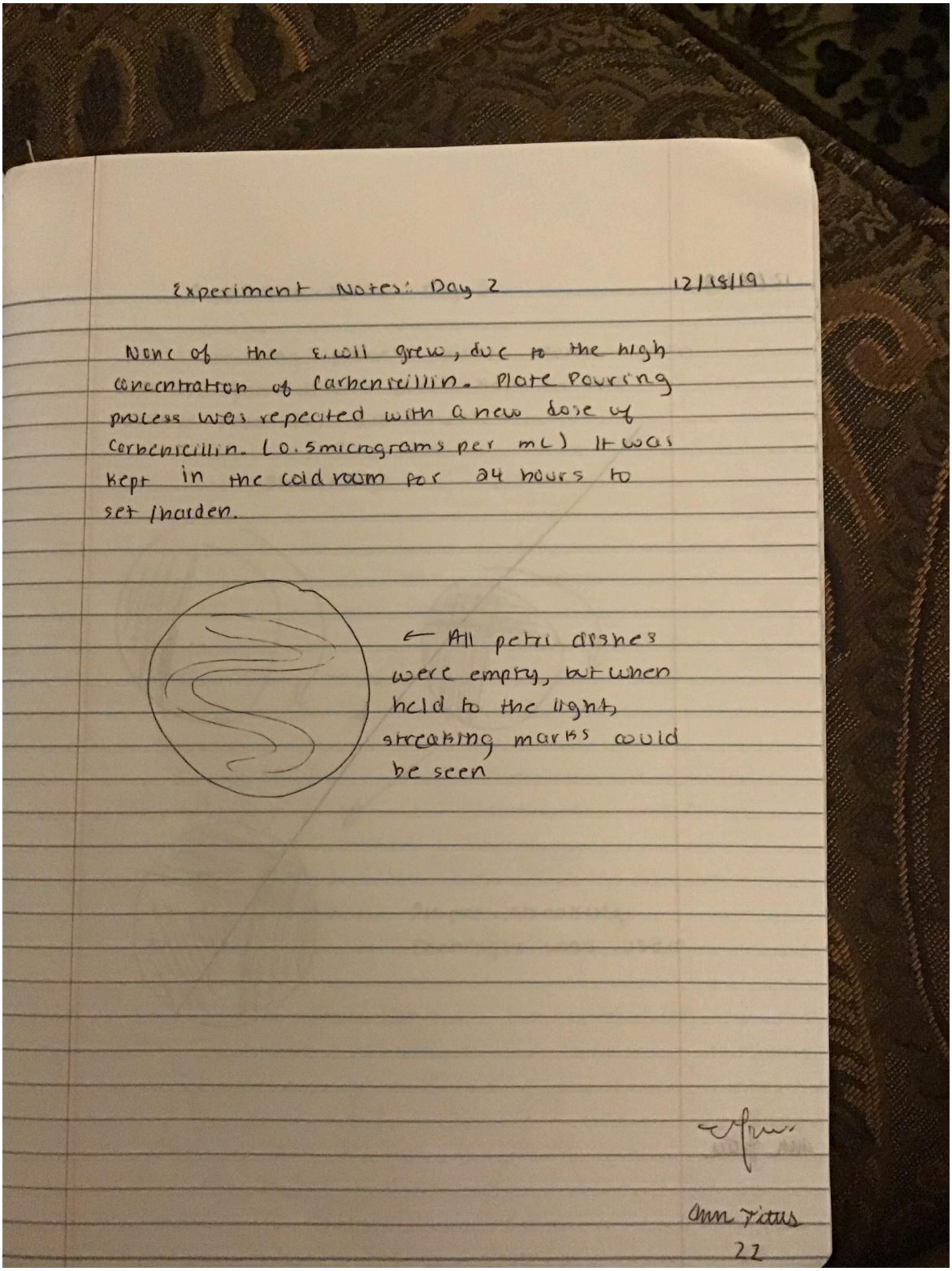
SETTING UP YOUR NOTEBOOK: VISUAL EXAMPLES

The **Table of Contents** should include the main parts of the scientific notebook as well as the pages in which they can be found.



Page numbers should be located on the bottom corner of each page, including the pages that are unused.



Experiment Notes: Day 2 12/18/19

None of the E. coli grew, due to the high concentration of Carbenicillin. Plate Pouring process was repeated with a new dose of Carbenicillin. (0.5 micrograms per mL) It was kept in the cold room for 24 hours to set/harden.

← All petri dishes were empty, but when held to the light, streaking marks could be seen

