AP Statistics gives students hands-on experience collecting, analyzing, graphing, and interpreting real-world data. They will learn to effectively design and analyze research studies by reviewing and evaluating real research examples taken from daily life. The next time they hear the results of a poll or study, they will know whether the results are valid. As the art of drawing conclusions from imperfect data and the science of real-world uncertainties, statistics plays an important role in many fields. The equivalent of an introductory college-level course, AP Statistics prepares students for the AP exam and for further study in science, sociology, medicine, engineering, political science, geography, and business.

This course has been authorized by the College Board to use the AP designation.

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Length: Two semesters

UNIT 1: DESCRIBING DATA

LESSON 1: WHAT IS STATISTICS?

Discuss: Introductions
Introduce yourself to your classmates and your instructor.
Duration: 0 hrs 15 mins Scoring: 10 points

Discuss: Errors in Ads (and Other Claims)
Discuss ads containing statistical errors, abuses, and misleading statements.
Duration: 0 hrs 30 mins Scoring: 10 points

Study: Welcome to Statistics
Explore the history of statistics. Examine the main types of statistics and the types of data used in statistics.
Duration: 0 hrs 50 mins

Practice: Welcome to Statistics
Answer questions about the history of statistics, the main types of statistics and the types of data used in statistics.
Duration: 0 hrs 30 mins

Quiz: Types of Data, Types of Statistics
Answer questions on differentiating between counts vs. measures (that is, discrete vs. continuous data), numerical vs. categorical data, and inferential vs. descriptive statistics.
Duration: 0 hrs 50 mins Scoring: 10 points

Practice: Identifying Types of Data and Statistics
Apply your knowledge to explain why a given study is descriptive or inferential and to identify categorical and numerical data.
Duration: 1 hr Scoring: 25 points

LESSON 2: DISPLAYING DISTRIBUTIONS WITH GRAPHS

Quiz: Variables and Distributions
Answer questions to familiarize yourself with statistical terms such as variable and distribution.
Duration: 1 hr Scoring: 10 points

Practice: What Can You Tell From Graphs?
Use information from various kinds of graphs to answer questions.
Duration: 1 hr Scoring: 25 points
Discuss: Choosing Appropriate Graphs
Discuss which type of graph is best for displaying a given data set and why.
Duration: 0 hrs 30 mins Scoring: 10 points

Study: Introduction to Frequency Data and Their Graphs
Explore the different kinds of frequency plots, including histograms, relative frequency plots, cumulative frequency plots, cumulative relative frequency plots, and bar graphs.
Duration: 0 hrs 50 mins

Practice: Introduction to Frequency Data and Their Graphs
Answer questions about the different kinds of frequency plots, including histograms, relative frequency plots, cumulative frequency plots, cumulative relative frequency plots, and bar graphs.
Duration: 0 hrs 30 mins

Quiz: Matching Graphs and Tables
Answer questions based on tables and graphs. Match tables with graphs derived from the same data.
Duration: 0 hrs 50 mins Scoring: 10 points

Practice: Introduction to Stem-and-Leaf Plots
Research stem-and-leaf plots and back-to-back stem-and-leaf plots. Practice creating them.
Duration: 1 hr

Quiz: Stem-and-Leaf Plots
Answer questions about stem-and-leaf plots.
Duration: 0 hrs 50 mins Scoring: 10 points

Study: Histograms, and Making Them on the TI-83
See how histograms are related to stem-and-leaf plots. Create histograms on the TI-83 graphing calculator.
Duration: 1 hr

Practice: Histograms, and Making Them on the TI-83
Answer questions about how histograms are related to stem-and-leaf plots and about histograms on the TI-83 graphing calculator.
Duration: 0 hrs 30 mins

Discuss: Histograms
Discuss how best to display data with a histogram.
Duration: 0 hrs 30 mins Scoring: 10 points

Quiz: Identifying Shapes of Distributions
Answer questions about uniformly distributed distributions, bimodal distributions, symmetric and mound-shaped distributions, distributions skewed to the left or to the right, clusters, gaps, and outliers.
Duration: 1 hr Scoring: 10 points

LESSON 3: DESCRIBING DISTRIBUTIONS USING NUMBERS

Study: Populations and Samples, Parameters and Statistics
Examine the distinction between a population and a sample, and between a parameter and a statistic. Go over the basics of random sampling.
Duration: 0 hrs 50 mins

Practice: Populations and Samples, Parameters and Statistics
Answer questions about the distinction between a population and a sample, and between a parameter and a statistic.
Duration: 0 hrs 30 mins

Quiz: Populations, Samples, Parameters, Statistics
Answer questions about whether a given data set is a sample or a population and about whether a value is a statistic or a parameter.

