



Marietta City Schools
2025–2026 District Unit Planner

AP Statistics

Unit title	Unit 7: Inference for Quantitative Data: Means	Unit duration (hours)	12-15 hours
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Mastering Content and Skills through INQUIRY (Establishing the purpose of the Unit): *What will students learn?*

In this unit, students will analyze quantitative data to make inference about population means. Students should understand that t^* and t-tests are used for inference with means when the population standard deviation is not known. Using sample standard deviation in the formula for z gives a slightly different value, t, whose distribution, which depends on sample size, has more area in the tails than a normal distribution. The boundaries for rejecting a null hypothesis using a t-distribution tend to be further from the mean than for a normal distribution. Students should understand how and why conditions for inference with proportions and means are similar and different.

GA DoE Standards

Standards

- 7.1 Introducing Statistics: Should I Worry About Error?
- 7.2 Constructing a Confidence Interval for a Population Mean
- 7.3 Justifying a Claim About a Population Mean Based on a Confidence Interval
- 7.4 Setting Up a Test for a Population Mean
- 7.5 Carrying Out a Test for a Population Mean
- 7.6 Confidence Intervals for the Difference of Two Means
- 7.7 Justifying a Claim About the Difference of Two Means Based on a Confidence Interval
- 7.8 Setting Up a Test for a Difference of Two Population Means
- 7.9 Carrying Out a Test for the Difference of Two Population Means
- 7.10 Skills Focus: Selecting, Implementing and Communicating Inference Procedures

Concepts/Skills to support mastery of standards

- Determine the critical value for calculating a C% confidence interval for a population mean
- State and check the 10%, random sample, and normal/large sample conditions for constructing a confidence interval for a population mean
- Construct and interpret a confidence interval for a population mean
- Determine whether the conditions are met for constructing a Confidence Interval for a difference between 2 means
- Construct and interpret a Confidence interval for a difference between 2 means

- Analyze the distribution of difference in a paired data set using graphs and summary statistics
- Construct and interpret a confidence interval for mean difference
- State and check the random, 10%, and Normal/Large Sample Conditions for performing a significance test about a population mean.
- Calculate the standardized test statistic and P value for a test about a population mean
- Perform a significance test about a population mean
- Understand the connection between confidence intervals and significance tests
- State appropriate hypothesis for a significance test about a difference between 2 means
- Determine whether the conditions are met for performing a test about a difference between means
- State appropriate hypotheses for a significance test about a difference in means
- Determine whether the conditions are met for performing test about a difference between 2 means
- Calculate the standardized test statistic and p value for a test about a difference between 2 means
- Perform a significance test about a difference between 2 means
- Perform a significance test about mean difference
- Determine when it is appropriate to use paired t procedures versus 2 sample t procedures

Vocabulary

Critical Value	Random Condition	10% condition	Normal/Large Sample Condition	1 sample t interval	2 sample t interval
Sample Size	Plausible Values	Point Estimate	Null Hypothesis	Alternative Hypothesis	Confidence Level
Margin of error	Central Limit Theorem	P value	Standardized Test Statistic	1 sided significance test	2 sided significance test

Notation

Sampling distributions for means:

Random Variable	Parameters of Sampling Distribution		Standard Error* of Sample Statistic
For one population: \bar{X}	$\mu_{\bar{X}} = \mu$	$\sigma_{\bar{X}} = \frac{\sigma}{\sqrt{n}}$	$s_{\bar{X}} = \frac{s}{\sqrt{n}}$
For two populations: $\bar{X}_1 - \bar{X}_2$	$\mu_{\bar{X}_1 - \bar{X}_2} = \mu_1 - \mu_2$	$\sigma_{\bar{X}_1 - \bar{X}_2} = \sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}$	$s_{\bar{X}_1 - \bar{X}_2} = \sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}$

Essential Questions

- How do we know whether to use a t -test or a z -test for inference with means?
- How can we make sure that samples are independent?
- Why is it inappropriate to accept a hypothesis as true based on the results of statistical inference testing?
- How do we interpret a confidence interval and/or level in context?
- How do we determine the point estimate and margin of error of a confidence interval?
- What will affect the length of the confidence interval?
- How do we construct and interpret a confidence interval for a population mean?

Assessment Tasks

List of common formative and summative assessments.

Formative Assessment(s):

Common Formative Assessment – Ticket out the Door

Summative Assessment(s):

Common Summative Assessment – Unit 7 Test (50% Multiple Choice/50% Free Response)

Learning Experiences

Add additional rows below as needed.

Objective or Content	Learning Experiences		Personalized Learning and Differentiation
<p>3D Construct a confidence interval, provided conditions for inference are met.</p> <p>4D Justify a claim based on a confidence interval</p>	<p>Math Medic Lesson: Estimating a population mean (How much screen time?)</p> <ol style="list-style-type: none"> Determine the critical value for calculating a C% confidence interval for a population mean. State and check the Random, 10%, and Normal/LargeSample conditions for constructing a confidence interval for a population mean. 		<p>Graphic organizers are provided for each lesson and additional practice as needed. Some students will move through the task independently. Others will need prompts and support for understanding.</p>
<p>1F Identify null and alternative hypotheses.</p> <p>3E Calculate a test statistic and find a p-value, provided conditions for inference are met.</p> <p>4E Justify a claim using a decision based on significance tests.</p>	<p>Math Medic Lesson: Significance test for a mean (What is normal body temperature?)</p> <ol style="list-style-type: none"> State and Check the Random, 10%, and Normal/Large Sample conditions for a significance test about a population mean. Calculate the standardized test statistic and P-value for a test about a population mean. Perform a significance test about a population mean. 		<p>Graphic organizers are provided for each lesson and additional practice as needed. Some students will move through the task independently. Others will need prompts and support for understanding.</p>
<p>Content Resources</p>			
<ul style="list-style-type: none"> ● The Practice of Statistics, 5th Edition ● Notes, Review, and Extra Practice provided on Schoology ● College Board ● Stats Medic ● AP Statistics Formula Sheet 			