Ann Titus

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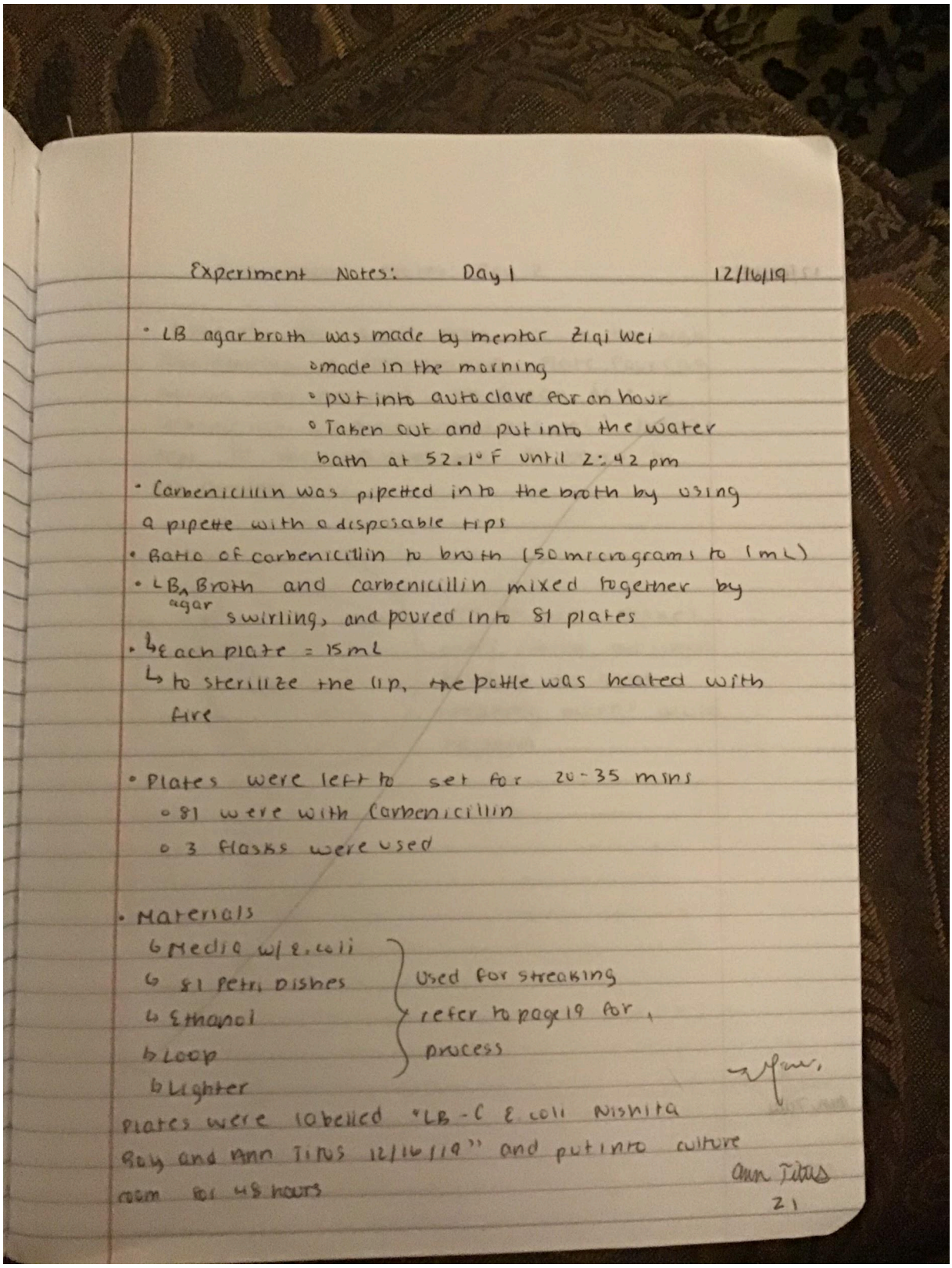
Each page should also have your **signature** on it, and if conducted with a mentor, then that page should have their signature as well.



Experiment Notes: Day 1 12/16/19

- LB agar broth was made by mentor Ziqi Wei
  - made in the morning
  - put into autoclave for an hour
  - Taken out and put into the water bath at 52.1° F until 2:42 pm
- Carbenicillin was pipetted into the broth by using a pipette with a disposable tips
- Ratio of carbenicillin to broth (50 micrograms to 1 mL)
- LB agar Broth and carbenicillin mixed together by swirling, and poured into 81 plates
- Each plate = 15 mL
  - to sterilize the lip, the bottle was heated with fire
- Plates were left to set for 20-35 mins
  - 81 were with Carbenicillin
  - 3 flasks were used
- Materials
  - Media w/ E. coli
  - 81 Petri Dishes
  - Ethanol
  - Loop
  - Lighter

  } Used for streaking, refer to page 19 for process

Plates were labelled "LB-C E coli Nishita Roy and Ann Titus 12/16/19" and put into culture room for 48 hours