**Duration**: 0 hrs 40 mins **Scoring**: 10 points

**Study: Measures of Central Tendency**
See how to calculate the three measures of center (the mean, the median, and the mode). Explore the strengths and weaknesses of each.

**Duration**: 0 hrs 50 mins

**Practice: Measures of Central Tendency**
Answer questions about how to calculate the three measures of center (the mean, the median, and the mode). Answer questions about the strengths and weaknesses of each.

**Duration**: 0 hrs 30 mins

**Practice: Differences Between Mean and Median**
Calculate means and medians for different distributions (some with outliers), and answer questions about the differences between them.

**Duration**: 1 hr 30 mins **Scoring**: 25 points

**Study: Measuring Variation**
Explore a technique for measuring variation: the standard deviation. Go over the distinction between the population standard deviation and the sample standard deviation.

**Duration**: 0 hrs 50 mins

**Practice: Measuring Variation**
Answer questions about a technique for measuring variation: the standard deviation, and the distinction between the population standard deviation and the sample standard deviation.

**Duration**: 0 hrs 30 mins

**Practice: Standard Deviation and Variance**
Calculate standard deviations and variances.

**Duration**: 1 hr 30 mins **Scoring**: 25 points

**LESSON 4: FIVE-NUMBER SUMMARIES**

**Study: Box-and-Whisker Plots and the Five-Number Summary**
Go over box-and-whisker plots and the five-number summary (minimum, \( Q1 \), median, \( Q3 \), and maximum). Learn the definition of **outlier**.

**Duration**: 0 hrs 50 mins

**Practice: Box-and-Whisker Plots and the Five-Number Summary**
Answer questions about box-and-whisker plots and the five-number summary (minimum, \( Q1 \), median, \( Q3 \), and maximum). Learn the definition of **outlier**.

**Duration**: 0 hrs 30 mins

**Quiz: Box-and-Whisker Plots and the Five-Number Summary**
Construct box-and-whisker plots and modified box-and-whisker plots. Answer questions about the minimum, \( Q1 \), median, \( Q3 \), maximum, and outliers.

**Duration**: 0 hrs 50 mins **Scoring**: 10 points

**Practice: Box-and-Whisker Plots and Modified Box-and-Whisker Plots on the TI-83**
See how to create a standard and modified box-and-whisker plots on the TI-83 and interpret the results.

**Duration**: 0 hrs 30 mins

**Practice: Working With Box-and-Whisker Plots**
Create multiple box-and-whisker plots on the TI-83 graphing calculator. Compare and contrast the distributions based on
these plots.
Duration: 1 hr 30 mins Scoring: 25 points

**LESSON 5: MORE ON DESCRIBING DISTRIBUTIONS**

**Practice: Averages in Skewed Data**
Graph skewed data on the TI-83 and calculate the mean and median. Repeat with a skewed left distribution.
Duration: 0 hrs 30 mins

**Quiz: Estimating Distribution Shape, Using Measures of Central Tendency**
Answer questions about how a sample can be used to estimate the shape of the distribution. See how to decide which measures of central tendency and variation are most appropriate to use with differently shaped distributions.
Duration: 1 hr Scoring: 10 points

**Practice: Changes in Units of Measurement**
Explore changes in measures of center and spread resulting from changes in unit (using conversions between Celsius and Fahrenheit).
Duration: 0 hrs 30 mins

**Practice: Distributions of Data**
Bring together terms and symbols for characterizing a distribution, write about characteristics of different distributions in these terms, and offer theories about why the distributions are shaped as they are.
Duration: 2 hrs Scoring: 25 points

