LESSON MAKER PRO

Risk in the Numbers

Use rates to check claims about data.

HIGH SCHOOL · A2S.DSP.A

A2S.DSP.A "Mathematical and statistical reasoning about data can be used to evaluate conclusions and assess risks."

NAME _____ DATE _____

COMPARE THE RATES

To find an observed risk, divide the number of times an event happened by the total number of chances it had to happen. Change the result to a percent before comparing groups, especially when the groups have different totals. A difference in rates does not prove what caused it.

WORKED EXAMPLE

Which route had a higher observed late-arrival rate, and by how many percentage points?

RECORDED RIDES

Route	Late rides	Total rides
A	13	52
B	11	55

1. Route A: 13/52 = 1/4 = 25%.
2. Route B: 11/55 = 1/5 = 20%.
3. 25% - 20% = 5 percentage points.

Answer: Route A, by 5 percentage points.

PRACTICE 6 problems

1 What percent of Art Club members were absent?

CLUB ATTENDANCE

Club	Absent members	Total members
Art	8	16
Music	10	50

ANSWER _____

2 Do the two plans have the same error rate? State each rate.

APP TESTS

Plan	Errors	Tests
Basic	6	60
Plus	8	80

ANSWER _____

3 Which way of traveling had a higher delay rate, and by how many percentage points?

TRIPS RECORDED

Travel	Delayed trips	Total trips
Bike	4	16
Bus	18	90

ANSWER _____

4 How many percentage points higher was the request rate among users with the feature than among users without it?

FEATURE REQUESTS

Feature	Users who requested help	Total users
On	18	60
Off	16	80

ANSWER _____

5 A student says Shift A had a higher injury rate because it had more injuries. Is the student correct? Use both rates to justify your answer.

INJURIES DURING ONE MONTH

Shift	Workers injured	Total workers
A	8	100
B	6	50

ANSWER _____

6 If the same damage rate continues, about how many of the next 160 packages would be damaged?

PACKAGES CHECKED

Damaged packages	Total packages
12	80

ANSWER _____

APPLY IT Show your work

1 You are comparing two job boards. During one week, students flagged the messages shown as scams. Which board had the higher flagged-message rate, and by how many percentage points?

JOB BOARD MESSAGES

Board	Flagged messages	Messages received
Campus	12	60
Local	16	160

ANSWER _____

2 Students chose whether to mute a deadline app's alerts. A classmate claims that muting alerts causes students to miss fewer deadlines. Do the rates support an association? Do they prove the cause? Explain.

APP ALERTS AND MISSED DEADLINES

Alerts	Students who missed a deadline	Students surveyed
Muted	15	75
On	24	80

ANSWER _____

CHALLENGE One step up

Two study methods were used on easy and hard practice questions. Which method had the higher success rate for each type of question? Which had the higher success rate overall? Explain why the answers differ.

PRACTICE QUESTION RESULTS

Method	Question type	Correct	Attempted
A	Easy	8	10
A	Hard	18	30
B	Easy	28	40
B	Hard	5	10

WORK SPACE AND ANSWER

ANSWER KEY

Risk in the Numbers

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	What percent of Art Club members were absent?	**50%**
2	Do the two plans have the same error rate? State each rate.	**Yes. Both error rates are 10%.**
3	Which way of traveling had a higher delay rate, and by how many percentage points?	**Bike, by 5 percentage points (25% versus 20%).**
4	How many percentage points higher was the request rate among users with the feature than among users without it?	**10 percentage points**
5	A student says Shift A had a higher injury rate because it had more injuries. Is the student correct? Use both rates to justify your answer.	**No. Shift A's rate was 8%, while Shift B's was 12%.**
6	If the same damage rate continues, about how many of the next 160 packages would be damaged?	**24 packages**

PART 2 · APPLY IT

1. **Campus, by 10 percentage points (20% versus 10%).** Divide flagged messages by messages received for each board. Campus is 12/60 = 20%, and Local is 16/160 = 10%.
2. **Yes, the data show an association: 20% of students with muted alerts missed a deadline, compared with 30% of students with alerts on. No, the data do not prove that muting caused the difference because students chose their own settings.** Calculate 15/75 = 20% and 24/80 = 30%. The groups may differ in other ways, so the difference in rates does not establish a cause.

CHALLENGE

Method A had the higher rate for easy questions (80% versus 70%) and hard questions (60% versus 50%). Method B had the higher rate overall: 33/50 = 66%, compared with 26/40 = 65% for A. Easy questions made up a larger share of B's attempts, raising B's overall rate.

Accept equivalent fractions or decimals when they clearly represent the correct rates. For the challenge, accept an explanation that identifies the different mix of easy and hard questions.