Ann Titus

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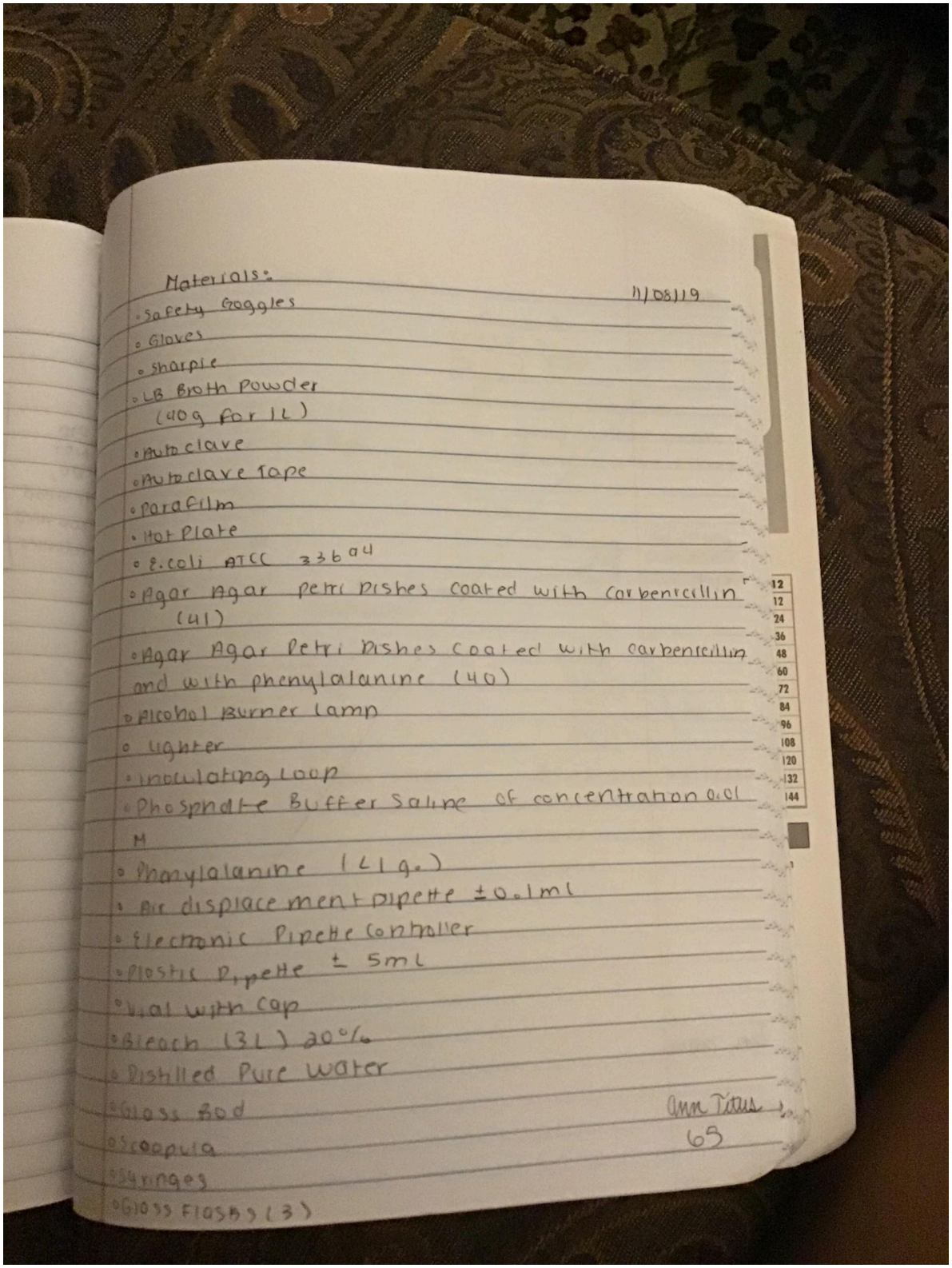
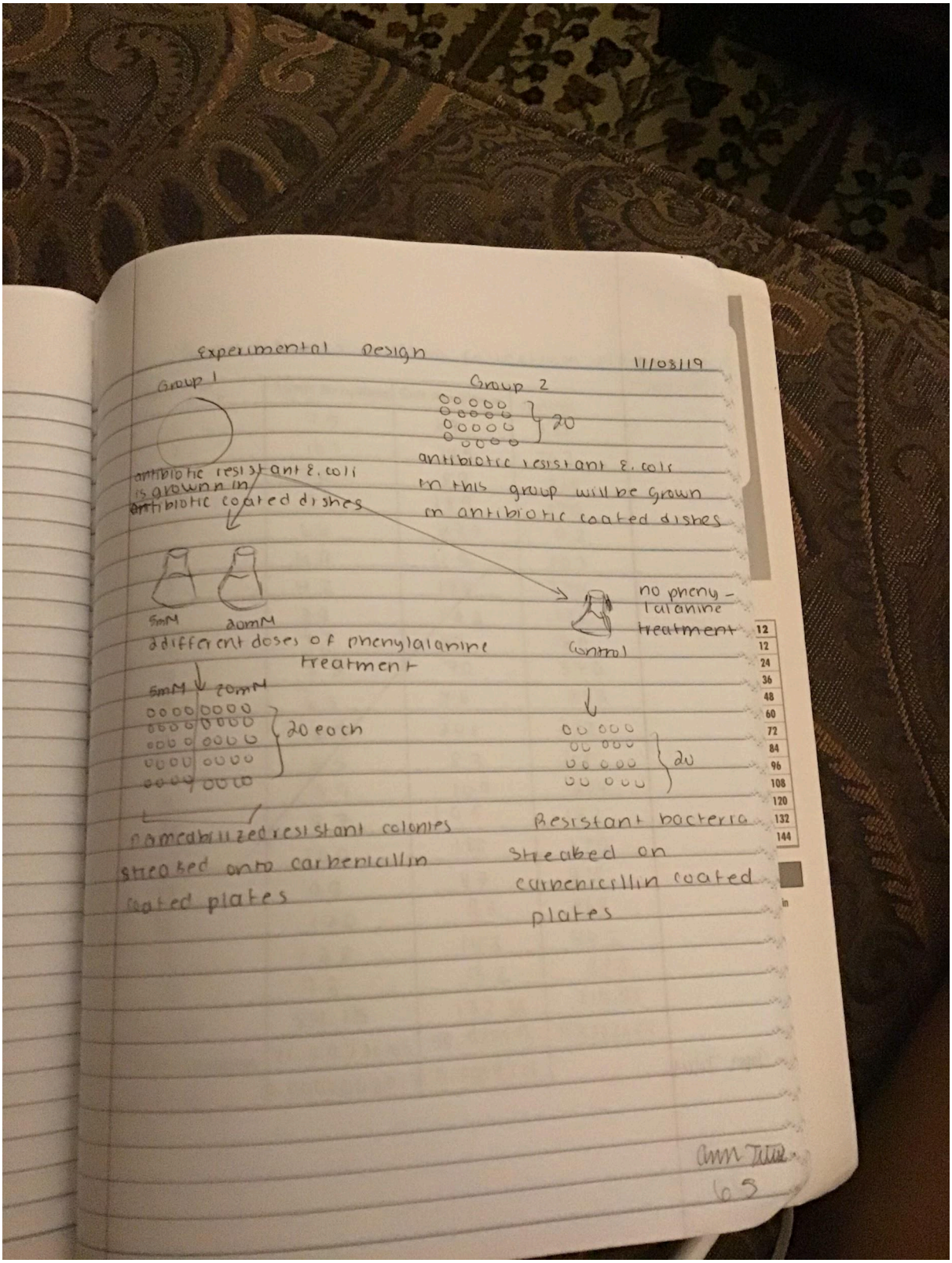
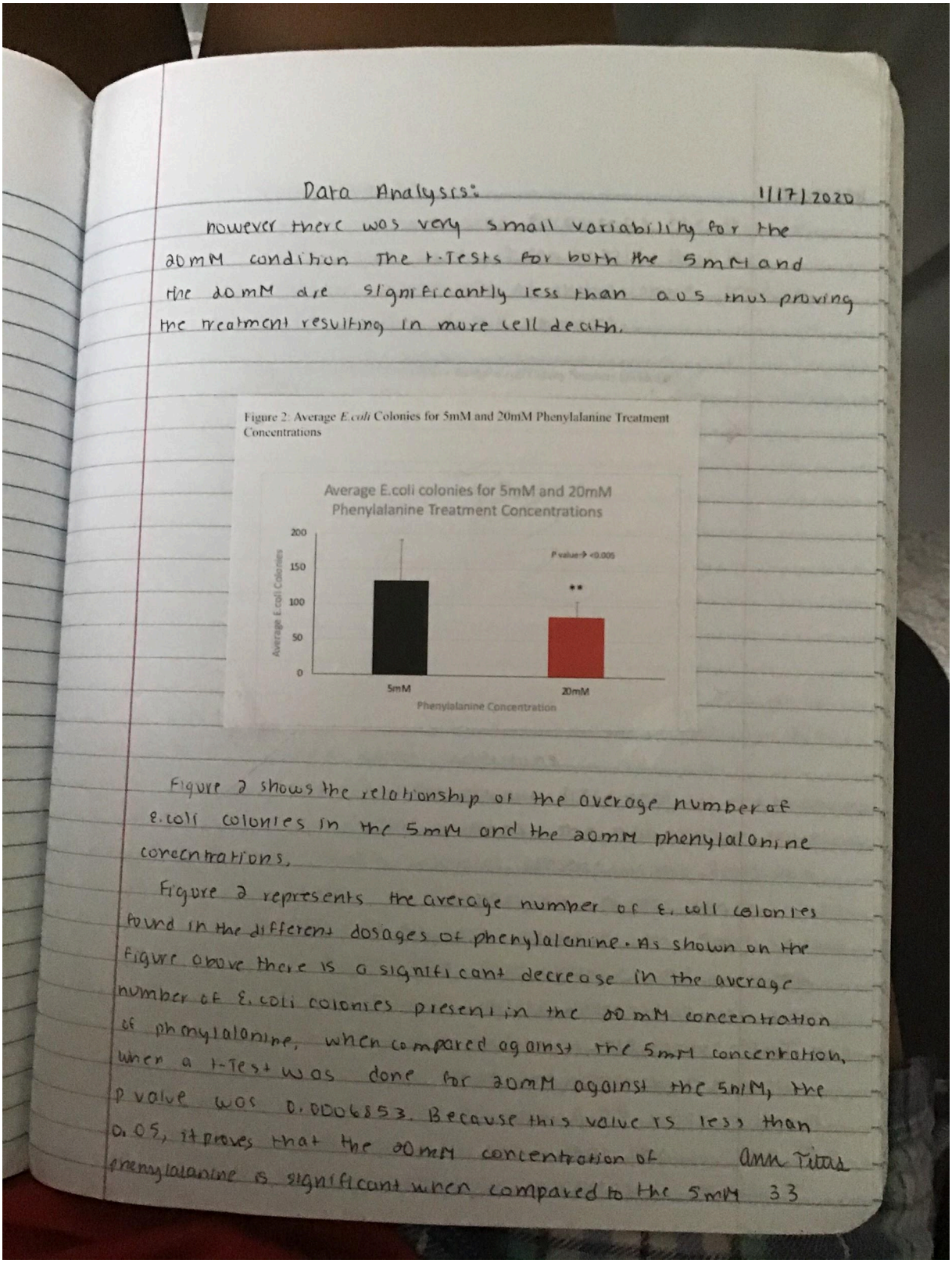
Before the procedure, the **list of all materials** must be given, so that if someone else were to conduct this experiment, they would receive the same results.