**Quiz: Important Concepts From This Unit**
Answer questions to clarify your knowledge of some important concepts in statistics.
Duration: 1 hr Scoring: 15 points

**LESSON 6: WRAP-UP**

**Discuss: What Is Interesting? What Is Confusing?**
Discuss basic statistics, graphs, five-number summaries, distributions, and any concepts about which you are unclear.
Duration: 0 hrs 30 mins Scoring: 10 points

**Review: Describing Data**
Review your studies of basic statistics, graphs, five-number summaries, and distributions.
Duration: 3 hrs 30 mins

**Test (CS): Describing Data**
Take a test about the basics of statistics.
Duration: 0 hrs 20 mins Scoring: 48 points

**Test (TS): Describing Data**
Take a test about the basics of statistics.
Duration: 0 hrs 30 mins Scoring: 52 points

**LESSON 7: DIAGNOSTIC**

**Diagnostic: Describing Data**
Test your understanding of the key concepts covered.
Duration: 0 hrs 45 mins Scoring: 34 points
UNIT 2: THE NORMAL DISTRIBUTION

LESSON 1: INTRODUCTION TO THE NORMAL DISTRIBUTION

Discuss: Performance Comparisons
Discuss performance comparisons between two unrelated distributions, such as scoring averages in baseball and basketball. Show distributions for scoring averages in two sports.
Duration: 0 hrs 30 mins Scoring: 10 points

Study: The Normal Curve
Explore the characteristics and uses of one of the most important distributions in statistics: the bell-shaped (or normal) distribution.
Duration: 0 hrs 50 mins

Practice: The Normal Curve
Answer questions about the characteristics and uses of one of the most important distributions in statistics: the bell-shaped (or normal) distribution.
Duration: 0 hrs 30 mins

Brainbuilder: Properties of Normal Distributions
Manipulate graphs of normal curves and explore their properties. Change means and standard deviations to see the effect on the shape of the curve. Think of areas under the curve as proportions, relative frequencies, and probabilities.
Duration: 1 hr

Practice: RandNorm on the TI-83
Use the RandNorm function on a TI-83 to draw a sample. Store the data in a list, then create a histogram from the data and discuss whether the data appears “normal.”
Duration: 0 hrs 30 mins

LESSON 2: STANDARDIZED SCORES

Study: Raw and Standardized Scores
Explore the standard normal distribution. See how to find areas in a normal distribution and in a standard normal distribution.
Duration: 0 hrs 50 mins

Practice: Raw and Standardized Scores
Answer questions about the standard normal distribution. See how to find areas in a normal distribution and in a standard normal distribution.
Duration: 0 hrs 30 mins

Brainbuilder: x-Values and z-Scores
Manipulate graphs of normal curves to find areas, proportions, and probabilities.
Duration: 1 hr

Practice: Using a Normal Curve Table
Translate raw scores to percentiles and areas (and vice versa) using a normal distribution table.
Duration: 0 hrs 50 mins

Quiz: x-Values, z-Scores, and Areas on the TI-83
Answer questions that require you to convert normal distribution scores using the TI-83 graphing calculator.
Duration: 0 hrs 50 mins Scoring: 10 points

LESSON 3: DETERMINING IF A DATA SET IS NORMAL

Study: Checking a Data Set for Normalcy
See how to check for normalcy using either the empirical rule or a normal quantile plot. Also, see how to use a TI-83 to make a quantile plot.
Practice: Checking a Data Set for Normalcy
Answer questions about how to check for normalcy using either the empirical rule or a normal quantile plot. Also, see how to use a TI-83 to make a quantile plot.
Duration: 0 hrs 30 mins

Quiz: Empirical Rule and Quantile Plots
Answer questions about testing a data set for normalcy using the empirical rule and normal quantile plots.
Duration: 1 hr Scoring: 15 points

Practice: Checking for Normalcy
Use the empirical rule to determine if a given data set is normal. Use a TI-83 to do a normal quantile plot, and decide if it is close to a normal distribution.
Duration: 1 hr Scoring: 25 points

