

Sample Smart

Use fair samples to make useful estimates.

GRADE 6 • NY-6.SP.1.b

NY-6.SP.1.b "Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population."

NAME _____

DATE _____

THE BIG IDEA

A population is the whole group you want to learn about. A sample is part of that group. A sample can support a claim about the population when it is chosen fairly and includes different kinds of people in the group.

WORKED EXAMPLE

The array shows 15 recreation-center members. Five shaded cards are a random sample. Four sampled members want a skate park. Estimate how many of all 15 members may want one.



1. The sample shows 4 out of 5 members.
2. Each sampled member represents $15 / 5 = 3$ members.
3. Multiply $4 \times 3 = 12$.

Answer: About 12 members may want a skate park.

PRACTICE 4 problems

- 1** A music teacher randomly surveys 20 of 100 students. Seven want a talent show. Estimate how many students want a talent show. Is the sample likely representative?

ANSWER _____

- 2** A survey asks the first 18 students who enter school whether they want longer recess. Is this sample representative of the whole school? Explain.

ANSWER _____

- 3** A school randomly chooses 10% of students from every grade to answer a survey. Is this sample likely representative of the school? Explain.

ANSWER _____

- 4** To learn about movie choices, Ava polls 16 friends from her drama club. Can she generalize to all sixth graders? Why?

ANSWER _____

APPLY IT Show your work

- 1** The school plans a game afternoon for 270 students. A random sample of 45 students chooses a favorite activity. Thirty choose board games. About how many students may choose board games? Why is this estimate reasonable?

WORK SPACE

ANSWER _____

- 2** Student council wants to know whether students would use an after-school study lounge. It surveys 32 students who already stay after school for tutoring, and 25 say yes. Can council claim that most of 400 students would use the lounge? Explain.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A school wants to estimate how many of 600 students favor a later school start. Sample A asks 48 esports club members, and 36 favor it. Sample B randomly selects 30 students from the school, and 18 favor it. Which sample gives a better estimate? Use that sample to estimate the number of students who favor a later start. Explain.

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A music teacher randomly surveys 20 of 100 students. Seven want a talent show. Estimate how many students want a talent show. Is the sample likely representative?	35 students; yes, likely, because the students were chosen randomly.
2	A survey asks the first 18 students who enter school whether they want longer recess. Is this sample representative of the whole school? Explain.	No. Students who arrive first may not represent all students.
3	A school randomly chooses 10% of students from every grade to answer a survey. Is this sample likely representative of the school? Explain.	Yes, likely. Students are chosen randomly from every grade in the same proportion.
4	To learn about movie choices, Ava polls 16 friends from her drama club. Can she generalize to all sixth graders? Why?	No. Her friends from drama club may have different movie choices than all sixth graders.

PART 2 • APPLY IT

- About 180 students may choose board games. The estimate is reasonable because the sample was random.** $30 / 45 = 2 / 3$. Then $2 / 3$ of 270 is 180.
- No. Students who already stay after school for tutoring are more likely than other students to use the lounge, so the sample is not representative.** The sample leaves out many students who do not already stay after school. Its result should not be generalized to all 400 students.

CHALLENGE

Sample B gives a better estimate because it is randomly selected from the whole school. Since $18 / 30 = 3 / 5$, about 360 students favor a later start. Sample A may be biased because esports club members may not represent all students.

Accept equivalent estimates and clear explanations that identify random selection and coverage of the population. Random samples are likely representative, but students may note that a sample cannot guarantee a perfect match to the population.