

# Unit 4 Construct & Interpret Confidence Intervals

Content Area: **Mathematics**  
Course(s): **AP Statistics**  
Time Period: **November**  
Length: **4 weeks**  
Status: **Published**

## Transfer Skills

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Students will be able to independently use their learning to construct and interpret confidence intervals.

## Enduring Understandings

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A point estimate is used to establish a value for a population parameter.

A confidence interval is a range of plausible values for a characteristic of a population.

Confidence intervals are always two tailed and the confidence level relates to the area under the curve between the interval.

Standard error is the estimated standard deviation of the statistic.

## Essential Questions

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How can a confidence interval be interpreted in context of the problem?

How is the width of the interval affected by changes in sample size or confidence level?

How can a sample size be determined for a study that would place your results within a specified error?

Can confidence intervals be used to draw conclusions about a claim?

## **Content**

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### Red Hot Topics:

Interval for one mean

Interval for sample proportion

Establish confidence level

Select sample size

Interval for difference of 2 means or proportions

### Vocabulary: Point estimate

Confidence level

Critical values

Standard error

Margin of error

critical value

Two tailed

## **Skills**

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Calculate a point estimate from a sample.

Use formula to create a confidence interval for a sample mean.

Categorize the relationship between the interval and a normal curve.

Interpret the interval in words in context of the problem.

Find confidence interval for one sample proportion.

Correlate the relationship between sample size and width of confidence interval.

Work backwards to find sample size needed for a given study.

Calculate and interpret intervals for the difference of two sample means or proportions.

## Resources

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## Standards

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### Need to Add CollegeBoard Standards

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|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CCSS.Math.Content.HSS-IC     | Making Inferences and Justifying Conclusions                                                                                                                   |
| CCSS.Math.Content.HSS-IC.A   | Understand and evaluate random processes underlying statistical experiments                                                                                    |
| CCSS.Math.Content.HSS-IC.A.1 | Understand statistics as a process for making inferences about population parameters based on a random sample from that population.                            |
| CCSS.Math.Content.HSS-IC.A.2 | Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation.                                           |
| CCSS.Math.Content.HSS-IC.B   | Make inferences and justify conclusions from sample surveys, experiments, and observational studies                                                            |
| CCSS.Math.Content.HSS-IC.B.3 | Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.             |
| CCSS.Math.Content.HSS-IC.B.4 | Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling. |
| CCSS.Math.Content.HSS-IC.B.5 | Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.                  |
| CCSS.Math.Content.HSS-IC.B.6 | Evaluate reports based on data.                                                                                                                                |