Quiz: Aspects of the Normal Distribution
Answer questions about terms and properties associated with the normal distribution.
Duration: 0 hrs 30 mins Scoring: 20 points

LESSON 4: WRAP-UP
Discuss: What Is Interesting? What Is Confusing?
Discuss the normal distribution, and any concepts about which you are unclear.
Duration: 0 hrs 30 mins Scoring: 10 points

Review: The Normal Distribution
Review your studies of the normal distribution.
Duration: 3 hrs 30 mins

Test (CS): The Normal Distribution
Take a test about the normal distribution.
Duration: 0 hrs 20 mins Scoring: 48 points

Test (TS): The Normal Distribution
Take a test about the normal distribution.
Duration: 0 hrs 30 mins Scoring: 52 points

LESSON 5: DIAGNOSTIC
Diagnostic: The Normal Distribution
Test your understanding of the key concepts covered.
Duration: 0 hrs 45 mins Scoring: 36 points

UNIT 3: BIVARIATE DATA

LESSON 1: INTRODUCTION TO BIVARIATE DATA
Discuss: Shoe Size vs. Height
Using data provided, plot shoe size and height to see if there’s a pattern. Discuss your findings.
Duration: 0 hrs 30 mins Scoring: 10 points

Practice: Scatterplots and Bivariate Data
Go over the distinction between categorical and quantitative variables. Create scatterplots and explore the distinction between the explanatory variable and the response variable.
Duration: 0 hrs 30 mins

LESSON 2: THE LEAST-SQUARES REGRESSION LINE
**Study: Least-Squares Regression Line**
Explore the least-squares regression line (a model for data that may be linearly associated).
Duration: 0 hrs 50 mins

**Practice: Least-Squares Regression Line**
Answer questions about the least-squares regression line (a model for data that may be linearly associated).
Duration: 0 hrs 30 mins

**Practice: Exploring LSR With the TI-83**
Use the TI-83 to explore the meaning of the least-squares regression and find lines of best fit. Learn about residuals and how to calculate them on the TI-83.
Duration: 0 hrs 50 mins

**Study: Residuals**
Explore residuals in linear regression and see how to compute them with a TI-83.
Duration: 0 hrs 50 mins

**Practice: Residuals**
Answer questions about residuals in linear regression and see how to compute them with a TI-83.
Duration: 0 hrs 30 mins

**Practice: Linear Regression Lines**
Given bivariate data, produce a scatterplot and produce a linear regression line and its residual plot by using the TI-83. Explain why a line is or is not a good model for the given data.
Duration: 0 hrs 50 mins Scoring: 25 points

**LESSON 3: THE CORRELATION COEFFICIENT**

**Study: Pearson: Correlation Coefficient**
Explore Pearson’s correlation coefficient. See what scatterplots look like for various r’s, and see how to obtain r on a TI-83. Examine the relationship between r and the slope of the regression line.
Duration: 0 hrs 50 mins

**Practice: Pearson: Correlation Coefficient**
Answer questions about Pearson’s correlation coefficient. See what scatterplots look like for various r’s, and see how to obtain r on a TI-83. Examine the relationship between r and the slope of the regression line.
Duration: 0 hrs 30 mins

**Discuss: Exploring Correlation Coefficient: r**
Use the TI-83 to explore correlation coefficients for different distributions. Move, create, and delete points to see the effects on Pearson’s r. Discuss your findings.
Duration: 0 hrs 30 mins Scoring: 10 points

**Practice: r on the TI-83**
Given some bivariate real-world data, use the TI-83 STAT functions to find the linear regression line and the correlation coefficient r.
Duration: 0 hrs 30 mins

**Study: The Meaning of r-Squared**
Explore r-squared (also called the coefficient of determination), which gives the proportion of the variation in a response variable that is explained by the explanatory variable.
Duration: 0 hrs 50 mins

**Practice: The Meaning of r-Squared**
Answer questions about r-squared (also called the coefficient of determination), which gives the proportion of the variation in a response variable that is explained by the explanatory variable.
Practice: Finding and Interpreting $r$ and $r$-Squared
Given some real-world bivariate data, use the TI-83 STAT functions to find the linear regression line, $r$, and $r$-squared. Explain the meaning of $r$, $r$-squared, and the slope of the regression line in the context of each problem.
Duration: 1 hr

