LESSON MAKER PRO

What Fits the Interval?

Estimate, compare, and explain survey results.

HIGH SCHOOL · S.IR.1.2

S.IR.1.2 "Understand the concept of a confidence interval, including the interpretation of confidence level, margin of error, and statistical significance."

NAME _____ DATE _____

THE BIG IDEA

The midpoint of a confidence interval is the estimate. The distance from the midpoint to either end is the margin of error. A 95% confidence method captures the true value in about 95% of repeated samples. If a proposed value is outside a 95% interval, the difference is statistically significant at the 5% level.

WORKED EXAMPLE

Use the survey result to find the estimate and margin of error. Is support significantly above 60% at the 10% level?

SURVEY RESULT

Confidence level	Interval for support
90%	63% to 73%

1. Find the midpoint: (63% + 73%) / 2 = 68%.
2. Find the margin: 73% - 68% = 5%.
3. 60% is below the entire 90% interval.

Answer: The estimate is 68%, with a 5 percentage point margin of error. Yes, support is significantly above 60% at the 10% level.

PRACTICE 4 problems

1 A confidence interval is 22% to 30%. Find its estimate and margin of error.

ANSWER _____

2 An estimate is 45% with a margin of error of 6 percentage points. Write the interval.

ANSWER _____

3 A 95% confidence interval is 51% to 59%. Is the result significantly above 50% at the 5% level? Explain.

ANSWER _____

4 An 80% confidence method is used on many random samples. About how many of 100 intervals will capture the true value?

ANSWER _____

APPLY IT Show your work

1 Students vote on a later school start. A 95% confidence interval for support is 54% to 62%. Find the estimate and margin of error. Is support significantly above 50% at the 5% level?

WORK SPACE

ANSWER _____

2 A gaming club tries a new signup link. Its old signup rate was 40%. A 95% confidence interval for the new rate is 37% to 47%. Is an increase statistically significant at the 5% level? Explain.

WORK SPACE

ANSWER _____

CHALLENGE One step up

An app polls students about a new feature. Which interval shows support significantly above 50% at its matching level? Give the margin of error for each interval.

INTERVALS FOR SUPPORT

Confidence level	Interval
95%	52% to 60%
99%	49% to 63%

WORK SPACE AND ANSWER

ANSWER KEY

What Fits the Interval?

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A confidence interval is 22% to 30%. Find its estimate and margin of error.	**Estimate: 26%. Margin of error: 4 percentage points.**
2	An estimate is 45% with a margin of error of 6 percentage points. Write the interval.	**39% to 51%**
3	A 95% confidence interval is 51% to 59%. Is the result significantly above 50% at the 5% level? Explain.	**Yes. The entire interval is above 50%.**
4	An 80% confidence method is used on many random samples. About how many of 100 intervals will capture the true value?	**About 80 intervals.**

PART 2 · APPLY IT

1. **The estimate is 58%, and the margin of error is 4 percentage points. Yes, the entire interval is above 50%.** The midpoint is (54% + 62%) / 2 = 58%, and 62% - 58% = 4%. Since 50% is below the interval, support is significantly above 50% at the 5% level.
2. **No. The interval includes the old rate of 40%.** Because 40% falls inside the 95% interval, the data do not show a statistically significant increase at the 5% level.

CHALLENGE

The 95% interval shows support significantly above 50% at the 5% level; its margin of error is 4 percentage points. The 99% interval includes 50%, so it does not show significance at the 1% level; its margin of error is 7 percentage points.

Accept margins stated as percentage points. Significance conclusions use the two-sided level matching each confidence interval.