LESSON MAKER PRO

Simulation Reality Check

Build a 95% simulation interval and test a claim.

HIGH SCHOOL · AII-S.IC.4

AII-S.IC.4 "Given a simulation model based on a sample proportion or mean, construct the 95% interval centered on the statistic (+/- two standard deviations) and determine if a suggested parameter is plausible."

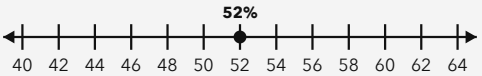
NAME _____ DATE _____

THE BIG IDEA

A 95% simulation interval is the statistic plus or minus 2 simulation standard deviations. A suggested parameter is plausible if it falls in the interval, including an endpoint.

WORKED EXAMPLE

A simulation is centered at a sample proportion of 52% with a standard deviation of 3%. Is a population proportion of 55% plausible?



1. 2(3%) = 6%.
2. Lower endpoint: 52% - 6% = 46%.
3. Upper endpoint: 52% + 6% = 58%.
4. Since 55% is from 46% to 58%, it is plausible.

Answer: 95% interval: 46% to 58%; 55% is plausible.

PRACTICE 4 problems

1 A simulation for a sample proportion is centered at 40% with standard deviation 4%. Is 48% plausible?

ANSWER _____

2 A simulation for a sample mean is centered at 18 with standard deviation 5/2. Is 24 plausible?

ANSWER _____

3 A simulation for a sample proportion is centered at 68% with standard deviation 3%. Is 62% plausible?

ANSWER _____

4 A simulation for a sample mean is centered at 75 with standard deviation 4. Is 66 plausible?

ANSWER _____

APPLY IT Show your work

1 A student council survey finds that 60% of students want more vegetarian lunch choices. A simulation model has standard deviation 5%. The district says the population proportion is 49%. Is the district's value plausible?

WORK SPACE

ANSWER _____

2 An esports club samples students and finds a mean of 12 gaming hours per week. Its simulation model has standard deviation 1.5 hours. Is a claimed population mean of 15 hours plausible?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Two simulation models are centered at a sample mean of 80. Model A has standard deviation 3, and Model B has standard deviation 4. A suggested population mean is 87. Construct both intervals, decide which model makes 87 plausible, and explain why.

WORK SPACE AND ANSWER

ANSWER KEY

Simulation Reality Check

PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	A simulation for a sample proportion is centered at 40% with standard deviation 4%. Is 48% plausible?	**95% interval: 32% to 48%; yes, 48% is plausible.**
2	A simulation for a sample mean is centered at 18 with standard deviation 5/2. Is 24 plausible?	**95% interval: 13 to 23; no, 24 is not plausible.**
3	A simulation for a sample proportion is centered at 68% with standard deviation 3%. Is 62% plausible?	**95% interval: 62% to 74%; yes, 62% is plausible.**
4	A simulation for a sample mean is centered at 75 with standard deviation 4. Is 66 plausible?	**95% interval: 67 to 83; no, 66 is not plausible.**

PART 2 · APPLY IT

1. **95% interval: 50% to 70%; 49% is not plausible.** Compute 60% plus or minus 2(5%), giving 50% to 70%. Since 49% is below the interval, reject it as implausible.
2. **95% interval: 9 to 15 hours; 15 hours is plausible.** Compute 12 plus or minus 2(1.5), giving 9 to 15 hours. Since 15 is an endpoint, it is plausible.

CHALLENGE

Model A: 74 to 86, so 87 is not plausible. Model B: 72 to 88, so 87 is plausible. Model B has a larger standard deviation, so its interval is wider.

Accept interval notation or endpoint wording. Treat a suggested value equal to an endpoint as plausible.