Study: Uses of the Regression Line
Explore correlation, residual plots, and linear regression predictions. Examine the distinction between interpolation and extrapolation.
Duration: 0 hrs 50 mins

Practice: Uses of the Regression Line
Answer questions about correlation, residual plots, and linear regression predictions. Examine the distinction between interpolation and extrapolation.
Duration: 0 hrs 30 mins

Practice: Relation of Shoe Size to Height
Determine whether the correlation is strong for a data set. Calculate the $r$ and find the linear regression line—. Determine whether there is evidence that the variables are related.
Duration: 0 hrs 30 mins

Practice: Regression Lines and Bivariate Statistics
Given real-world bivariate data, use the TI-83 STAT functions to find the linear regression line and its slope. Explain and interpret the meaning of the slope (the regression coefficient). Explain the meaning of $r$ and $r$-squared.
Duration: 2 hrs Scoring: 25 points

Study: How to Read MINITAB Output
See how to read MINITAB output for scatterplots, linear regression lines, correlation coefficients and $r$-squared, residual plots, and other bivariate statistics.
Duration: 0 hrs 50 mins

Practice: How to Read MINITAB Output
Answer questions about how to read MINITAB output for scatterplots, linear regression lines, correlation coefficients and $r$-squared, residual plots, and other bivariate statistics.
Duration: 0 hrs 30 mins

Discuss: Correlation vs. Causation
Consider bivariate data sets (along with stories about how the data sets were gathered) and discuss whether the data sets may or may not show a cause-and-effect relationship.
Duration: 0 hrs 30 mins Scoring: 10 points

LESSON 4: INFLUENTIAL POINTS AND OUTLIERS

Study: Influential Points and Outliers
Explore the effects of outliers and influential points on a linear regression.
Duration: 0 hrs 50 mins

Practice: Influential Points and Outliers
Answer questions about the effects of outliers and influential points on a linear regression.
Duration: 0 hrs 30 mins

Practice: Bivariate Statistics and Outliers
Use the TI-83 to explore the effects of outliers on the least-squares line regression and on the correlation coefficient. Then use the TI-83 to explore a set of bivariate data.
Quiz: Aspects of Linear Regression
Answer questions about scatterplots, variables, linear regression, residuals, $r$, $r$-squared, outliers, influential points, interpolation, and extrapolation.
Duration: 0 hrs 50 mins Scoring: 15 points

**LESSON 5: TRANSFORMATIONS TO ACHIEVE LINEARITY**

**Study: Transformations to Achieve Linearity**
Explore data sets that are not linearly associated, and see how to transform the data in such sets to achieve linear association.
Duration: 0 hrs 50 mins

**Practice: Transformations to Achieve Linearity**
Answer questions about data sets that are not linearly associated, and see how to transform the data in such sets to achieve linear association.
Duration: 0 hrs 30 mins

**Practice: Transformations to Achieve Linearity**
Use the TI-83 STAT functions to practice the methods to straighten exponential, power, and logarithmic associations.
Duration: 1 hr 30 mins Scoring: 25 points

**Practice: Straightening Relationships**
Practice regression techniques.
Duration: 1 hr

**LESSON 6: CATEGORICAL BIVARIATE DATA: TWO-WAY TABLES**

**Discuss: Comparing Groups in a Table**
Discuss questions such as the following: Does a sports team perform better at home or away? Is there a relationship between education and military service?
Duration: 0 hrs 30 mins Scoring: 10 points

**Study: How to Interpret a Two-Way Table**
Examine marginal frequencies, row and column percents, and conditional distributions.
Duration: 0 hrs 50 mins

**Practice: How to Interpret a Two-Way Table**
Answer questions about marginal frequencies, row and column percents, and conditional distributions.
Duration: 0 hrs 30 mins

**Brainbuilder: Creating Two-Way Tables**
Use a data set to create a two-way table with row and column percents. Create joint frequencies and marginal frequencies and answer questions about the conclusions you can draw.
Duration: 1 hr

