LESSON MAKER PRO

From Sample to Study

Use study results to make careful conclusions.

HIGH SCHOOL · MM.D3D.C

MM.D3D.C "Statistical studies allow a conclusion to be drawn about a population that is too large to survey completely or about cause and effect in an experiment."

NAME _____ DATE _____

THE BIG IDEA

To estimate a population count from a random sample, divide the number with a trait by the sample size, then multiply by the population size. The result is an estimate, not an exact count. In an experiment, comparing randomly assigned groups can help show cause and effect.

WORKED EXAMPLE

A school has 1,500 students. Use the random sample in the table to estimate how many want a new lunch menu.

LUNCH MENU SURVEY

Surveyed	Want new menu
60	18

1. Find the sample fraction: 18/60 = 3/10.
2. Estimate the count: 3/10 * 1,500 = 450.

Answer: About 450 students.

PRACTICE 4 problems

1 Of 50 randomly sampled fans, 20 prefer a new team logo. Estimate how many of 800 fans prefer it.

ANSWER _____

2 In a random sample of 24 library members, 8 use audiobooks. Estimate how many of the 600 members use them.

ANSWER _____

3 Of 80 randomly sampled commuters, 12 bike to work. Estimate how many of 1,000 commuters bike to work.

ANSWER _____

4 Of 90 randomly sampled students, 54 support a music club. Estimate how many of 700 students support it.

ANSWER _____

APPLY IT Show your work

1 A school randomly surveys 48 students. Of those, 30 want a later start time. Estimate how many of the school's 960 students want a later start.

WORK SPACE

ANSWER _____

2 Students were randomly assigned to phone settings for a 20-minute study block. The table shows who finished without checking a phone. How many percentage points higher was the finish rate with notifications blocked? Can this experiment support a cause-and-effect conclusion?

STUDY BLOCK RESULTS

Setting	Finished	Total
Blocked	34	50
Usual	22	50

ANSWER _____

CHALLENGE One step up

A district draws two random groups of different students from its 1,800 students. In one group, 12 of 30 favor a four-day school week. In the other, 48 of 70 favor it. Use both groups to estimate how many district students favor it. Why should you not simply average the two group percentages?

WORK SPACE AND ANSWER

From Sample to Study

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Of 50 randomly sampled fans, 20 prefer a new team logo. Estimate how many of 800 fans prefer it.	**About 320 fans.**
2	In a random sample of 24 library members, 8 use audiobooks. Estimate how many of the 600 members use them.	**About 200 members.**
3	Of 80 randomly sampled commuters, 12 bike to work. Estimate how many of 1,000 commuters bike to work.	**About 150 commuters.**
4	Of 90 randomly sampled students, 54 support a music club. Estimate how many of 700 students support it.	**About 420 students.**

PART 2 · APPLY IT

1. **About 600 students.** 30/48 = 5/8, and 5/8 * 960 = 600.
2. **24 percentage points higher. Yes, random assignment supports a cause-and-effect conclusion for these students.** The finish rates are 34/50 = 68% and 22/50 = 44%, a difference of 24 percentage points. Random assignment makes the settings a valid basis for a causal comparison.

CHALLENGE

About 1,080 students. Together, 60 of 100 sampled students favor it, so 60/100 * 1,800 = 1,080. A simple average of the group percentages would give equal weight to groups of different sizes.

Accept equivalent calculations and estimates labeled as approximate. For the experiment, accept a causal conclusion about the students studied, not a claim about all students.