LESSON MAKER PRO

Fair Study, Fair Claim

Compare results and check how the groups were formed.

HIGH SCHOOL · S.DC.2

S.DC.2 "Identify common sources of bias and the role of randomization in study design. Explain how randomization and sources of bias impact the results of a study..."

NAME _____ DATE _____

RATES AND RANDOMNESS

To compare outcomes, divide each group's successes by its total, then subtract the percentages. Random selection helps a sample represent a population. Random assignment helps make treatment groups comparable, while volunteers or self-chosen groups may introduce bias.

WORKED EXAMPLE

Students are randomly assigned to two routes to class. Use the table to find the gap in on-time rates.

ROUTES TO CLASS

Route	Students	On time
New route	16	12
Usual route	16	4

1. New route: 12/16 = 75%.
2. Usual route: 4/16 = 25%.
3. Subtract: 75% - 25% = 50 percentage points.

Answer: The new route's on-time rate is 50 percentage points higher.

PRACTICE 4 problems

1 Two groups of 10 students are randomly assigned different warm-ups. In one group, 9 feel ready to exercise; in the other, 6 do. Find the rate gap.

ANSWER _____

2 Of 40 randomly selected students, 28 prefer a later school start. What percent of the sample prefers it?

ANSWER _____

3 An optional online poll gets 30 replies. Of these, 27 favor a later start. Find the percent and name a possible source of bias.

ANSWER _____

4 Ten students choose a study app, and 10 choose not to use it. Seven app users and 5 nonusers raise their scores. Find the rate gap and name a design flaw.

ANSWER _____

APPLY IT Show your work

1 Students are randomly assigned to study with a playlist or in silence. Use the table to find the gap in improvement rates. Does random assignment help support a claim that the playlist caused the difference?

QUIZ SCORES

Group	Students	Scores improved
Playlist	35	21
Silence	35	14

ANSWER _____

2 A school app poll gets 100 replies. Of these, 82 students want shorter lunch lines. Only students with phones can reply. Find the reported percent and explain why it may not represent the whole school.

WORK SPACE

ANSWER _____

CHALLENGE One step up

A school randomly selects 60 students, then randomly assigns 30 to each of two note-taking methods. In method A, 24 improve; in method B, 18 improve. Find the rate gap. Which random step supports a causal claim, and which supports applying the results to this school?

WORK SPACE AND ANSWER

ANSWER KEY

Fair Study, Fair Claim

HIGH SCHOOL · S.DC.2

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Two groups of 10 students are randomly assigned different warm-ups. In one group, 9 feel ready to exercise; in the other, 6 do. Find the rate gap.	**30 percentage points**
2	Of 40 randomly selected students, 28 prefer a later school start. What percent of the sample prefers it?	**70%**
3	An optional online poll gets 30 replies. Of these, 27 favor a later start. Find the percent and name a possible source of bias.	**90%; voluntary-response bias**
4	Ten students choose a study app, and 10 choose not to use it. Seven app users and 5 nonusers raise their scores. Find the rate gap and name a design flaw.	**20 percentage points; students chose their own groups.**

PART 2 · APPLY IT

1. **20 percentage points. Yes, random assignment helps support a causal claim.** The rates are 21/35 = 60% and 14/35 = 40%. Random assignment helps balance other influences between the groups.
2. **82%. Students without phones were excluded, and students chose whether to reply.** Compute 82/100 = 82%. Phone access creates coverage bias, and the optional poll may have voluntary-response bias.

CHALLENGE

The gap is 24/30 - 18/30 = 80% - 60% = 20 percentage points. Random assignment supports a causal claim; random selection supports applying the results to this school.

Accept equivalent descriptions of self-selection or voluntary-response bias. Rate gaps are in percentage points, not percent.