Study Guide

GOAL
Identify populations and sampling methods.

Vocabulary
A **survey** is a study of one or more characteristics of a group.
The entire group you want information about is called a **population.**
A **sample** is a part of the population.
A **biased sample** is a sample that is not representative of the population.
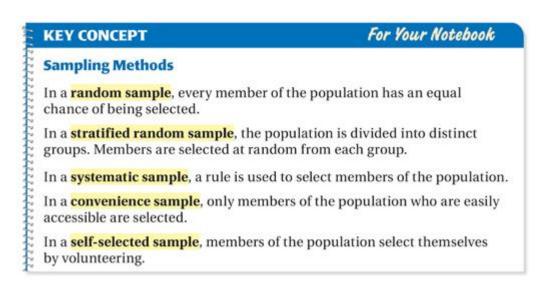A question that encourages a particular response is a **biased question.**

Key Concept

Recognize five different sampling methods and analyze surveys. Recognize biased samples and questions.

Common Student Errors

• Not recognizing potentially biased samples or questions

Tip To reinforce how to identify potentially biased samples or questions, give several examples and then show students how the sample or question could be changed so it's not biased.

Point out that convenience samples often lead to biased surveys because convenience samples consist only of available members of the population.

KEY CONCEPT   *For Your Notebook*

Sampling Methods

In a **random sample**, every member of the population has an equal chance of being selected.

In a **stratified random sample**, the population is divided into distinct groups. Members are selected at random from each group.

In a **systematic sample**, a rule is used to select members of the population.

In a **convenience sample**, only members of the population who are easily accessible are selected.

In a **self-selected sample**, members of the population select themselves by volunteering.

EXAMPLE 1
Classify a sampling method

Library survey A university is conducting a survey to determine whether a public library has hours of business that satisfy most of its patrons. At the library, students question every tenth library patron who exits the library. Identify the population and classify the sampling method.

Solution

The population is library patrons. Because a rule is used to select members of the population (every tenth patron), the sample is a systematic sample.

Exercise for Example 1

1. **What if** ? In Example 1, suppose the university students conduct the survey by asking all patrons checking out books to fill out a form and mail it back to the university. Classify the sampling method.

EXAMPLE 2
Identify potentially biased samples

In Example 1, suppose the university students question 20 library patrons chosen at random on a Monday morning between 9:00 A.M. and 11:00 A.M. Is this method likely to result in a biased sample?

Solution

Because school-age children may be in school and many working adults may be at work, this method may not select an adequate sample of the population. Therefore the result may be a biased sample.

EXAMPLE 3
Identify potentially biased questions

Tell whether the question is potentially biased. *Explain* **your answer. If the question is potentially biased, rewrite it so that it is not.**
   a. Because there is a lack of affordable entertainment for teenagers in the city, do you think the city should sponsor more youth activities?
   b. Do you think the city should risk an increase in taxes by allowing a new elementary school to be built?

Solution

   a. This question is biased because it suggests that there is a lack of affordable activities for teenagers. An unbiased question is "Do you think the city should sponsor more youth activities?"
   b. This question is biased because it encourages a negative response by tying a tax increase to the new elementary school. An unbiased question is "Do you think a new elementary school is necessary?"

Exercise for Examples 2 and 3

   2. Driving Tests In a survey about the need to improve driver safety, 50 randomly selected adults at a senior-citizen resident facility were asked, "Do you think driver safety would improve if drivers were required to pass a driving test every ten years when renewing a driver's license?"
   a. Is the sampling method likely to result in a biased sample? *Explain*.
Is the question potentially biased? *Explain* your answer. If the question is potentially biased, rewrite it so that it is not.