LESSON MAKER PRO

Trust the Data?

Use rates and study design to test a claim.

HIGH SCHOOL · S.IR.3.1

S.IR.3.1 "Evaluate strengths and weaknesses in the studies or methods used to generate data."

NAME _____ DATE _____

COMPARE, THEN QUESTION

A study's result is more useful when you know how people were selected and how many took part. Find a rate by dividing the number with a result by the number in that group. Then ask whether the method could have left out people with different views or outcomes.

WORKED EXAMPLE

A school randomly selects 25 students for a survey. Of those, 14 reply. Find the response rate, then name one strength and one weakness of the method.

1. Divide the number who replied by the number selected: 14/25 = 0.56.
2. Convert to a percent: 0.56 = 56%.
3. Random selection is a strength. The 11 students who did not reply may have different views.

Answer: The response rate is 56%. Random selection is a strength, but nonresponse is a weakness.

PRACTICE 6 problems

1 A school randomly selects 40 students for a survey, and 32 reply. What percent did not reply? Explain why that matters when judging the results.

ANSWER _____

2 At a club booth, 18 of 45 visitors say they want longer meetings. What percent favor longer meetings? Why might this result not represent all students?

ANSWER _____

3 Students are randomly assigned to try a focus tool or not use it. Use the table to find the difference in the groups' on-time completion rates, in percentage points. Why is random assignment a strength?

ASSIGNMENT COMPLETION

Group	Finished on time	Students
Focus tool	16	50
No tool	8	50

ANSWER _____

4 Students choose whether to study with music. Use the table to find each group's pass rate. Do these results show a higher pass rate for the music group? Name one weakness of the study.

STUDY HABITS AND TEST RESULTS

Group	Passed	Students
Music	18	60
No music	9	30

ANSWER _____

5 A school asks students using its hall-pass app whether they prefer digital passes. Of 75 replies, 45 say yes. What percent say yes? Explain one weakness in using this result to describe all students.

ANSWER _____

6 Two surveys ask whether students want a later start time. Which gives better evidence about all students? Use the table to give a numerical reason and a method reason.

START-TIME SURVEYS

Survey	How students were invited	Replies	Invited
A	Random selection	42	60
B	QR code on social media	24	60

ANSWER _____

APPLY IT Show your work

1 Students who order lunch through a school app can rate a proposed menu. Of 80 students who respond, 48 approve it. Find the approval rate. Can the school use this result to claim that most students approve? Explain.

WORK SPACE

ANSWER _____

2 A teacher randomly assigns students to use a study planner or their usual study method. Use the table to compare the groups' quiz improvement rates in percentage points. State one strength of the study and one limit on its conclusion.

QUIZ IMPROVEMENT

Group	Improved	Students
Study planner	22	55
Usual method	11	55

ANSWER _____

CHALLENGE One step up

A school randomly selects 50 students to ask about a new schedule. Only 30 reply, and 21 of those favor it. A headline says, "Most selected students favor the schedule." Find the percent of respondents who favor it. Then find the smallest and largest possible percentages of all selected students who favor it. Is the headline certain to be true? Explain.

WORK SPACE AND ANSWER

ANSWER KEY

Trust the Data?

HIGH SCHOOL · S.IR.3.1

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A school randomly selects 40 students for a survey, and 32 reply. What percent did not reply? Explain why that matters when judging the results.	**20% did not reply. Their views may differ from the views of students who replied.**
2	At a club booth, 18 of 45 visitors say they want longer meetings. What percent favor longer meetings? Why might this result not represent all students?	**40% favor longer meetings. Booth visitors are a convenience sample and may not represent all students.**
3	Students are randomly assigned to try a focus tool or not use it. Use the table to find the difference in the groups' on-time completion rates, in percentage points. Why is random assignment a strength?	**The rates are 32% and 16%, a difference of 16 percentage points. Random assignment helps make the groups comparable.**
4	Students choose whether to study with music. Use the table to find each group's pass rate. Do these results show a higher pass rate for the music group? Name one weakness of the study.	**Both groups have a 30% pass rate, so the music group does not have a higher rate. Students chose their own groups, which could make the groups different in other ways.**
5	A school asks students using its hall-pass app whether they prefer digital passes. Of 75 replies, 45 say yes. What percent say yes? Explain one weakness in using this result to describe all students.	**60% say yes. Students who do not use the app were left out.**
6	Two surveys ask whether students want a later start time. Which gives better evidence about all students? Use the table to give a numerical reason and a method reason.	**Survey A gives better evidence. Its response rate is 70%, compared with 40% for B, and it invited randomly selected students rather than relying on volunteers.**

PART 2 · APPLY IT

1. **The approval rate is 60% among respondents. No, the school cannot conclude that most students approve because the survey excludes students who do not use the lunch app, and those who responded may differ from those who did not.** Compute 48/80 = 60%. The sampling method and possible nonresponse limit the claim about all students.
2. **The rates are 40% and 20%, so the difference is 20 percentage points. Random assignment is a strength, but results from one teacher's students may not apply to students elsewhere.** Compute 22/55 = 40% and 11/55 = 20%, then subtract. Random assignment supports a comparison between these groups, while the study's setting limits how widely the result can be applied.

CHALLENGE

21/30 = 70% of respondents favor it. Of all 50 selected students, the smallest possible percentage is 21/50 = 42%, and the largest is 41/50 = 82%. The headline is not certain to be true because the 20 students who did not reply could bring the percentage below 50%.

Accept equivalent fractions or decimals for rates. For method weaknesses, accept a specific, plausible way the study could miss or unevenly represent the population.