LESSON MAKER PRO

Who Got Heard?

Use survey numbers to judge whose views are represented.

HIGH SCHOOL · MT.PLUS.DATA.DES.2.b

MT.PLUS.DATA.DES.2.b "Describe differences between randomly selecting samples and randomly assigning subjects to experimental treatment groups in terms of inferences drawn regarding a population versus regarding cause and effect by: Evaluating where bias..."

NAME _____ DATE _____

COMPARE THE SHARES

Compare each group's share of the population with its share of the replies. If groups have different views, replies from an overrepresented group can pull the survey result toward that group's view. Random selection can support claims about a population when replies are representative, while random assignment can support cause-and-effect claims.

WORKED EXAMPLE

A school surveys students about a new lunch option. Would the yes rate among replies likely overstate or understate schoolwide support?

LUNCH SURVEY

Grade	Students	Replies	Yes
Juniors	80	8	6
Seniors	20	12	3

1. Juniors are 80/100 = 80% of students but 8/20 = 40% of replies.
2. Juniors' yes rate is 6/8 = 75%; seniors' is 3/12 = 25%.
3. The group with more support is underrepresented in the replies.

Answer: The yes rate among replies likely understates schoolwide support.

PRACTICE 4 problems

1 A school has 50 freshmen and 50 sophomores. Replies come from 10 freshmen and 40 sophomores. What percent of replies are from freshmen? Are freshmen underrepresented?

ANSWER _____

2 A random sample of 100 teens gets a survey. Only 75 reply. What percent did not reply? Name the bias that could occur if their views differ.

ANSWER _____

3 A poll asks only students entering the gym about sports funding. Of 25 polled, 15 favor it. What percent favor it? Why might this not reflect all students?

ANSWER _____

4 A school randomly selects 40 students. Of the 30 who reply, 24 favor a later start. What percent of replies favor it? Does this show that a later start causes higher grades?

ANSWER _____

APPLY IT Show your work

1 A school polls students about paying for a club app. Compare the freshman share of students with the freshman share of replies. Would the yes rate among replies likely overstate or understate schoolwide support?

CLUB APP POLL

Grade	Students	Replies	Yes
Freshmen	100	10	2
Seniors	50	30	18

ANSWER _____

2 A music app randomly invites 120 students to rate a playlist. Of the 90 who reply, 63 like it. Find the reply rate and the like rate among replies. Can the app conclude that this rate holds for all students or that the playlist caused better moods?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Assume replies reflect views within each grade. Find the overall yes rate among replies. Then estimate schoolwide support by weighting each grade's yes rate by its share of students. Which rate is higher, and why?

SCHOOL EVENT POLL

Grade	Students	Replies	Yes
Lower grades	150	10	2
Upper grades	50	30	24

WORK SPACE AND ANSWER

ANSWER KEY # Who Got Heard?

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A school has 50 freshmen and 50 sophomores. Replies come from 10 freshmen and 40 sophomores. What percent of replies are from freshmen? Are freshmen underrepresented?	**10/50 = 20%. Yes. Freshmen are 50% of the school but 20% of replies.**
2	A random sample of 100 teens gets a survey. Only 75 reply. What percent did not reply? Name the bias that could occur if their views differ.	**25% did not reply. Nonresponse bias could occur.**
3	A poll asks only students entering the gym about sports funding. Of 25 polled, 15 favor it. What percent favor it? Why might this not reflect all students?	**15/25 = 60%. Sampling bias is possible because students entering the gym may differ from other students.**
4	A school randomly selects 40 students. Of the 30 who reply, 24 favor a later start. What percent of replies favor it? Does this show that a later start causes higher grades?	**24/30 = 80%. No. A survey of opinions cannot establish a cause-and-effect claim about grades.**

PART 2 · APPLY IT

1. **Freshmen are 100/150 = 2/3 of students but 10/40 = 1/4 of replies. The yes rate among replies likely overstates schoolwide support.** Freshmen favor the app at a rate of 2/10 = 20%, compared with 18/30 = 60% for seniors. Replies underrepresent the group with less support.
2. **The reply rate is 90/120 = 75%, and the like rate is 63/90 = 70%. Neither claim is justified.** Nonresponders might have different views, so the replies may not represent all students. No experiment tested whether the playlist caused a change in mood.

CHALLENGE

The yes rate among replies is (2 + 24)/(10 + 30) = 65%. The weighted estimate is (150/200)(2/10) + (50/200)(24/30) = 35%. The reply rate is higher because the upper grades, which have more support, are overrepresented in replies.

Accept equivalent fractions or percentages. An imbalance suggests possible bias, but it does not prove that every student's view within a group is the same.