LESSON MAKER PRO

Decisions With Data

Use confidence intervals to choose a course of action.

HIGH SCHOOL · MM.D3D.C.20.b

MM.D3D.C.20.b "Interpret a confidence interval in context and use it to make strategic decisions."

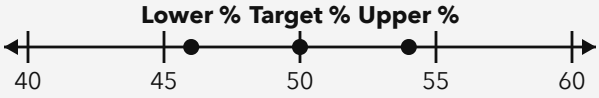
NAME _____ DATE _____

CHECK THE WHOLE INTERVAL

A 95% confidence interval gives a range of plausible values for a population percentage or mean. To support a decision that requires a value above a target, the whole interval must be above it. If the interval includes the target, the evidence is not strong enough for that decision.

WORKED EXAMPLE

A 95% confidence interval estimates the percent of students who want later club meetings. Move meetings later only if the whole interval is above 50%. Decide.



1. Read the interval: 46% to 54%.
2. The interval includes the 50% target.
3. It does not support a percentage above 50%.

Answer: Do not move meetings later based on this interval.

PRACTICE 4 problems

1 A 95% interval for student support of a school event is 61% to 69%. Hold it only if support is above 60%. Does the interval support holding it?

ANSWER _____

2 A 95% interval for approval of a new app is 40% to 48%. Promote it only if approval is above 45%. Does the interval support promotion?

ANSWER _____

3 A 95% interval for the mean lunch wait is 14 to 18 minutes. Add a checkout station only if the mean exceeds 20 minutes. Does the interval support adding one?

ANSWER _____

4 A 95% interval for the mean daily bus wait of all students is 8 to 12 minutes. Interpret the interval in context.

ANSWER _____

APPLY IT Show your work

1 A gaming club needs a streaming service with mean lag below 35 ms. The table gives 95% confidence intervals. Which service meets the rule?

MEAN LAG INTERVALS

Service	Lower (ms)	Upper (ms)
A	28	34
B	30	38

ANSWER _____

2 A club will order shirts only if mean profit exceeds $5 per shirt. A 95% interval for mean profit is $3 to $7. Does the interval support ordering? Explain.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Two surveys estimate the share of students who would use a tutoring app. Their 95% intervals are A: 52% to 68% and B: 57% to 63%. Launch only if the whole interval is above 55%. Which survey supports launch, and which gives the more precise estimate? Explain.

WORK SPACE AND ANSWER

ANSWER KEY

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A 95% interval for student support of a school event is 61% to 69%. Hold it only if support is above 60%. Does the interval support holding it?	**Yes. The whole interval is above 60%.**
2	A 95% interval for approval of a new app is 40% to 48%. Promote it only if approval is above 45%. Does the interval support promotion?	**No. The interval includes 45%.**
3	A 95% interval for the mean lunch wait is 14 to 18 minutes. Add a checkout station only if the mean exceeds 20 minutes. Does the interval support adding one?	**No. The whole interval is below 20 minutes.**
4	A 95% interval for the mean daily bus wait of all students is 8 to 12 minutes. Interpret the interval in context.	**We are 95% confident that the mean daily bus wait for all students is between 8 and 12 minutes.**

PART 2 · APPLY IT

1. **Service A only.** A's whole interval is below 35 ms. B's interval includes values above 35 ms.
2. **No. The interval includes mean profits below $5, so it does not support ordering under the club's rule.** Compare both endpoints with $5. The lower endpoint is $3, so the whole interval is not above the target.

CHALLENGE

Only B supports launch because its whole interval is above 55%. B is also more precise: its width is 6 percentage points, compared with 16 for A.

Accept equivalent wording that refers to the population percentage or mean, not just the sampled students. An interval that includes a target does not establish that the population value is above it.