

Scope and Sequence

Mathematics

AP Statistics

*The purpose of the AP course in statistics is to introduce students to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. Students are exposed to four broad conceptual themes:

1. Exploring Data: Describing patterns and departures from patterns
2. Sampling and Experimentation: Planning and conducting a study
3. Anticipating Patterns: Exploring random phenomena using probability and simulation
4. Statistical Inference: Estimating population parameters and testing hypothesis

*From the CollegeBoard Acorn Book for statistics:

Unit Name/Description	Content and/or Skills
Chapter 1 : Exploring Data	<ul style="list-style-type: none">• Plotting data using dotplot, stemplot, histogram, etc.• How to graph data using the TI-83/84• Interpreting data addressing center, shape , spread, and any outliers• Choosing the appropriate numerical summary to describe the data• Choosing the appropriate graph to display data• Understanding that data has variability
Chapter 2: Describing Location in a Distribution	<ul style="list-style-type: none">• Discovering the properties of a density curve• Recognizing the shape of normal curves

	<ul style="list-style-type: none"> • The 68-95-99.7 rule • z-scores and using the normal curve to estimate probabilities/proportions • How to determine if a distribution is approximately normal
Chapter 3 : Examining Relationships	<ul style="list-style-type: none"> • Categorical vs. Quantitative and Explanatory vs. Response • Creating and interpreting scatter plots • Properties and interpretation of the correlation coefficient • Using the TI-83/84 to find the LSRL • Interpretation of the coefficient of determination
Chapter 4: More about relationships between 2 variables	<ul style="list-style-type: none"> • Recognizing non-linear data patterns • Transforming the data to fit a linear model • Lurking variables vs. confounding • Simpson's paradox
Chapter 5: Producing Data	<ul style="list-style-type: none"> • Explore the different sampling techniques • SRS and the random digit table • The difference between an observational study and experiment • Experimental design: flowchart style and paragraph style • The proper way to conduct an experiment • Recognizing bias and its sources • Cause and effect relationships • Conducting simulations

<p>Chapter 6: Probability & Simulation: The study of randomness</p>	<ul style="list-style-type: none"> • How to determine a sample space • Union, intersection, and complement of events • Mutually exclusive vs. not mutually exclusive • Independent vs. Dependent events • Bayes' Theorem/Using a two-way table • Identifying Permutations vs. Combinations
<p>Chapter 7: Random Variables</p>	<ul style="list-style-type: none"> • Identify Discrete and Continuous variables • Use of the chart and/or the TI-83/84 to determine the area under the normal curve. • How to calculate the mean and variance of a discrete random variable • Law of large numbers • Rules for means and variances
<p>Chapter 8: The Binomial & Geometric Distributions</p>	<ul style="list-style-type: none"> • Identify a random variable as binomial • Calculate binomial probabilities using either the formula or the TI-83/84 • Calculate mean and standard deviation of a binomial distribution • Identify a random variable as geometric • Calculate geometric probabilities using either the formula or the TI-83/84 • Calculate mean and standard deviation of a geometric distribution
<p>Chapter 9: Sampling Distributions</p>	<ul style="list-style-type: none"> • Identifying parameters vs. statistics

	<ul style="list-style-type: none"> • Connection between variability and sample size • Introduction to sample proportions • Calculating the mean and standard deviation of a sampling distribution of sample proportions • Central Limit Theorem
<p>Chapter 10: Estimating with Confidence</p>	<ul style="list-style-type: none"> • Interpreting “95% Confidence” • Constructing a Confidence interval by hand and using the TI-83/84 • How to check conditions of a confidence interval • Introduction to the t distribution • Degrees of freedom • The idea of a robust procedure • Constructing and interpreting a t confidence interval • Calculating sample proportions • Checking the appropriate conditions • Constructing a 1 proportion confidence interval • Nuances of the margin of error • Finding an appropriate sample size
<p>Chapter 11: Testing a Claim</p>	<ul style="list-style-type: none"> • The 4 steps of a Hypothesis Test • Calculating and interpreting the p-value • The role of the TI-83/84 in hypothesis testing • Explain Type I and type II errors

	<ul style="list-style-type: none"> • Recognition of an inference problem
Chapter 12: Significance tests in practice	<ul style="list-style-type: none"> • The 4 steps of a t-test • Matched pairs t-test • Investigating the difference between a population mean and a population proportion • The 4 steps of a 1-proportion z test
Chapter 13: Comparing 2 Population Parameters	<ul style="list-style-type: none"> • Construct and interpret a confidence interval for the difference between two means • Hypothesis test for the difference between two means • Constructing a 2 proportion confidence interval • The 4 steps of a 2 proportion z test
Chapter 14: Chi-Square Procedures	<ul style="list-style-type: none"> • Distinguish between test for goodness of fit and test for association/independence • Organizing data in a two-way table • Calculating expected cell counts • The 4 steps of a Chi-Square test • Determining what contributes most to a Chi-Square statistic
Chapter 15: Inference for Regression	<ul style="list-style-type: none"> • Revisit linear regression including graphing scatterplots and residual plots • Recognize the regression setting • Recognize when inference wouldn't be safe • Understand computer output for regression • The 4 steps of a t-test for slope

- Using the computer output to construct a confidence interval