

Sample Signal

Use sample results to estimate and judge conclusions.

HIGH SCHOOL • HSS-IC.B

CCSS.Math.Content.HSS-IC.B "Make inferences and justify conclusions from sample surveys, experiments, and observational studies"

NAME _____

DATE _____

FROM SAMPLE TO POPULATION

A random sample can represent a larger population. Find the sample proportion, multiply by the population size, and report the result as an estimate, not an exact count.

WORKED EXAMPLE

In a random sample, 18 of 30 students choose bus service. Estimate how many of 450 students choose it.

1. Sample proportion = $18/30 = 3/5$.
2. Set $x/450 = 3/5$.
3. $x = 270$.

Answer: About 270 students.

PRACTICE 5 problems

- 1** A random survey finds that 14 of 28 students use the library after school. Estimate how many of 360 students use it.

ANSWER _____

- 2** In a random sample, 21 of 35 students follow the school sports account. Estimate the number out of 240 students.

ANSWER _____

- 3** A random sample shows that 16 of 40 students bring lunch from home. Estimate the number out of 500 students.

ANSWER _____

- 4** In a random sample, 27 of 45 students want more bike racks. Estimate the number out of 700 students.

ANSWER _____

- 5** A random sample finds that 26 of 52 students play on a school team. Estimate the number out of 650 students.

ANSWER _____

APPLY IT Show your work

- 1** A random survey of 48 seniors finds that 24 want a later school start. The school has 960 seniors. Estimate how many seniors want a later start.

WORK SPACE

ANSWER _____

- 2** In a study-skills experiment, 35 students were randomly assigned to use a planner app, and 14 completed every assignment. Of 22 students randomly assigned to no app, 11 completed every assignment. What is the percentage-point difference? What conclusion is justified?

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

An online poll linked on a gaming channel gets 72 yes responses from 90 respondents to a question about a later school start. Find the yes rate. Can this poll estimate the opinion of the whole school? Explain.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A random survey finds that 14 of 28 students use the library after school. Estimate how many of 360 students use it.	About 180 students.
2	In a random sample, 21 of 35 students follow the school sports account. Estimate the number out of 240 students.	About 144 students.
3	A random sample shows that 16 of 40 students bring lunch from home. Estimate the number out of 500 students.	About 200 students.
4	In a random sample, 27 of 45 students want more bike racks. Estimate the number out of 700 students.	About 420 students.
5	A random sample finds that 26 of 52 students play on a school team. Estimate the number out of 650 students.	About 325 students.

PART 2 • APPLY IT

1. **About 480 seniors.** The sample proportion is $24/48$, or $1/2$. One-half of 960 is 480.
2. **The no-app group was higher by 10 percentage points, 50% versus 40%. Random assignment supports a causal comparison for these participants, but not a claim about all students.** The planner-app rate is $14/35 = 40\%$, and the no-app rate is $11/22 = 50\%$. Subtract to get 10 percentage points.

CHALLENGE

The yes rate is 80%. No, the respondents volunteered from a gaming channel, so the sample may not represent the whole school.

Accept equivalent fraction, decimal, or percent work and reasonable wording such as "about" for estimates. For the experiment, accept a causal conclusion limited to the participants and reject a claim that it proves the result for all students.