**Discuss: A Paradox**
Discuss how strange things can happen when data or statistics are combined.
Duration: 0 hrs 30 mins Scoring: 10 points

**Quiz: Simpson: Paradox and Confounding**
Answer questions about Simpson’s paradox.
Duration: 0 hrs 50 mins Scoring: 10 points

**LESSON 7: WRAP-UP**

**Discuss: What Is Interesting? What Is Confusing?**
Discuss bivariate data, the least-squares regression line, the correlation coefficient, influential points and outliers, categorical
bivariate data, two-way tables, and any concepts about which you are unclear.
Duration: 0 hrs 30 mins Scoring: 10 points

**Review: Bivariate Data: Regression Analysis and Two-Way Tables**
Review your studies of bivariate data.
Duration: 3 hrs 30 mins

**Test (CS): Bivariate Data**
Take a test about bivariate data.
Duration: 0 hrs 20 mins Scoring: 48 points

**Test (TS): Bivariate Data**
Take a test about bivariate data.
Duration: 0 hrs 30 mins Scoring: 52 points

**LESSON 8: DIAGNOSTIC**
**Diagnostic: Bivariate Data: Regression Analysis and Two-Way Tables**
Test your understanding of the key concepts covered.
Duration: 0 hrs 45 mins Scoring: 48 points

**UNIT 4: PLANNING A STUDY**

**LESSON 1: METHODS OF DATA COLLECTION--EXPERIMENTS AND STUDIES**

**Study: Vocabulary of Data Collection**
Explore data-collection terms and concepts such as sample, census, anecdotal evidence, available data, design for producing data, and observational study vs. experiment.
Duration: 0 hrs 50 mins

**Practice: Vocabulary of Data Collection**
Explore data-collection terms and concepts such as sample, census, anecdotal evidence, available data, design for producing data, and observational study vs. experiment.
Duration: 0 hrs 30 mins

**Quiz: Data Collection**
Answer questions about methods of data collection and state whether they will yield valid results. Differentiate between an observational study and an experiment.
Duration: 1 hr Scoring: 10 points

**Study: Vocabulary of Experiments and Surveys**
Explore experiment terminology and the three principles of experimental design.
Duration: 0 hrs 50 mins

**Practice: Vocabulary of Experiments and Surveys**
Explore experiment terminology and the three principles of experimental design.
Duration: 0 hrs 30 mins

**Practice: Aspects of Experiments**
Given an experimental design, identify terms associated with experiments. Identify elements of effective and flawed design.
Duration: 0 hrs 50 mins

**Quiz: Designs for Experiments**
Answer questions about completely randomized design vs. randomized match-paired design vs. randomized block design.
Duration: 1 hr 30 mins Scoring: 10 points

**Practice: Choosing the Design of an Experiment**
Design an experiment to test a given researchable issue.
Duration: 1 hr 30 mins Scoring: 25 points

LESSON 2: METHODS OF DATA COLLECTION--SURVEYS

Study: Types of Samples for Surveys
Explore the types of samples for surveys, including: simple random sample, census, stratified random sample, convenience sample, systematic sample and cluster sample, representative sample as opposed to a random sample, and self-selected sample.
Duration: 0 hrs 50 mins

Practice: Types of Samples for Surveys
Explore the types of samples for surveys, including: simple random sample, census, stratified random sample, convenience sample, systematic sample and cluster sample, representative sample as opposed to a random sample, and self-selected sample.
Duration: 0 hrs 30 mins

Practice: Generating Random Samples
Using the random number generator on a TI-83, randomly allocate subjects to two or more groups, so that the groups have equal size or their placement is independent.
Duration: 0 hrs 50 mins

Study: Bias in Surveys/Transition to Inference
Explore the types of bias in surveys, including the following: under-coverage, non-response, response bias, voluntary response, wording of a question, order of questions, and sampling bias.
Duration: 1 hr

Practice: Bias in Surveys/Transition to Inference
Explore the types of bias in surveys, including the following: under-coverage, non-response, response bias, voluntary response, wording of a question, order of questions, and sampling bias.
Duration: 0 hrs 30 mins