The **experimental design** must highlight what is being manipulated, as well as a brief outline of how you plan on conducting your experiment.



You can print out and paste in **graphs** and **charts**. When analyzing data, it is important to insert the figures created with the data.



Data Analysis: 11/17/2020

however there was very small variability for the 20mM condition. The t-Tests for both the 5mM and the 20mM are significantly less than 0.05 thus proving the treatment resulting in more cell death.

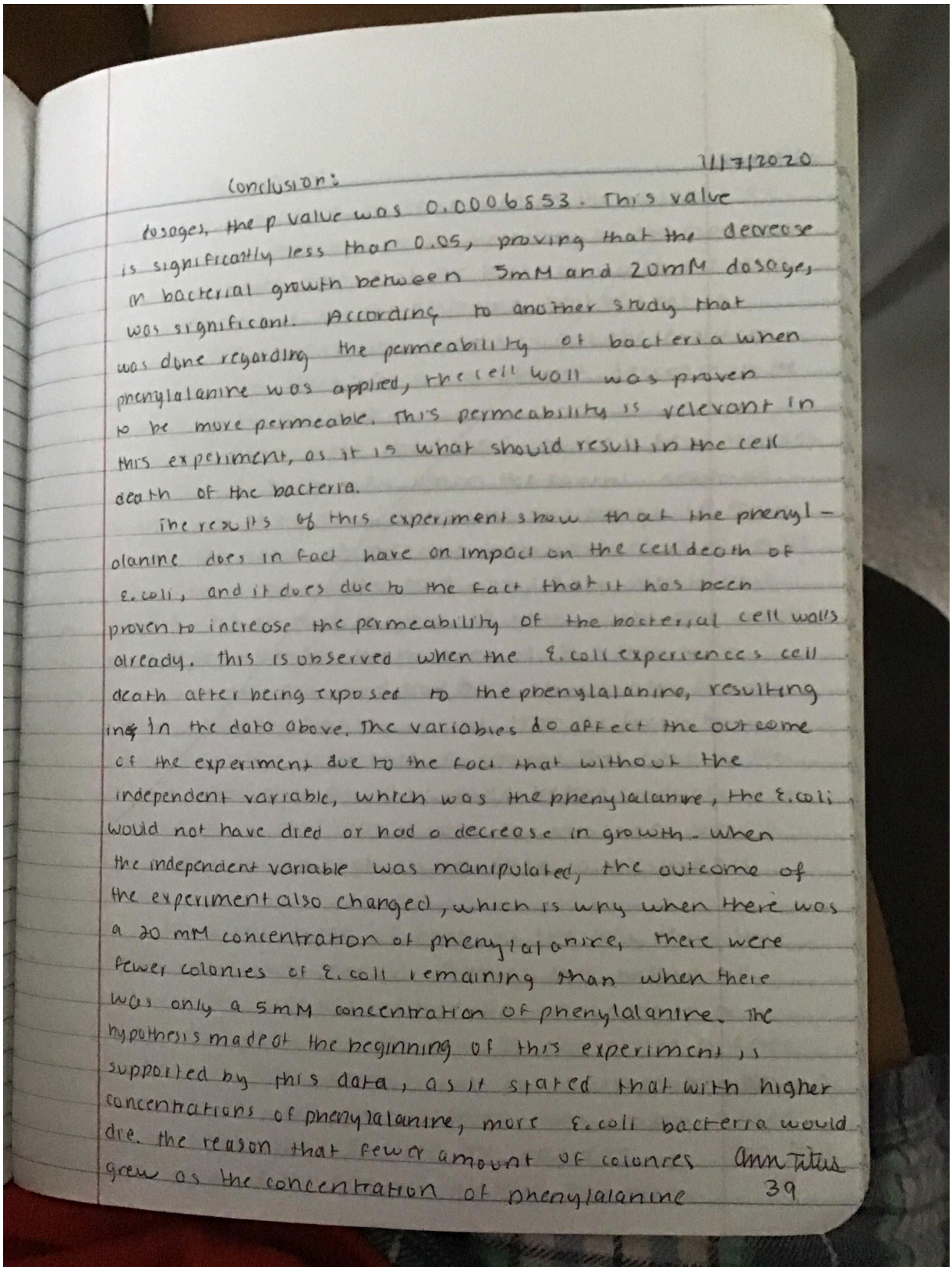
Figure 2: Average *E.coli* Colonies for 5mM and 20mM Phenylalanine Treatment Concentrations

Figure 2 shows the relationship of the average number of E.coli colonies in the 5mM and the 20mM phenylalanine concentrations.

Figure 2 represents the average number of E. coli colonies found in the different dosages of phenylalanine. As shown on the figure above there is a significant decrease in the average number of E. coli colonies present in the 20 mM concentration of phenylalanine, when compared against the 5mM concentration. When a t-Test was done for 20mM against the 5mM, the p value was 0.0006853. Because this value is less than 0.05, it proves that the 20mM concentration of phenylalanine is significant when compared to the 5mM

Anh Titus 33

In the **analysis** portion, the importance of said data must be stated, and what can be inferred from the results of this experiment.

