LESSON MAKER PRO

Who Answered?

Use survey numbers to spot possible nonresponse bias.

HIGH SCHOOL · A2S.DSP.G

A2S.DSP.G "Bias, such as sampling, response, or nonresponse bias, may occur in surveys, yielding results that are not representative of the population of interest."

NAME _____ DATE _____

LOOK BEYOND THE REPLIES

Response rate = number who reply / number invited. If many people do not reply, the opinions of respondents may not represent everyone invited.

WORKED EXAMPLE

A school surveys students about a later start time. What fraction replied, and what percent of respondents said yes? Can you tell what percent of all invited students favor the change?

LATER START SURVEY

Invited	Replied	Replied yes
72	48	36

1. Response rate: 48/72 = 2/3.
2. Respondents who said yes: 36/48 = 3/4 = 75%.
3. The opinions of students who did not reply are unknown.

Answer: 2/3 replied, and 75% of respondents said yes. The percent of all invited students who favor the change is unknown.

PRACTICE 4 problems

1 A club invites 40 members to answer a survey. If 20 reply, what is the response rate?

ANSWER _____

2 Of 30 survey respondents, 12 favor a new school logo. What percent of respondents favor it?

ANSWER _____

3 A survey invites 56 students, and 14 reply. How many do not reply?

ANSWER _____

4 Of 28 students invited, 14 reply and 7 support a plan. Can you conclude that half of all 28 support it? Explain.

ANSWER _____

APPLY IT Show your work

1 A school asks students about secure bike parking. Which group is underrepresented among replies? Compare its share of invitations with its share of replies.

BIKE PARKING SURVEY

Group	Invited	Replied
Bike riders	84	14
Bus riders	28	14

ANSWER _____

2 A student council asks 60 students about a game night. Only 20 reply, and 15 of them favor it. What are the smallest and largest possible fractions of all invited students who favor it?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Of 80 ninth graders, 8 reply to a lunch survey and 6 favor a new menu. Of 20 twelfth graders, 12 reply and 6 favor it. Find the percent favoring it among all respondents. Then estimate the percent favoring it among all invited students if each grade's respondents represent that grade. Why do the percentages differ?

WORK SPACE AND ANSWER

Who Answered?

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A club invites 40 members to answer a survey. If 20 reply, what is the response rate?	**20/40 = 50%**
2	Of 30 survey respondents, 12 favor a new school logo. What percent of respondents favor it?	**12/30 = 40%**
3	A survey invites 56 students, and 14 reply. How many do not reply?	**42 students**
4	Of 28 students invited, 14 reply and 7 support a plan. Can you conclude that half of all 28 support it? Explain.	**No. Half of the respondents support it, but the 14 students who did not reply may have different opinions.**

PART 2 · APPLY IT

1. **Bike riders. They received 84/112 = 3/4 of invitations but gave 14/28 = 1/2 of replies.** Add each column, then compare the bike riders' share of invitations with their share of replies.
2. **Smallest: 15/60 = 1/4. Largest: 55/60 = 11/12.** For the smallest fraction, count none of the 40 nonrespondents as supporters. For the largest, count all 40 as supporters.

CHALLENGE

Among respondents, 12/20 = 60% favor it. By grade, 6/8 = 75% and 6/12 = 50%; the estimate is (80 × 75% + 20 × 50%)/100 = 70%. The ninth graders favor it more but make up a smaller share of respondents than of invited students.

Accept equivalent fractions or percentages. The challenge's 70% is an estimate that depends on respondents representing others in their own grade.