Final Experiment Prep Exercise
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Partner Names (first/last):

Hour Date: Why late? Score: + ✓ -

# Directions: use the accompanying reading (see attached) to answer the questions below. Some questions may require you to make decisions as if you were in their position; you will not be able to find all of the answers just be reading the text. If specific information is not included in the reading, use your judgment to complete each question.

# + = complete sentences that are legible and accurate; ✓ = unused space, partial sentences; - = redo the assignment

# Introduction

The authors hypothesized that

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They thought this would occur because

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To test this, they

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# Methods and Materials (use the accompanying reading as well as what you would do/need if you were to complete this experiment to answer the questions below):

They used the following materials for this experiment:

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To conduct this experiment, they used the following methods:

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# Results

Summarize their data using a graph or table:

In this graph/table, you can see that

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These trends indicate that

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In addition to this data, they observed the following:

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# Discussion & Conclusion

They had hypothesized that

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Based on our data and observations, I feel that their hypothesis is: correct incorrect inconclusive

Using as much evidence, data, and detail as you can, explain why you came to this conclusion:

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Do you think their data is conclusive? In other words, do you feel that their experiment is representative of what would happen every time, or do you feel that more research is needed to come to a definite conclusion?

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Explain: \_

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In your opinion, why was this research valuable? Who did it help? Why is this work necessary?

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Where do we go from here? What would be the next logical step in this research? (Should they repeat the same experiment? If not, what questions would additional research address? What questions remain unanswered?)

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**Background**: use this information to complete the accompanying questions. Some information needed for the questions is not included below. If information is not provided, put yourself in their situation and use your own understanding of scientific research to determine how to answer the question. For example, no specific materials are listed below; in order to complete the Methods and Materials section, use your own experience of conducting experiments to determine what Bucky and Wally would need to complete their experiment and record this in the materials portion.

*Bucky and Wally conducted an experiment to determine how caffeine impacts test scores. Bucky and Wally always chug a cola before a test because they think that the caffeine helps them perform better on tests. To test this idea, Bucky and Wally decided to compare the average test scores of students who consumed caffeine compared to those who did not. Bucky and Wally used regular and decaffeinated Coca-Cola for their experiment. They gave the cola to students 15 minutes before the test in 5 oz. Dixie cups. Bucky and Wally used the 8th Grade WKCE standardized test for math; they only used the first 10 questions. Bucky and Wally found 30 students to participate. 15 were given caffeinated cola and 15 were given decaffeinated cola. Their scores are shown below:*

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|   | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| Caf Scores | 80% | 92% | 82% | 97% | 100% | 69% | 78% | 61% | 99% | 87% | 90% | 94% | 92% | 73% | 78% |
| Decaf Scores | 82% | 77% | 91% | 81% | 96% | 100% | 62% | 77% | 42% | 98% | 86% | 89% | 95% | 91% | 72% |

*Bucky and Wally didn’t notice any visible differences in the group that received caffeine compared to those who did not while they were testing. However, one student in the decaffeinated group fell asleep briefly during the test. That student woke up shortly afterwards. Bucky and Wally are not sure if this would skew the data.*

*Bucky and Wally also calculated the standard deviation for their data. The caffeinated group had a standard deviation value of 3% while the decaf group had 4%. (Typically error bars are calculated by using 2 standard error values from the mean – i.e. if 80% were the average and the SE value was 2%, the range of accuracy would be 76-84%. Standard error is found by dividing the standard deviation value by the square root of the total number of measured values; e.g. the caffeinated group’s standard error could be found by calculating 3/√15).*