

## Practice Problem Set

## ANSWER KEY

Which sample is better for making a prediction? Explain your response.

1. Predict the number of people at a beach who wear sunscreen:

Sample A: Survey 50 people randomly

Sample B: Survey 5 people randomly

**Sample A** is a better sample because it includes more people. Sample B is too small. Sample A will represent the views of the population more accurately.

2. Predict the number of residents in Suffolk County who own a home.

Sample A: Survey 1000 residents randomly on the North Shore of Suffolk County

Sample B: Survey 1000 residents randomly from all parts of Suffolk County

**Sample B** is a better sample because it represents the population fairly. It does not favor one particular location or group of people.

Determine whether the sample is *biased* or *unbiased*. Explain your response.

3. You want to estimate the number of students in your school who want a new football stadium to be built. You survey 20 students at the Friday night football game.

**Biased:** there is a high probability that students who attend football games will favor a new stadium.

4. You want to estimate the number of students in your school who play sports. You survey every 8th person who enters the cafeteria for lunch.

**Unbiased:** it is a random sample that represents the views of the population fairly.

5. A study is conducted to determine whether or not office employees in a law firm have high blood pressure. The participants in the study all shared the same doctor.

**Biased:** if employees share the same doctor, chances are they may suffer from the same ailment. This sample favors a specific group of people (they all have something in common-they share the same doctor).

For each scenario below, determine if the method of sampling was *biased* or *unbiased*, and therefore whether the conclusion made is valid. Explain your response.

6. To evaluate customer satisfaction, a grocery store gives double coupons to anyone who completes a survey as they enter the store. The store manager determines that the customers are very satisfied with their shopping experience in his store.

**Biased:** the customers who completed the survey received double coupons which creates a bias. It is very likely that the customers are satisfied because they just received double coupons which saves them money on groceries. The conclusion made is invalid because the sample is biased.

7. To evaluate the integrity of underground water lines, the department of public works randomly selects 20 sites in the city to unearth and observe water lines. At 5 of the sites, the water lines needed repair. The department of public works concludes about one-fourth of the underground water lines throughout the city need repair.

**Unbiased:** the department randomly selected 5 sites. The conclusion is valid. If water lines at 5 out of the 20 sites randomly selected are in need of repairs, it is reasonable to infer that about one-fourth ( $\frac{5}{20} = \frac{1}{4}$ ) of the water lines need to be repaired.