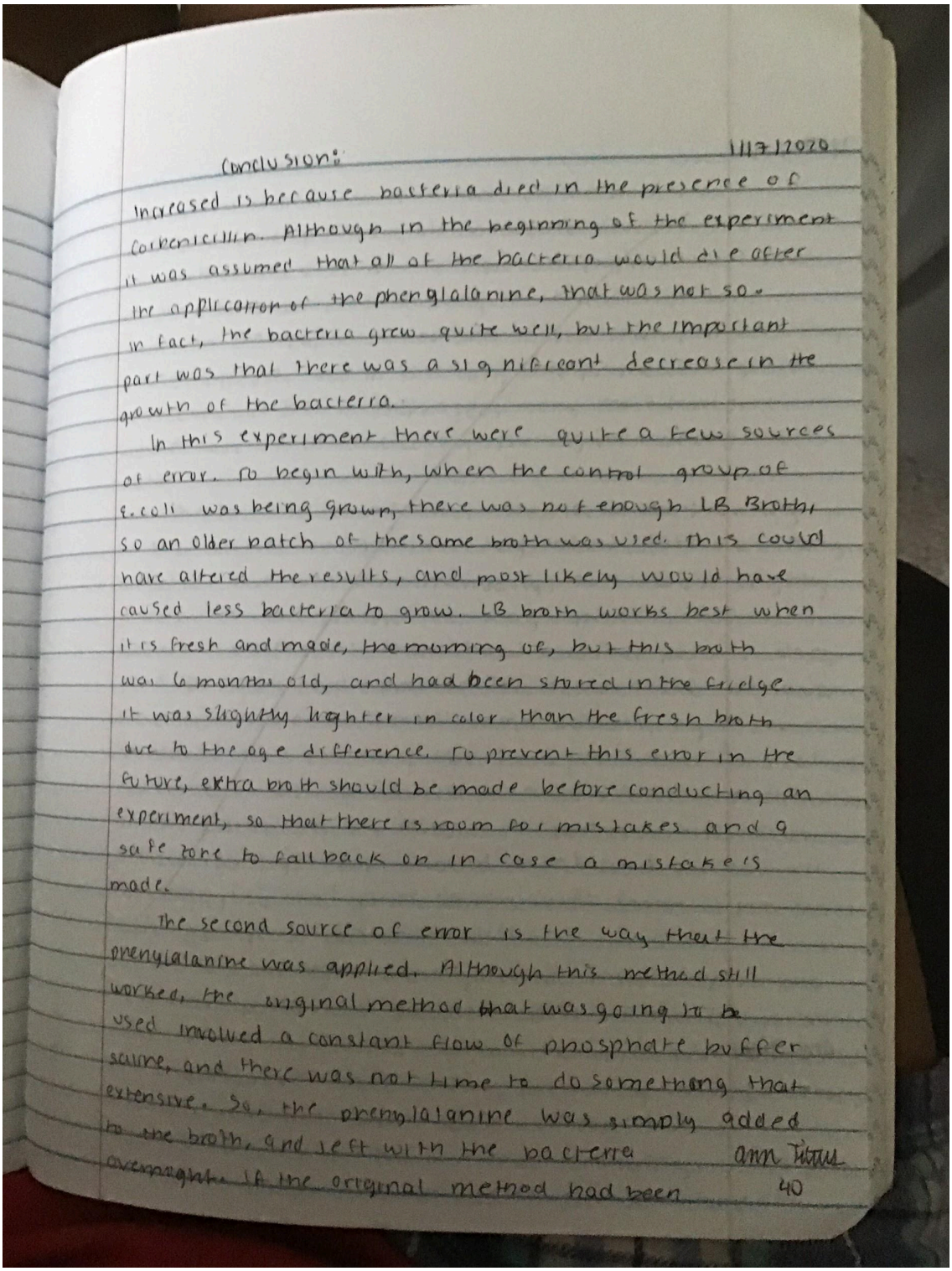


Conclusion: 11/7/2020

dosages, the p value was 0.000685 3. This value is significantly less than 0.05, proving that the decrease in bacterial growth between 5mM and 20mM dosages was significant. According to another study that was done regarding the permeability of bacteria when phenylalanine was applied, the cell wall was proven to be more permeable. This permeability is relevant in this experiment, as it is what should result in the cell death of the bacteria.

The results of this experiment show that the phenylalanine does in fact have an impact on the cell death of E. coli, and it does due to the fact that it has been proven to increase the permeability of the bacterial cell walls already. This is observed when the E. coli experiences cell death after being exposed to the phenylalanine, resulting in the data above. The variables do affect the outcome of the experiment due to the fact that without the independent variable, which was the phenylalanine, the E. coli would not have died or had a decrease in growth. When the independent variable was manipulated, the outcome of the experiment also changed, which is why when there was a 20 mM concentration of phenylalanine, there were fewer colonies of E. coli remaining than when there was only a 5mM concentration of phenylalanine. The hypothesis made at the beginning of this experiment, is supported by this data, as it stated that with higher concentrations of phenylalanine, more E. coli bacteria would die. the reason that fewer amount of colonies Ann Titus grew as the concentration of phenylalanine 39

Even if the hypothesis is supported, there will still be **sources of error** that can not be controlled or regulated, and these must be discussed because they may have caused slight inaccuracies within the data. It is crucial for the scientific community to know this information.



Conclusion: 11/7/2020

Increased is because bacteria died in the presence of Carbenicillin. Although in the beginning of the experiment it was assumed that all of the bacteria would die after the application of the phenylalanine, that was not so. In fact, the bacteria grew quite well, but the important part was that there was a significant decrease in the growth of the bacteria.

In this experiment there were quite a few sources of error. To begin with, when the control group of E.coli was being grown, there was not enough LB Broth, so an older batch of the same broth was used. This could have altered the results, and most likely would have caused less bacteria to grow. LB broth works best when it is fresh and made, the morning of, but this broth was 6 months old, and had been stored in the fridge. It was slightly lighter in color than the fresh broth due to the age difference. To prevent this error in the future, extra broth should be made before conducting an experiment, so that there is room for mistakes and a safe zone to fall back on in case a mistake is made.

The second source of error is the way that the phenylalanine was applied. Although this method still worked, the original method that was going to be used involved a constant flow of phosphate buffer saline, and there was not time to do something that extensive. So, the phenylalanine was simply added to the broth, and left with the bacteria overnight. If the original method had been

