AP Statistics Final Project Proposal Template **DUE Thursday, May 12th**

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Statistical question: In 4s Ranch, does a Starbucks drink cost more money if it has more caffeine content? Is there an association between money and caffeine content in a Starbucks drink?

Why we selected our topic: We like to go to Starbucks a lot to hang out after school with our friends, and since we spend a lot of time and money there, we were wondering how much caffeine the drinks have, and if we were spending our money right, or if there were certain drinks that had more caffeine but cost less.

Parameter: The average caffeine content in a Starbucks drink in 4s Ranch.

Statistic: The average amount of caffeine content in a Starbucks drink in the sample.

Hypotheses:
Ho: There is no association between caffeine content and price of starbucks drinks
Ha: There is an association between caffeine content and price of starbucks drinks

Experiment or observational study? Why?

Observational study, since we observe the Starbucks drinks that have been ordered at Starbucks coffee shops. We are not doing any random assignment, just random sampling.

Variable(s) that you will measure? If more than one variable, which is explanatory and which is response?

We will measure the cost of the Starbucks drink as well as the caffeine content. The explanatory variable is the caffeine content, and the response variable is the cost of the drink.

Name of test/interval:

Linear Association Test

Data collection (be sure to address both of the questions below):

- **How will you ensure that all conditions are met?**

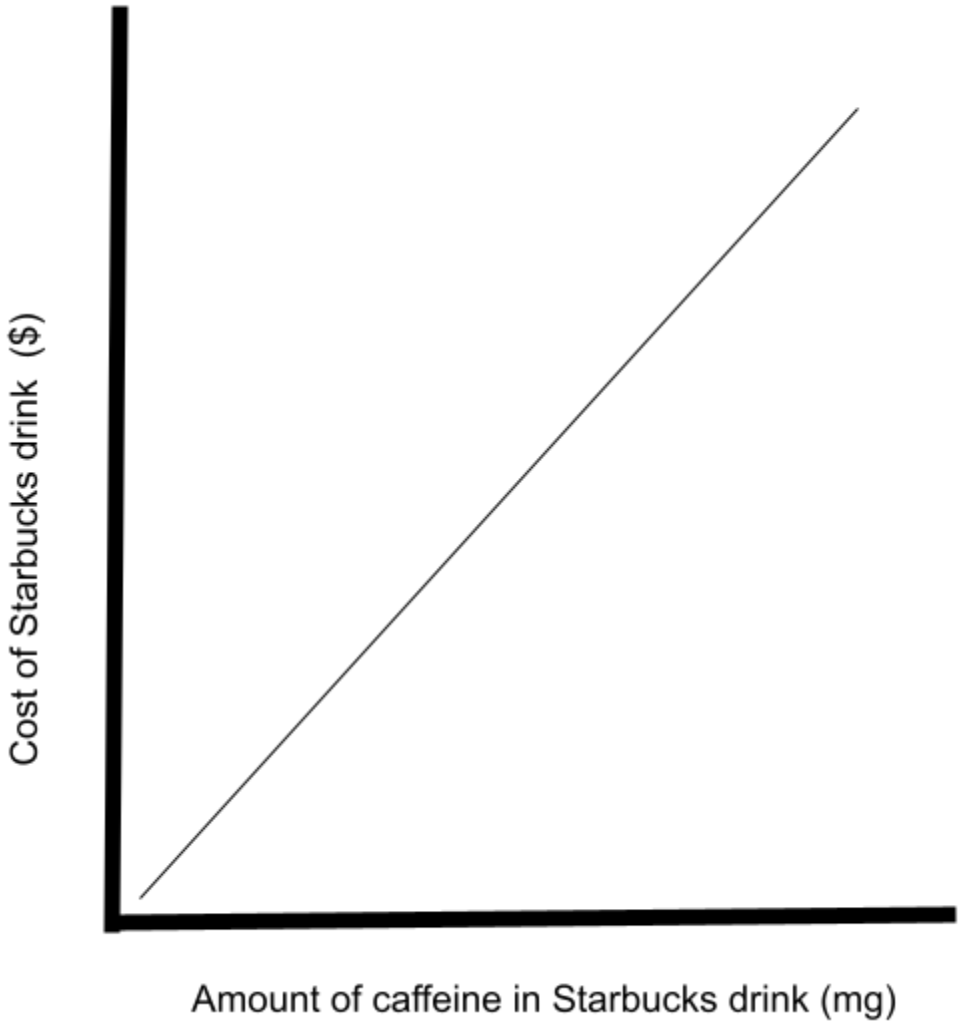
To meet random sampling, we will randomly select drinks from different Starbucks locations. The three locations are the Starbucks in Target, the Starbucks in Del Sur, and the Starbucks at Dove Canyon Road. To meet the independent condition, we know that the caffeine content in one cup of coffee does not affect the caffeine content in another cup of coffee. Similarly the cost of one cup of coffee does not affect the cost of another cup of coffee. To meet the approximately normal distribution condition, we will use the central limit theorem and make sure to sample 30 or more drinks.

- **What steps will you take to reduce bias?**

We will make sure to get costs and sample different locations, since one Starbucks location could be different than another. We will also use random sampling.

Graphs of imaginary data:

- Clear significant answer
- Ambiguous (likely not significant)



Proposal Rubric:	
10	● On first attempt, addresses all questions thoroughly and completely ● Approved on first attempt OR on second with minor alteration / correction
9	● On first attempt, does not correctly or thoroughly address 1-2 of the questions ● Needs very little guidance on addressing original concerns ● Approved on second attempt OR minor correction for third attempt ● Must be approved within one week of first approval
8	● On first attempt, does not correctly or thoroughly address 2-3 of the questions ● Needs some guidance on addressing original concerns ● Approved on at most third attempt ● Must be approved at least a week before project is due
7	● On first attempt, does not correctly or thoroughly address 3-4 of the questions ● Needs guidance on addressing original concerns ● Approved on at most third attempt or minor error on fourth attempt. ● Must be approved at least a week before project is due
6	● On first attempt, lacks sufficient details on or incorrectly answers >4 of questions ● Needs substantial guidance in addressing original concerns ● Approved on at most fourth attempt
5	● On first attempt, lacks sufficient details on or incorrectly answers the majority of the questions ● Needs significant guidance in addressing original concerns ● Approved prior to submitting project
4	● Not approved prior to submitting project