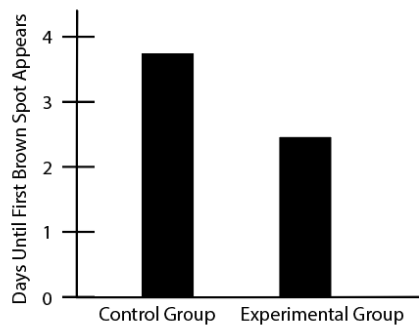


Data Collection and Conclusions Practice

1. The graph below shows the results of an experiment designed to measure the effect of a certain chemical on the rate of ripening of bananas. 400 green bananas were randomly assigned to either the control or the experiment group. In the control group, 200 bananas were placed separately on a shelf without the chemical. In the control group, 200 bananas were placed under identical conditions except each banana was injected with 0.1 grams of the chemical. Based on the results of this experiment, which conclusion is the best? (*no calculator*)



- a. Bananas injected with the chemical were more likely to be more expensive than the bananas left to ripen without a chemical injection.
- b. There is evidence of an association between amount of chemical injection and the size of the bananas.
- c. Bananas left to ripen with an injection were more likely to have a brown spot appear earlier than bananas left to ripen without an injection.
- d. Members of the experiment group were more likely to take longer for a brown spot to appear than members of the control group.
2. A student needs to conduct a survey for her statistics class on the student body's opinion about the length of lunchtime. Which of the following should NOT be a component of this survey? (*no calculator*)
- a. The student collects data from the survey takers.
- b. The student analyzes data from the survey takers.
- c. The student distributes the survey to 100 randomly selected students in her school's student body.
- d. The student distributes the survey to 100 students in her grade.
3. A researcher wants to collect data about the effects of the number of tire threads on the distance it takes for a bike going at 10mph to come to a stop. He hypothesizes that the more tire threads there are, the shorter the distance will be. To test his hypothesis, he randomly assigns 20 identical bikes to be equipped with tires with fewer threads and runs the experiment. He has a second group of 20 randomly assigned identical bikes to be equipped with tires with more threads and runs the experiment under the exact same conditions. Which of the following is the best description of the research design for this study? (*no calculator*)
- a. Controlled experiment
- b. Observational study
- c. Sample survey
- d. None of the above
4. A researcher representing a company wants to measure employee happiness by asking 500 randomly selected employees a series of questions on the subject. Which of the following is the best description of the research design for this study? (*no calculator*)
- a. Observational study
- b. Sample survey
- c. Controlled experiment
- d. None of the above
5. A researcher wants to study how listening to music can affect high school students' cognitive abilities. She randomly divided a group of 80 high schoolers into two groups. For ten minutes, one group listened to upbeat pop music, while the other group did not listen to anything. The researcher then administered standardized tests to determine the immediate effect of the high schooler's previous ten minutes of activity. Which of the following is the best description of this type of research design? (*no calculator*)
- a. An observational study
- b. A controlled experiment
- c. A sample survey
- d. A census

Data Collection and Conclusions Practice

6. In order to determine if a new pill was successful in improving reaction time, a research study was conducted. 500 participants were randomly selected from a large population of people between the ages of 18 and 25. 250 of the participants were randomly assigned to receive the pill, and the other 250 participants did not receive the pill. The resulting data showed that participants who received the pill had improved reaction time as compared to those who did not receive the pill. Based on the design and results of the study, which of the following is an appropriate conclusion? (*no calculator*)
- The pill is likely to improve the reaction time of people between the ages of 18 and 25.
 - The pill improves reaction time better than all other available methods.
 - The pill will likely improve the reaction time of anyone.
 - The pill will cause a substantial improvement in reaction time.
7. A researcher conducted a survey to determine whether people going to the movie theaters preferred to buy popcorn, candy, or nothing. The researcher asked 130 movie-goers at a local movie theater on a Friday night, and 13 people declined to respond. Which of the following factors makes it least likely that a reliable conclusion can be made about the food moviegoers prefer to buy? (*no calculator*)
- Sample size
 - Population size
 - The number of people who refused to respond
 - Where the survey was administered

8. The tables below give the distribution of fastest speeds for a 100m dash for Samuel and Jerry during the same track practice.

Jerry		Samuel	
12.8	13.1	11.8	12.3
13.6	12.7	12.2	13.9
13.1	12.4	14.1	12.7
12.3	12.6	12.7	13.0
12.6	12.7	13.2	12.7
12.9	13.0	12.0	13.8

Which of the following conclusions can be made from the data shown? (*no calculator*)

- The standard deviation of 100m sprint times for Jerry is larger.
 - The standard deviation of 100m sprint times for Samuel is larger.
 - The standard deviation of 100m sprint time is the same for Jerry and Samuel.
 - The standard deviation of 100m sprint times for Jerry and Samuel cannot be calculated with the data provided.
9. A study was done on the weights of different breeds of kittens in a shelter. A random sample of kittens were weighed and recorded to ensure that no kitten was weighed more than once. The sample contained 17 tabby kittens, of which 15% weighed more than 5 pounds. Which of the following conclusions is best supported by the sample data? (*no calculator*)
- The majority of all the kittens at the shelter weigh less than 5 pounds.
 - The average weight of all the kittens at the shelter is approximately 5 pounds.
 - Approximately 15% of all the kittens at the shelter weigh more than 5 pounds.
 - Approximately 15% of all the tabby kittens at the shelter weigh more than 5 pounds.

Data Collection and Conclusions Practice

10. The students of a student body government wanted to assess the opinions of the student body about starting and ending school earlier. The student body government surveyed a sample of 400 students who had morning classes. The survey showed that the majority of those sample were not in favor of the earlier start and end times. Which of the following is true about the student body government's survey? (*no calculator*)
- It shows that the majority of the student body are not in favor of the earlier start and end times.
 - The survey sample should have included more students who had morning classes.
 - The survey sample should have consisted entirely of students who did not have morning classes.
 - The survey sample is biased because it is not representative of the entire student body.