Name _____ Date _____
Mr. Schlansky Algebra II

Surveys

Determining an unbiased, random sample. A *random sample* is one that is selected in a way that gives every different possible sample an equal chance of being chosen. Every member of the population must have the opportunity to be chosen in the sample. The sample should be large enough to represent a good portion of the population.

1. A survey team wants to determine what the favorite foods are of students in a high school. Determine whether the following would be unbiased, random samples. Assume all students have a normal schedule.
   a) Asking every fifth student entering the cafeteria

   b) Asking all fifth period English 9 students

   c) Asking 5 randomly selected students in every physical education class

   d) Asking 20 randomly selected students in all study halls

   e) Asking students whose street address name starts with a vowel

   f) Asking randomly selected students in the culinary club

   g) Asking all students in a randomly selected English 9, English 10, English 11, and English 12 class

   h) Asking every fifth student entering the building in the morning

   i) Asking every fifth student at the Varsity Basketball game

Sample Statistics and Population Characteristics

We refer to summary measures calculated using data from an entire population as *population characteristics.* We refer to summary measures calculated using data from a sample as *sample statistics.* We generalize from a sample to the corresponding population. For example, if 20% of a sample of students drink iced tea, we can conclude that approximately 20% of all students drink iced tea. If the sample is not an unbiased random sample, it can cause the results to be flawed.

2. For the following situations, state whether they are examples of sample statistics or population characteristics. Write an accompanying sentence regarding the population.
   a) A box of Titleist Golf Balls were tested and it was found that 8% of them had imperfections. (Population: Titleist Golf Balls)

   b) Yellowstone National Park's animals are comprised 62% of bison. (Population: Animals in Yellowstone National Park)

   c) In a survey, it was found that 43% of voters voted for candidate A. (Population: People who voted in the election)

   d) 88% of the more than 300 million automobile tires discarded per year are recycled or used for fuel. (Population: Automobile tires discarded per year)

   e) 64% of respondents in a recent poll indicated that residents of Juarez favored building a proposed highway in their town. (Population: Residents of Juarez)

3. Which statement(s) about statistical studies is true?

I. A survey of all English classes in a high school would be a good sample to determine the number of hours students throughout the school spend studying.

II. A survey of all ninth graders in a high school would be a good sample to determine the number of student parking spaces needed at that high school.

III. A survey of all students in one lunch period in a high school would be a good sample to determine the number of hours adults spend on social media websites.

IV. A survey of all Calculus students in a high school would be a good sample to determine the number of students throughout the school who don't like math.

1) I, only 2) II, only 3) I and III 4) III and IV

4. Which survey is *least* likely to contain bias?

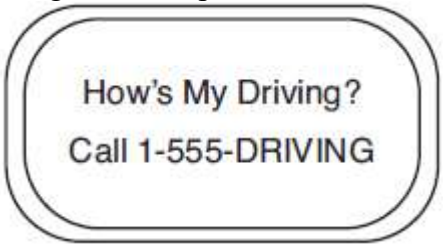
1) surveying a sample of people leaving a movie theater to determine which flavor of ice cream is the most popular
2) surveying the members of a football team to determine the most watched TV sport
3) surveying a sample of people leaving a library to determine the average number of books a person reads in a year
4) surveying a sample of people leaving a gym to determine the average number of hours a person exercises per week

5. A survey is to be conducted in a small upstate village to determine whether or not local residents should fund construction of a skateboard park by raising taxes. Which segment of the population would provide the most unbiased responses?

1) a club of local skateboard enthusiasts
2) senior citizens living on fixed incomes
3) a group opposed to any increase in taxes
4) every tenth person 18 years of age or older walking down Main St.

6. Chuck's Trucking Company has decided to initiate an Employee of the Month program. To determine the recipient, they put the following sign on the back of each truck.

The driver who receives the highest number of positive comments will win the recognition. Explain *one* statistical bias in this data collection method.



7. A survey is being conducted about American's favorite musicians. Which of the following survey methods would most likely produce a random sample?
(1) Asking every 20th person at a Green Day concert
(2) Asking every 10th person at a vintage record store
(3) Asking every 10th person at the Westbury Public Library
(4) Sending out surveys to random households across the country.

8. Which method of collecting data would most likely result in an unbiased random sample?
(1) selecting every third teenager leaving a movie theater to answer a survey about entertainment
(2) placing a survey in a local newspaper to determine how people voted in the 2004 presidential election
(3) selecting students by the last digit of their school ID number to participate in a survey about cafeteria food
(4) surveying honor students taking Trigonometry to determine the average amount of time students in a school spend doing homework each night

9. A survey completed at a large university asked 2,000 students to estimate the average number of hours they spend studying each week. Every tenth student entering the library was surveyed. The data showed that the mean number of hours that students spend studying was 15.7 per week. Which characteristic of the survey could create a bias in the results?
(1) the size of the sample (3) the method of analyzing the data
(2) the size of the population (4) the method of choosing the students who were surveyed

10. The yearbook staff has designed a survey to learn about student opinions on how the yearbook could be improved for this year. If they want to distribute this survey to 100 students and obtain the most reliable data, they should survey
(1) Every third student sent to the office
(2) Every third student to enter the library
(3) Every third student to enter the gym for the basketball game
(4) Every third student arriving at school in the morning

11. You want to determine if students would be interested in joining a new club you would like to start. Describe in detail how you would determine how many students are interested. Include your population, sample, and incorporate your sample statistic and population characteristic.