

Survey Smart

Choose samples and make careful estimates.

HIGH SCHOOL • MA.912.DP.5

MA.912.DP.5 "Determine methods of data collection and make inferences from collected data."

NAME _____

DATE _____

FROM SAMPLE TO INFERENCE

Use a random sample so each person in the population has a fair chance to be chosen. Find the sample proportion, then use that proportion to estimate the whole population.

WORKED EXAMPLE

A random sample of 24 students finds that 18 prefer a later start time. Estimate how many of 180 students may prefer it.

1. Sample proportion = $18/24 = 3/4$.
2. Estimate = $3/4$ of 180.
3. $180 / 4 = 45$, and $45 \times 3 = 135$.

Answer: About 135 students

PRACTICE 5 problems

- 1** Name a random method for choosing 16 students from a school.

ANSWER _____

- 2** A survey asks only basketball players about school lunches. What is the problem?

ANSWER _____

- 3** In a random sample, 14 of 35 students use the tutoring center. Estimate how many of 210 students use it.

ANSWER _____

- 4** A principal randomly surveys 27 seniors about graduation plans. What is the population?

ANSWER _____

- 5** A random sample shows that 28 of 70 students want a new club. Estimate how many of 215 students may want it.

ANSWER _____

APPLY IT Show your work

- 1** A student media team randomly selects 32 students from a school of 320. Of those students, 20 say they would watch an esports tournament. Estimate how many students would watch.

WORK SPACE

ANSWER _____

- 2** A club posts an online poll, and 63 of 75 respondents want a gaming event. Can the club claim that 84% of all students want the event? Name a better collection method.

WORK SPACE

ANSWER _____

CHALLENGE One step up

CHALLENGE

Two groups report that 60% of students support a school dance. Group A randomly selected 60 students, and 36 supported it. Group B asked 135 students who chose to answer online, and 81 supported it. Which result should the school use to infer support among all students? Explain.

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	Name a random method for choosing 16 students from a school.	List all student IDs and randomly choose 16 IDs.
2	A survey asks only basketball players about school lunches. What is the problem?	Selection bias, because basketball players may not represent all students.
3	In a random sample, 14 of 35 students use the tutoring center. Estimate how many of 210 students use it.	84 students
4	A principal randomly surveys 27 seniors about graduation plans. What is the population?	All seniors at the school
5	A random sample shows that 28 of 70 students want a new club. Estimate how many of 215 students may want it.	About 86 students

PART 2 • APPLY IT

1. **About 200 students** The sample proportion is $20/32 = 5/8$. Then $5/8$ of 320 is 200.
2. **No. The poll is voluntary, so it may be biased. Randomly select students from the school roster.** Although $63/75 = 84\%$, voluntary respondents may not represent the whole school. A random sample would support a stronger inference.

CHALLENGE

Use Group A. Both samples show 60%, but Group A used a random sample, while Group B used a voluntary sample that may be biased.

Accept equivalent proportion work and estimates labeled as approximate. For sampling-method responses, accept any method that randomly selects from a complete list of students.