LESSON MAKER PRO

Risk Check

Compare group rates before judging a claim.

HIGH SCHOOL · A1P.DSP.A

A1P.DSP.A "Mathematical and statistical reasoning about data can be used to evaluate conclusions and assess risks."

NAME _____ DATE _____

COMPARE THE RATES

Find a group's risk by dividing the number with an outcome by the total in that group. Subtract two rates to find a difference in percentage points, or divide one rate by the other to find relative risk. Different rates show an association, but they do not prove what caused it.

WORKED EXAMPLE

At two pickup stations, packages arrived late as shown. How many percentage points higher was the late-arrival rate at Station M?

LATE PACKAGES

Station	Late	Total
M	13	50
N	8	50

1. Station M: 13/50 = 26%.
2. Station N: 8/50 = 16%.
3. Subtract the rates: 26% - 16% = 10 percentage points.

Answer: Station M's late-arrival rate was 10 percentage points higher.

PRACTICE 6 problems

1 What percent of students in Group A reported a headache?

HEADACHE REPORTS

Group	Reported a headache	Total
A	6	20
B	3	20

ANSWER _____

2 How many percentage points higher was the missed-bus rate for late riders than for early riders?

MISSED BUSES

Riders	Missed the bus	Total
Early	2	40
Late	10	40

ANSWER _____

3 How many times as high was the incident rate for Group A as for Group B?

REPORTED INCIDENTS

Group	Had an incident	Total
A	12	60
B	3	60

ANSWER _____

4 Which group had the higher absence rate, and by how many percentage points?

ABSENCES

Group	Absent	Total
A	9	30
B	6	40

ANSWER _____

5 A student says Group A had a higher incident rate because it had more incidents. Is that correct? Give both rates.

INCIDENTS BY GROUP

Group	Had an incident	Total
A	18	90
B	12	40

ANSWER _____

6 A student says using the sleep app caused more students to feel tired. Is that claim justified by these data? Give both rates.

SLEEP APP SURVEY

App use	Felt tired	Total
Used app	5	25
Did not use app	2	20

ANSWER _____

APPLY IT Show your work

1 Students tracked whether two lunch lines got them to class late. Find the late-to-class rate for each line and the difference in percentage points.

LUNCH LINES

Line	Late to class	Total students
Sandwich	15	75
Salad	6	60

ANSWER _____

2 Friends compared tickets bought through two resale sites. What was the relative risk of a ticket being rejected for Site P buyers compared with Site Q buyers?

RESALE TICKETS

Site	Rejected tickets	Total tickets
P	18	120
Q	4	80

ANSWER _____

CHALLENGE One step up

An overall report says students without tutoring were more likely to pass. Find the overall pass rate for each tutoring group and the pass rates within each course level. Explain why the overall comparison can mislead.

COURSE RESULTS

Course level	Tutoring	Passed	Total
Hard	Yes	12	60
Hard	No	1	10
Easy	Yes	18	20
Easy	No	56	70

WORK SPACE AND ANSWER

ANSWER KEY # Risk Check

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	What percent of students in Group A reported a headache?	**30%**
2	How many percentage points higher was the missed-bus rate for late riders than for early riders?	**20 percentage points**
3	How many times as high was the incident rate for Group A as for Group B?	**4 times as high**
4	Which group had the higher absence rate, and by how many percentage points?	**Group A, by 15 percentage points**
5	A student says Group A had a higher incident rate because it had more incidents. Is that correct? Give both rates.	**No. Group A's rate was 20%, and Group B's rate was 30%.**
6	A student says using the sleep app caused more students to feel tired. Is that claim justified by these data? Give both rates.	**No. The rates were 20% for app users and 10% for nonusers, but the difference does not prove the app caused tiredness.**

PART 2 · APPLY IT

1. **Sandwich line: 20%. Salad line: 10%. The sandwich line's rate was 10 percentage points higher.** Divide 15 by 75 and 6 by 60 to get the two rates. Subtract 10% from 20%.
2. **The risk for Site P buyers was 3 times as high as for Site Q buyers.** The rejection rates were 18/120 = 15% and 4/80 = 5%. Divide 15% by 5% to get 3.

CHALLENGE

Overall, 30/80 = 37.5% of tutored students passed, compared with 57/80 = 71.25% of students without tutoring. In the hard course, the rates were 20% with tutoring and 10% without; in the easy course, they were 90% with tutoring and 80% without. Tutored students had a higher pass rate at each level, but more of them took the hard course. Combining the levels hides that difference.

Accept equivalent fractions or decimals for rates when they are exact. For causal claims, accept any clear statement that the observed rates alone do not establish cause.