

Sample Sense Check

Spot bias before you trust survey results.

GRADE 8 • 8.PS.2.c

8.PS.2.c "Determine how statistical bias might affect whether the data collected from the sample is representative of the larger population."

NAME _____

DATE _____

CHECK THE SAMPLE

A sample can be biased when it leaves out groups or includes too many people from one group. Compare who was sampled with the whole population. A random method gives each person a chance to be chosen, so it is usually less biased.

WORKED EXAMPLE

A city wants opinions about a new park. It asks 15 people leaving one skate park. Is the sample likely representative?

1. The population is all city residents who may use the park.
2. The sample includes only people at one skate park.
3. Skate-park users may have different opinions from other residents.

Answer: No. The sample has selection bias because skate-park users are overrepresented.

PRACTICE 4 problems

- 1** A principal asks the first 20 students who arrive whether homework should be shorter. What bias may occur?

ANSWER _____

- 2** A counselor randomly chooses 30 names from a list of 600 students. Is this method likely to give a representative sample? Explain.

ANSWER _____

- 3** A poll about chess funding is posted only to followers of the school chess team's account. Which group is overrepresented, and how might this affect the result?

ANSWER _____

- 4** A survey chooses every 25th student from a full alphabetized roster, starting with a randomly chosen number from 1 to 25. Is this method likely biased? Explain.

ANSWER _____

APPLY IT Show your work

- 1** A school has 300 students, including 60 band members. To ask about later buses, a student surveys 24 people at band rehearsal. All 24 are band members, and 18 support later buses. What percent of the survey supports later buses? Explain why this result may not represent the school.

WORK SPACE

ANSWER _____

- 2** Student council wants to estimate interest in an after-school game night. It surveys 20 students near the car-pickup area. Use the table. Find the percent of car riders in the sample and in the school. Then explain the bias.

HOW STUDENTS TRAVEL HOME

Travel group	Students in school	Students surveyed
Bus	120	2
Car	80	15
Walk	40	3
Total	240	20

ANSWER _____

CHALLENGE One step up

A school randomly selects 100 students for a survey about a new lunch menu. Only 40 students respond, and 34 of them favor the menu. Can the school claim that 85% of all students favor the menu? Explain.

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A principal asks the first 20 students who arrive whether homework should be shorter. What bias may occur?	Early-arrival selection bias. Students who arrive early may not represent all students.
2	A counselor randomly chooses 30 names from a list of 600 students. Is this method likely to give a representative sample? Explain.	Yes, it is more likely to be representative because every student has an equal chance of being chosen.
3	A poll about chess funding is posted only to followers of the school chess team's account. Which group is overrepresented, and how might this affect the result?	Chess team followers are overrepresented. The poll may overstate support for chess funding.
4	A survey chooses every 25th student from a full alphabetized roster, starting with a randomly chosen number from 1 to 25. Is this method likely biased? Explain.	It is likely not biased. The random start gives each student an equal chance to be selected.

PART 2 • APPLY IT

- 75% of the survey supports later buses. The sample is 100% band members, but band members are only 20% of the school, so band members are overrepresented. Their opinions may not match the whole school.** Compute $18/24 = 3/4 = 75\%$. Compare $24/24 = 100\%$ band members in the sample with $60/300 = 20\%$ in the population.
- Car riders are $15/20 = 75\%$ of the sample and $80/240 = 1/3$, or $33\frac{1}{3}\%$, of the school. Car riders are overrepresented, so the survey may not represent the whole school.** Divide the car-rider count by each total. Sampling near car pickup includes far more car riders than the population does.

CHALLENGE

No. Although the 100 students were randomly selected, only 40% responded. The 60 students who did not respond may have different opinions, causing nonresponse bias. The 85% result describes the respondents, not necessarily all students.

Accept equivalent fractions, decimals, and percentages. Accept explanations that correctly identify selection bias, overrepresentation, or nonresponse bias and connect it to an unrepresentative sample.