

1. Bias occurs when certain responses are systematically favored over others.
 - a. Name two poor sampling methods that can lead to bias.
 - b. Name at least two other types of bias that can occur when collecting data.

2. Whole Fruits is a supermarket known for having natural and organic food, often at higher prices than other supermarkets. They recently surveyed a random sample of their customers. Based on the survey results, they claim that 70% of millennials are willing to pay more for high-quality foods.
 - a. Name the type of bias that was present in this survey? Explain.
 - b. Do you think the 70% claim is true? Explain.

3. Gallup is an organization that collects and shares information about public opinion. Kentwood Public Schools partnered with Gallup to create a survey for teachers in the district. The survey was sent out through email to a random sample of 100 teachers, with 56 teachers responding. One of the questions was “How much time do you have for planning each day?”. For the 56 teachers that responded, the average amount of time was 85 minutes.
 - a. Does this scenario describe a voluntary response sample, nonresponse, or both? Explain.
 - b. Do you think the average amount of time for planning for the teachers in the sample is greater than or less than the true average amount of time for planning for all 100 teachers? Explain.
 - c. One of the administrators suggested a larger sample size. Would this reduce the bias? Explain.

4. A new ridesharing company called OoberLift wants to survey their customers about their rideshare experience with the company. Using the app, they send the following request:

Our users have consistently had very positive experiences with OoberLift. We will always continue to strive for perfect 5-star reviews! What is your rating for your experience?

Name two potential sources of bias present in this survey. Explain.

5. A middle school band teacher assigns students to practice their instruments at home for 15 minutes per day. Students are required to keep a “practice log” where they record the number of minutes they practice each day. The teacher selects a random sample of 10 practice logs and finds the average amount of practice per day is 17.8 minutes.

a. Name one potential source of bias present in this survey. Explain.

b. Do you think the average amount of time practicing per day reported by students in the sample is greater than or less than the true average amount of time practicing per day for these students? Explain.

c. Identify a solution that the teacher could implement to remove this bias.

6. A company whose workplace went remote is considering requiring some employees to return to the office at least two days per week. The company holds a mandatory training in which employees could attend virtually or in-person. A company representative selects a random sample of employees who attended the training in-person and asked the following question: "Should the company return to an in-person work environment?" After seeing the results, several employees argue the results of the sample should not be trusted because the results are biased. Which bias is present in the design of the survey?
- A) Nonresponse bias
 - B) Undercoverage bias
 - C) Sampling bias
 - D) Voluntary response bias
7. When designing a sample survey, which of the following is the best way to reduce nonresponse bias?
- A) Make sure the sample size is very large
 - B) Make sure the sample is randomly selected
 - C) Make sure there are multiple ways to contact and follow up with participants in the sample
 - D) Avoid misleading or confusing questions in the survey