Quiz: Factors Causing Bias
Answer questions about the various causes of bias in observational studies and experiments.
Duration: 1 hr Scoring: 10 points

Quiz: Aspects of Studies
Answer questions about terms related to experimental and observational studies.
Duration: 1 hr Scoring: 10 points

LESSON 3: WRAP-UP

Discuss: What Is Interesting? What Is Confusing?
Discuss methods of data collection, including experiments, studies, and surveys, and any concepts about which you are unclear.
Duration: 0 hrs 30 mins Scoring: 10 points

Review: Planning a Study
Review your studies of methods of data collection.
Duration: 3 hrs 30 mins

Test (CS): Planning a Study
Take a test about methods of data collection.
Duration: 0 hrs 20 mins Scoring: 48 points

Test (TS): Planning a Study
Take a test about methods of data collection.
LESSON 4: DIAGNOSTIC

Diagnostic: Planning a Study
Test your understanding of the key concepts covered.
Duration: 0 hrs 45 mins Scoring: 34 points

UNIT 5: PROBABILITY

LESSON 1: WHAT IS PROBABILITY?

Study: Range of Probabilities
See that the range of probabilities is between 0 and 1, and that probabilities can be estimated from past events, from the theoretical definition of probability (equally likely outcomes), or from an intuition based on previous experience.
Duration: 0 hrs 50 mins

Practice: Range of Probabilities
See that the range of probabilities is between 0 and 1, and that probabilities can be estimated from past events, from the theoretical definition of probability (equally likely outcomes), or from an intuition based on previous experience.
Duration: 0 hrs 30 mins

Discuss: What Do You Mean by That?
Discuss which words denote what probabilities. Associate words like might, maybe, certain, probably, possibly, unlikely, and very likely with a single probability or a range of probabilities from 0 to 1.
Duration: 0 hrs 30 mins Scoring: 10 points

Practice: What Is Probability?
Consider probability in terms of relative frequencies. Look at examples and answer questions.
Duration: 0 hrs 30 mins

Quiz: Calculating Probabilities
Answer questions that require you to calculate probabilities from a given data set.
Duration: 0 hrs 50 mins Scoring: 10 points

LESSON 2: INTRODUCTION TO THE BASIC RULES OF PROBABILITY

Study: Concepts of Probability
Explore basic concepts of probability, such as sample space, outcome, and event.
Duration: 0 hrs 50 mins

Practice: Concepts of Probability
Explore basic concepts of probability, such as sample space, outcome, and event.
Duration: 0 hrs 30 mins

Quiz: Basic Concepts of Probability
Answer questions about the basic concepts of probability.
Duration: 1 hr Scoring: 10 points

Study: The Rules of Probability and an Introduction to Conditional Probability
Explore conditional probability, and learn some rules for solving probability problems.
Duration: 0 hrs 50 mins

Practice: The Rules of Probability and an Introduction to Conditional Probability
Explore conditional probability, and learn some rules for solving probability problems.
Duration: 0 hrs 30 mins

Practice: Using the Rules of Probability
Apply the rules for calculating conditional probabilities and the probabilities of combined events.
Duration: 1 hr 30 mins Scoring: 25 points

LESSON 3: MORE ON CONDITIONAL PROBABILITIES AND THE PROBABILITIES OF COMBINED EVENTS

Practice: Practice With Laws of Probability
Apply probability laws.
Duration: 1 hr

Study: Conditional Probabilities and Tree Diagrams
Explore conditional and combined probability using tree diagrams and two-way tables.
Duration: 0 hrs 50 mins

Practice: Conditional Probabilities and Tree Diagrams
Explore conditional and combined probability using tree diagrams and two-way tables.
Duration: 0 hrs 30 mins

Practice: Tree Diagrams and Probabilities
Use tree diagrams to find probabilities.
Duration: 1 hr

Quiz: Calculating Conditional Probabilities Graphically
Answer questions about conditional probability using tree-diagrams or two-way tables.
Duration: 1 hr Scoring: 10 points