Ann Thrall

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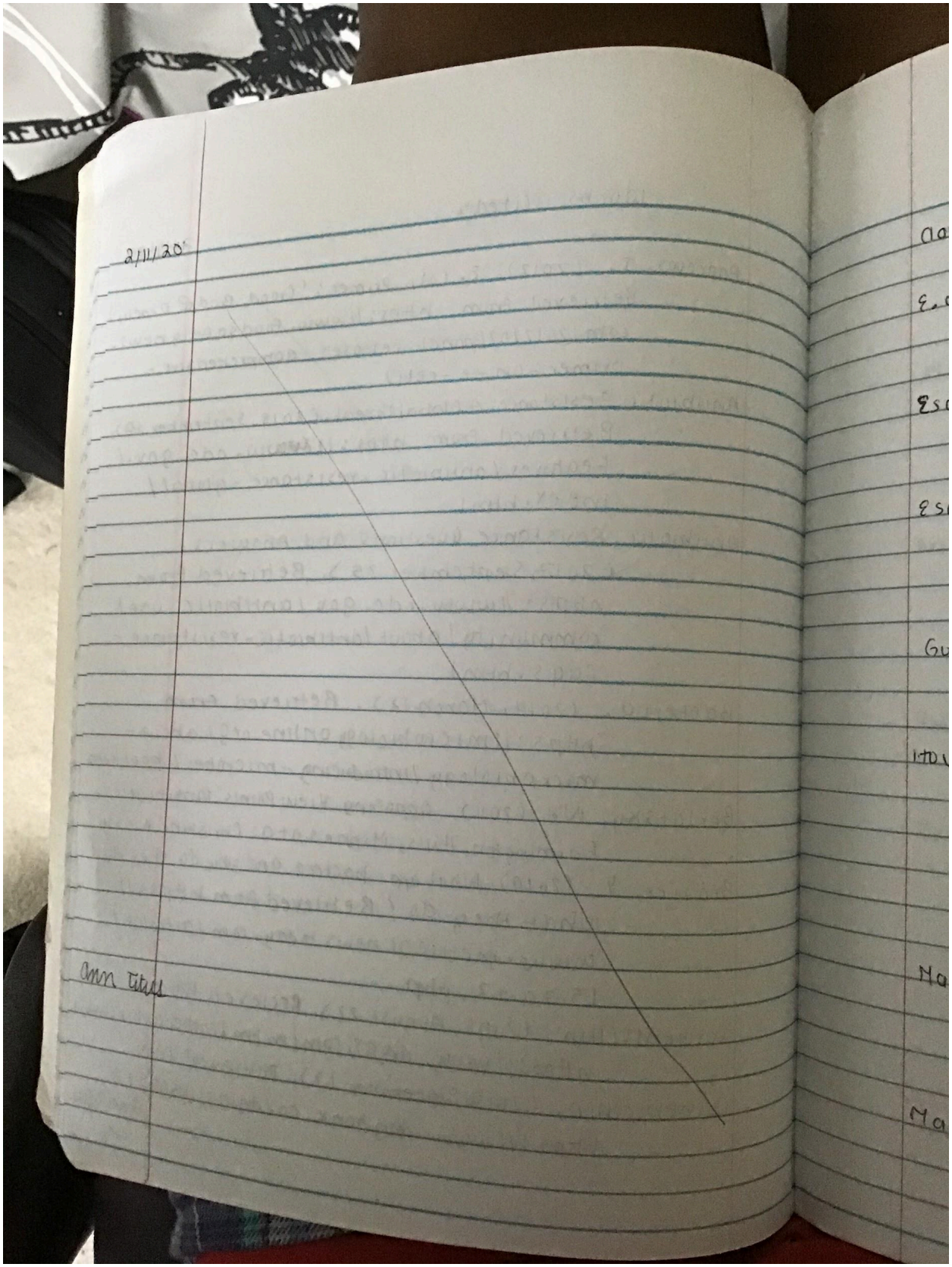
The **backs of pages** must not be written on, and you can add a line crossing it out.



If a **mistake** is made, it should not be covered with white out, a single line should be drawn, crossing out the mistake so that people reading the notebook can still see and understand what the mistake was. Also, all tables must be hand drawn.

