LESSON MAKER PRO

Cause or Coincidence?

Compare rates, then judge the evidence.

HIGH SCHOOL · FA.S.45

FA.S.45 "Understand the difference between correlation and causation and identify real-world contexts that depict each of them. (S-ID.9)"

NAME _____ DATE _____

THE BIG IDEA

A difference in outcome rates shows an association, not necessarily a cause. Divide each group's outcome count by its total, then subtract the rates. Random assignment can support a causal claim because it helps balance other factors between groups.

WORKED EXAMPLE

Students were randomly assigned to use a quiz app or not. How much higher was the pass rate with the app? Does the study support a causal claim?

QUIZ RESULTS

Group	Passed	Total
App	7	10
No app	3	10

1. App pass rate: 7/10 = 70%.
2. No-app pass rate: 3/10 = 30%.
3. Subtract: 70% - 30% = 40 percentage points.

Answer: The app group's pass rate was 40 percentage points higher. Random assignment supports a causal claim.

PRACTICE 4 problems

1 Of 16 gamers who chose a new mouse, 12 won. Of 16 who did not, 8 won. Find the percentage-point gap. Does this prove the mouse caused more wins?

ANSWER _____

2 Students were randomly assigned study cards or no cards. In each group of 24, either 18 or 6 students passed, respectively. Find the percentage-point gap. Is a causal claim supported?

ANSWER _____

3 A survey finds that students who sleep longer tend to earn higher grades. Name another factor that could affect both sleep and grades.

ANSWER _____

4 Before a phone setting changed, 14 of 28 students finished homework. Afterward, 21 of 28 did. Find the percentage-point change. Does this prove the setting caused it?

ANSWER _____

APPLY IT Show your work

1 Students chose whether to turn on a video app's focus alerts. Find the percentage-point gap in projects finished. Could the alerts be the cause, or could something else explain the gap?

PROJECTS FINISHED

Alerts	Finished	Total
On	27	36
Off	18	36

ANSWER _____

2 An esports coach randomly assigns 20 players to an aim drill and 20 to their usual routine. Scores improve for 16 drill players and 12 usual-routine players. Find the percentage-point gap. Does the design support a causal claim?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Students chose whether to use a practice app. Which group has the higher overall pass rate? Compare pass rates within each skill level. Why does the overall result not establish an app effect?

PRACTICE APP AND TEST RESULTS

Skill level	App	Passed	Total
Advanced	Used	18	24
Advanced	Not used	8	8
Beginner	Used	0	8
Beginner	Not used	6	24

WORK SPACE AND ANSWER

Cause or Coincidence?

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Of 16 gamers who chose a new mouse, 12 won. Of 16 who did not, 8 won. Find the percentage-point gap. Does this prove the mouse caused more wins?	**25 percentage points; no, gamers chose their own groups.**
2	Students were randomly assigned study cards or no cards. In each group of 24, either 18 or 6 students passed, respectively. Find the percentage-point gap. Is a causal claim supported?	**50 percentage points; yes, random assignment supports a causal claim.**
3	A survey finds that students who sleep longer tend to earn higher grades. Name another factor that could affect both sleep and grades.	**A consistent home schedule could allow more sleep and more time to study.**
4	Before a phone setting changed, 14 of 28 students finished homework. Afterward, 21 of 28 did. Find the percentage-point change. Does this prove the setting caused it?	**25 percentage points; no, other changes could explain the increase.**

PART 2 · APPLY IT

1. **25 percentage points; students who chose alerts might also have had stronger work habits.** The rates are 27/36 = 75% and 18/36 = 50%. Because students chose their groups, the gap does not establish a cause.
2. **20 percentage points; yes, random assignment supports a causal claim about the drill.** The improvement rates are 16/20 = 80% and 12/20 = 60%, a gap of 20 percentage points.

CHALLENGE

App users have the higher overall pass rate: 18/32 = 56.25%, versus 14/32 = 43.75%. Within each skill level, app users have the lower rate: 75% versus 100% for advanced students and 0% versus 25% for beginners. More advanced students chose the app, so the overall association does not establish an app effect.

Accept equivalent rate differences stated in percentage points. For explanations, accept any plausible factor affecting both group choice and outcome.