LESSON MAKER PRO

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

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.

WORK SPACE AND ANSWER

Sample Signal

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 permits investigation of a causal effect, but this observed difference alone does not establish one: chance assignment may produce a difference. Assess uncertainty, for example with a randomization simulation, before concluding that the app caused a change. The participants also were not described as a random sample of 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 and percent work. In the experiment, require the 10-percentage-point observed difference, possible chance variation, and the distinction between random assignment and population sampling. Do not accept the observed difference alone as proof of a causal effect.