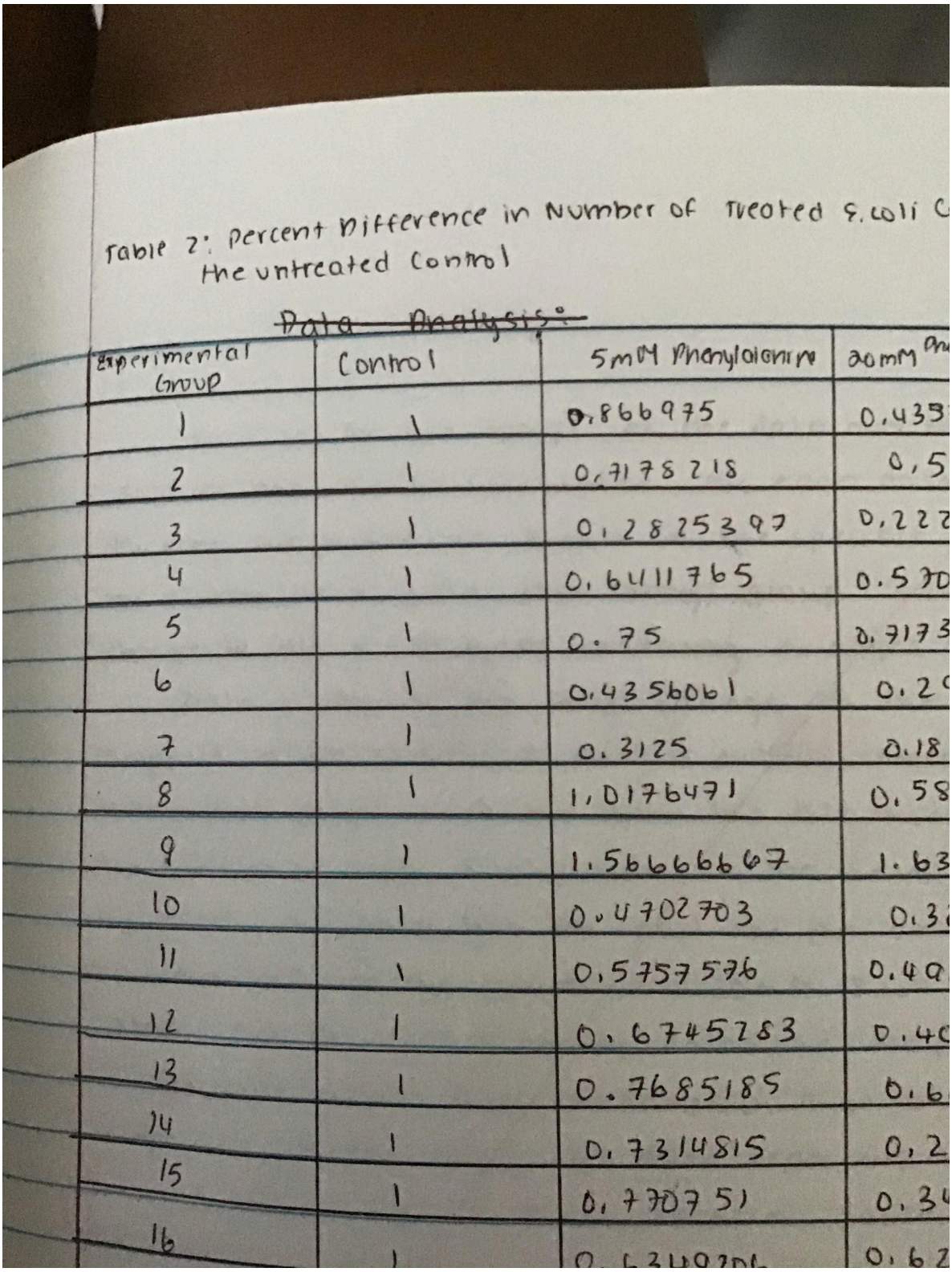
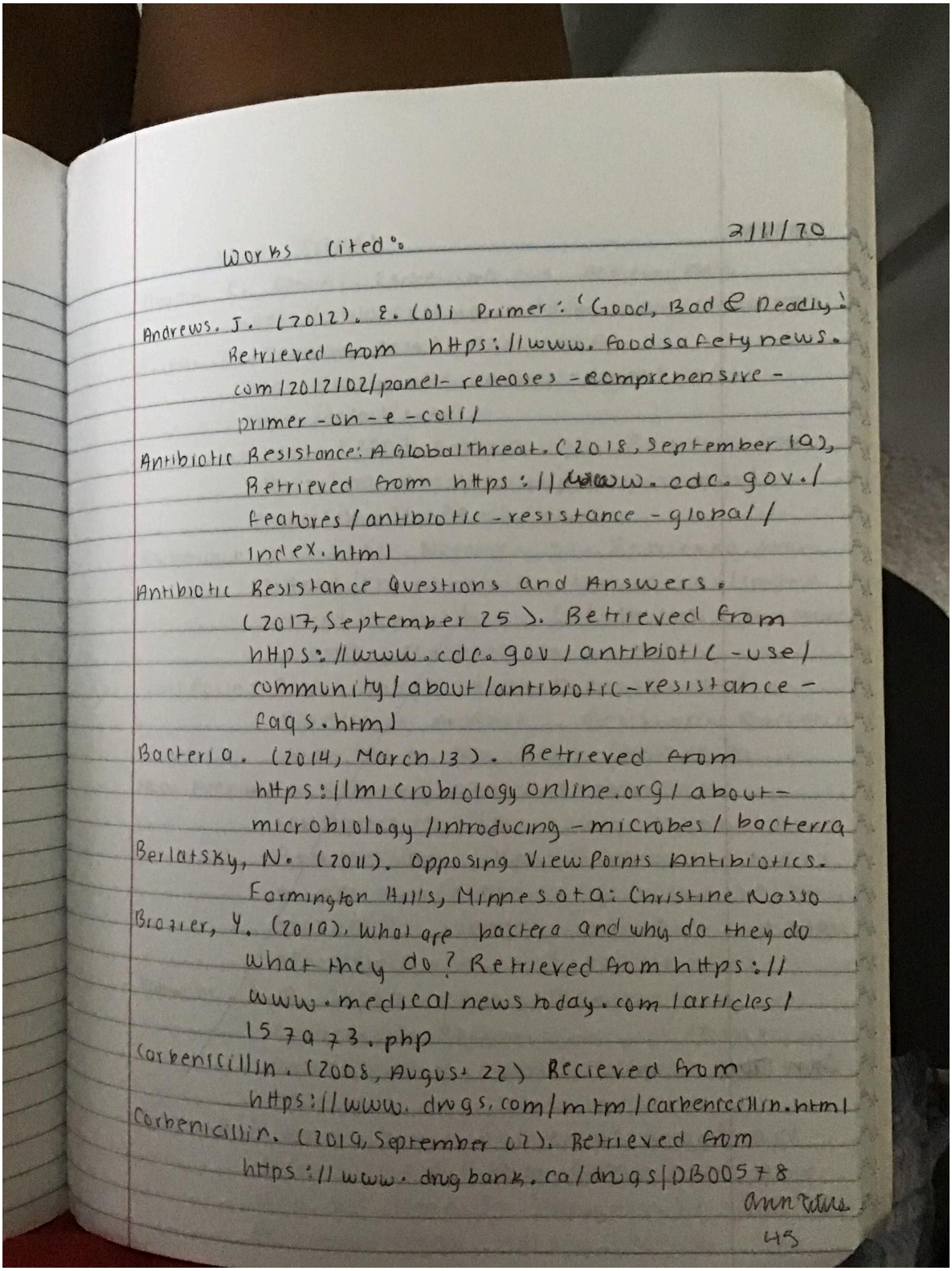


Table 2: Percent Difference in Number of Treated E. coli C
the untreated Control

~~Data Analysis:~~

Experimental Group	Control	5mM Phenylalanine	20mM Ph
1	1	0.866975	0.435
2	1	0.7178218	0.5
3	1	0.2825397	0.222
4	1	0.6411765	0.570
5	1	0.75	0.7173
6	1	0.4356061	0.2
7	1	0.3125	0.18
8	1	1.0176471	0.58
9	1	1.5666667	1.63
10	1	0.4702703	0.3
11	1	0.5757576	0.49
12	1	0.6745283	0.40
13	1	0.7685185	0.6
14	1	0.7314815	0.2
15	1	0.770751	0.34
16	1	0.6349206	0.62

The **Works Cited** page is extremely important, as it ensures that credit is given to the correct individuals, and it should be written in APA format.



Works Cited: 2/11/20

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Annotated

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