LESSON MAKER PRO

Does It Matter?

Compare statistical evidence with a change that matters.

HIGH SCHOOL · S.IR.2.1

S.IR.2.1 "Develop and critique arguments for practical implications based on statistical significance."

NAME _____ DATE _____

TWO CHECKS

A result is statistically significant when $p < 0.05$. To judge its practical value, find the observed change and compare it with the minimum change that matters. A significant result can still be too small to be useful.

WORKED EXAMPLE

A new route is useful if it saves at least 6 minutes. A study reports $p = 0.01$. Is the result significant, and does the observed change meet the goal?

AVERAGE COMMUTE TIME

Route	Minutes
Old	30
New	26

1. Find the change: 30 - 26 = 4 minutes.
2. Check significance: 0.01 < 0.05.
3. Check the goal: 4 < 6 minutes.

Answer: The result is significant, but the observed change does not meet the goal.

PRACTICE 4 problems

1 Study time falls from 18 to 10 minutes; $p = 0.02$. At least 5 minutes matters. Is the result significant? Does the change meet the goal?

ANSWER _____

2 Locker wait time falls from 21 to 12 minutes; $p = 0.12$. At least 7 minutes matters. Is the result significant? Does the change meet the goal?

ANSWER _____

3 Video load time falls from 14 to 11 seconds; $p = 0.03$. At least 4 seconds matters. Is the result significant? Does the change meet the goal?

ANSWER _____

4 Free-throw accuracy rises from 40% to 43%; $p = 0.05$. At least 5 percentage points matters. Is the result significant? Does the change meet the goal?

ANSWER _____

APPLY IT Show your work

1 A school tests a study app with randomly assigned groups. The test gives p = 0.04. A gain of at least 7 points matters. Find the gain, then decide whether the result is significant and meets the goal.

AVERAGE QUIZ SCORES

Group	Score
No app	72
App	77

ANSWER _____

2 An esports club tests a warm-up. Average reaction time falls from 240 to 228 milliseconds; p = 0.09. A decrease of at least 10 milliseconds matters. Critique this claim: "The warm-up is proven to help."

WORK SPACE

ANSWER _____

CHALLENGE One step up

Two bus-pass trials report these results: A saves 11 minutes, p = 0.03; B saves 15 minutes, p = 0.07. At least 9 minutes matters. Critique this claim: "B is the better supported choice because it saves more."

WORK SPACE AND ANSWER

Does It Matter?

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Study time falls from 18 to 10 minutes; p = 0.02. At least 5 minutes matters. Is the result significant? Does the change meet the goal?	**Yes, it is significant. The 8-minute drop meets the goal.**
2	Locker wait time falls from 21 to 12 minutes; p = 0.12. At least 7 minutes matters. Is the result significant? Does the change meet the goal?	**No, it is not significant. The observed 9-minute drop meets the goal.**
3	Video load time falls from 14 to 11 seconds; p = 0.03. At least 4 seconds matters. Is the result significant? Does the change meet the goal?	**Yes, it is significant. The 3-second drop does not meet the goal.**
4	Free-throw accuracy rises from 40% to 43%; p = 0.05. At least 5 percentage points matters. Is the result significant? Does the change meet the goal?	**No, it is not significant. The 3-percentage-point gain does not meet the goal.**

PART 2 · APPLY IT

1. **The gain is 5 points. The result is significant, but the gain does not meet the goal.** Subtract 72 from 77. Since 0.04 < 0.05 but 5 < 7, only the significance check is met.
2. **The observed decrease is 12 milliseconds, which meets the goal. Because 0.09 is not less than 0.05, the study does not provide statistically significant evidence that the warm-up helps.** Subtract 228 from 240, then compare 12 with 10 and 0.09 with 0.05. Meeting the practical goal in the study does not make the result statistically significant.

CHALLENGE

Both observed savings meet the goal, but only A is statistically significant. B shows a larger observed saving, yet its result does not provide statistically significant evidence of a benefit.

Accept equivalent wording that separates the observed change from the strength of the evidence. A nonsignificant result does not prove there is no effect.