Chapter 9 Project

Instead of a test this chapter, you will complete a project in groups of 2 students. This project will have two parts: an experiment and a survey.

This project will count as the **chapter test**.

Please **type** your answers using **complete sentences**, but you may need to "hand draw" the histogram and insert it as a picture in the document. Number your report exactly like the questions on this paper are numbered.

On the "test day," you will present your project to other student groups or possibly from the front of the classroom.

Part 1: Experiment

1. (2 pts) State a question that you can design a good randomized comparative experiment on. Remember that you have to have two things to compare, the treatment and the control. This question must be only answerable by doing an experiment, not a survey. You will not actually do the experiment. **Have the teacher approve the question**. (Your question must be different from everyone else's and not be controversial.)
2. (5 pts) Describe in detail
   a. Who/what are you going to study? Be very specific.
   b. How will you gather participants and put them in groups?
   c. What is the treatment?
   d. What is the control?
   e. What results do you expect?
3. (2 pts) Describe 2 possible sources of bias that may be introduced.
4. (2 pts) What specifically will you record? (What numbers are you writing down?)
5. (2 pts) Describe one method to determine if the results are statistically significant as given in the book.
6. (2 pts) If it turns out that there is a statistically significant difference between your treatment results and control results, what will you conclude?

Part 2: Survey

7. (1 pts) Create a survey question. The answers must be numerical. **Have the teacher approve the question**. (Your question must be different from everyone else's and not be controversial.)
8. (1 pt) Identify the population.
9. (1 pt) How will you ensure that the sample is unbiased?
10. (1 pt) Write a conjecture about what you think the result will be. This must be done before collecting data (surveying).
11. (2 pts) Ask 50 students the survey question and record their answers. Try to get an unbiased sample by equally representing all groups of people (i.e. grade level, gender, etc.).
12. (1 pt) Organize the data into a table with the data in numeric order.
13. (4 pts) Calculate the measures of central tendency (mean, median, mode) and which is the best representation of the data.
14. (2 pts) Calculate the measures of dispersion (range and standard deviation).
15. (1 pt) Identify any outliers (any point that is more than 3 standard deviations from the mean), if they exist.
16. (2 pts) Calculate the margin of error and explain what it means. (Don't use $\pm \frac{1}{\sqrt{n}}$ because that is for yes/no or select-from-options type surveys. Your book gives another way to find margin of error using standard deviation.)
17. (3 pts) Draw a histogram that uses appropriate intervals.
18. (1 pts) Is the data is normally distributed or skewed? Explain.

Points
Report: 35 pts
Presentation: 5 pts
Total: 40 pts

Sample Survey Questions

1. How many times have you cheated on a test or quiz in high school?
2. How many times do you text message per school day (while in school)?
3. How many hours of sleep do you get on an average school night?
4. How many hours a week do you play video or computer games?
5. How many hours a week do you watch TV?
6. How many hours a week do you spend on school work?
7. Memory Test (Show 15 objects – 45 seconds to list as many as they can)
8. How many times per week do you eat fast food?
9. Memory Test (Read 15 words – 45 seconds to list as many as they can)
10. How much time per week do you spend online?
11. How many hours per week do you spend on social media?
12. How many discipline referrals have you had in high school?
13. Perfect Squares Test—Total they know from 1^2 to 15^2
14. How many times have you been grounded by your parents in the past year?
15. How many states have you been to?
16. How many countries have you been to?
17. Height (in inches)
18. Number of Siblings
19. Number of Pets
20. Number of social media followers
21. Number of hours playing sports or being physically active per week
22. Number of fast food meals you eat in a week
23. Number of hats you own
24. Number of pairs of shoes you own
25. Number of hours spent with friends per week
26. Number of books read in a year
27. Number of pictures on your phone
28. Number of bottles of water you drink per day
29. Number of minutes per day you spend on your cellphone (talking, texting, apps, Internet, etc.)
30. Number of minutes spent in personal or family prayer/devotions per day.