

Sample to Whole

Use a random sample to estimate a population.

GRADE 7 • TEKS 7.6.F

7.6.F "use data from a random sample to make inferences about a population;"

NAME _____

DATE _____

FROM SAMPLE TO POPULATION

A random sample can help you estimate what is true for a whole population. Find the fraction in the sample, then multiply that fraction by the population size. Use the word about because an estimate may not be exact.

WORKED EXAMPLE

In a random sample of 30 students, 18 bring a reusable water bottle. Estimate how many of 450 students bring one.

1. Write the sample fraction: $18/30 = 3/5$.
2. Multiply the population by the sample fraction: $450 \times 3/5$.
3. $450 / 5 = 90$, and $90 \times 3 = 270$.

Answer: About 270 students bring a reusable water bottle.

PRACTICE 6 problems

- 1** A random sample of 20 students finds that 12 students prefer basketball at recess. Estimate how many of 200 students prefer basketball at recess.

ANSWER _____

- 2** In a random sample of 15 students, 9 students say they walk to school. Estimate how many of 80 students walk to school.

ANSWER _____

- 3** A random sample of 25 library books shows that 8 are graphic novels. Estimate how many of 300 library books are graphic novels.

ANSWER _____

- 4** In a random sample of 35 students, 14 students pack lunch from home. Estimate how many of 500 students pack lunch from home.

ANSWER _____

- 5** A random sample of 22 students finds that 11 students play an instrument. Estimate how many of 260 students play an instrument.

ANSWER _____

- 6** In a random sample of 40 students, 16 students choose tacos as their favorite cafeteria lunch. Estimate how many of 400 students choose tacos.

ANSWER _____

APPLY IT Show your work

- 1** The student council is planning a game night. In a random sample of 24 club members, 15 say they would attend. The club has 120 members. About how many members would be expected to attend?

WORK SPACE

ANSWER _____

- 2** A school library wants to order more graphic novels. In a random sample of 32 students, 12 students say they would read more graphic novels. The school has 320 students. About how many students would read more graphic novels?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Two random samples are used to estimate how many of 600 students would join an after-school art club. Sample A has 20 interested students out of 50. Sample B has 17 interested students out of 40. Find each estimate. Then explain why the estimates are different even though both samples are random.

WORK SPACE AND ANSWER

PART 1 • PRACTICE

#	PROBLEM	ANSWER
1	A random sample of 20 students finds that 12 students prefer basketball at recess. Estimate how many of 200 students prefer basketball at recess.	About 120 students
2	In a random sample of 15 students, 9 students say they walk to school. Estimate how many of 80 students walk to school.	About 48 students
3	A random sample of 25 library books shows that 8 are graphic novels. Estimate how many of 300 library books are graphic novels.	About 96 books
4	In a random sample of 35 students, 14 students pack lunch from home. Estimate how many of 500 students pack lunch from home.	About 200 students
5	A random sample of 22 students finds that 11 students play an instrument. Estimate how many of 260 students play an instrument.	About 130 students
6	In a random sample of 40 students, 16 students choose tacos as their favorite cafeteria lunch. Estimate how many of 400 students choose tacos.	About 160 students

PART 2 • APPLY IT

1. **About 75 members** Use the sample fraction $\frac{15}{24}$, which simplifies to $\frac{5}{8}$. Multiply $120 \times \frac{5}{8}$ to get 75.
2. **About 120 students** Use the sample fraction $\frac{12}{32}$, which simplifies to $\frac{3}{8}$. Multiply $320 \times \frac{3}{8}$ to get 120.

CHALLENGE

Sample A estimates about 240 students. Sample B estimates about 255 students. The estimates differ because different random samples can have different sample proportions.

Accept equivalent fraction work and estimates stated with or without the word about. For the challenge, accept an explanation that random samples can vary, causing different estimates.