LESSON 4: PROBABILITY DISTRIBUTIONS

Study: Random Variables: Discrete and Continuous
Explore random variables. Consider discrete vs. continuous random variables, and see how they're used in probability. Examine probability distributions for random variables, density curves, and see why \( P(x) = 0 \) for any individual number.
Duration: 0 hrs 50 mins

Practice: Random Variables: Discrete and Continuous
Explore random variables. Consider discrete vs. continuous random variables, and see how they're used in probability. Examine probability distributions for random variables, density curves, and see why \( P(x) = 0 \) for any individual number.
Duration: 0 hrs 30 mins

Practice: Discrete Probability Distributions
Use the TI-83 to do virtual random experiments (such as die rolls, coin flips, and candy samples) and see their histograms. Convert probability tables into histograms and vice versa. Create probability histograms from given facts.
Duration: 1 hr

Quiz: Aspects of Random Variables
Answer questions about discrete random variables, continuous random variables, density curves, probability distributions, and probability histograms.
Duration: 0 hrs 50 mins Scoring: 15 points

LESSON 5: MEANS AND VARIANCES OF RANDOM VARIABLES

Discuss: Dice Games
Given the rules of various dice games, rank them by which you'd prefer to play (from a statistical point of view). Discuss your ranking.
Duration: 0 hrs 30 mins Scoring: 10 points

Study: Mean and Variances of Random Variables
Go over expected value or expectation. Examine the rules for means and the effect of an \( a + bx \) transformation. Look at the rules for variances (and standard deviations).
Practice: Mean and Variances of Random Variables
Go over expected value or expectation. Examine the rules for means and the effect of an \( \sigma + bx \) transformation. Look at the rules for variances (and standard deviations).
Duration: 0 hrs 30 mins

Practice: Computing Means and Variances
Apply your knowledge of how to compute means and variances.
Duration: 1 hr Scoring: 25 points

Quiz: Games and Real-World Problems
Answer questions that require you to apply probability rules to problems and games.
Duration: 0 hrs 50 mins Scoring: 10 points

LESSON 6: REVIEW AND EXAM
Discuss: What Is Interesting? What Is Confusing?
Discuss probability, including conditional probabilities, probabilities of combined events, probability distributions, and means and variances of random variables, and any concepts about which you are unsure.
Duration: 0 hrs 30 mins Scoring: 10 points

Review: Probability
Review your studies of probability.
Duration: 3 hrs 30 mins

Review: AP Statistics
Review your studies of basic statistics.
Duration: 4 hrs

Exam: Probability
Take a test about basic statistics.
Duration: 0 hrs 55 mins Scoring: 100 points

Final Exam: Semester Exam
Take a test about basic statistics.
Duration: 0 hrs 55 mins Scoring: 100 points

LESSON 7: DIAGNOSTIC
Diagnostic: Probability
Test your understanding of the key concepts covered.
Duration: 0 hrs 45 mins Scoring: 39 points

UNIT 6: BINOMIALS AND DISTRIBUTIONS

LESSON 1: INTRODUCTION TO INFERENTIAL STATISTICS
Study: Introduction to Inferential Statistics
Explore an overview of intervals, significance, inference and various applications.
Duration: 0 hrs 50 mins

Practice: Introduction to Inferential Statistics
Explore an overview of intervals, significance, inference and various applications.
Duration: 0 hrs 30 mins

Discuss: Uses of Inferential Statistics
Discuss how and where you’ve seen inferential statistics used.
LESSON 2: BINOMIAL DISTRIBUTIONS

Study: Binomial Situations (Events)
Consider the definition of a binomial setting, and use the binomial calculations to solve problems. Examine binomial settings involving at least, at most, and between. Explore the TI-83 to do binomial problems.
Duration: 0 hrs 50 mins

Practice: Binomial Situations (Events)
Consider the definition of a binomial setting, and use the binomial calculations to solve problems. Examine binomial settings involving at least, at most, and between. Explore the TI-83 to do binomial problems.
Duration: 0 hrs 30 mins

Quiz: Binomial Settings and Binomial Probabilities
Solve binomial problems with and without the TI-83.
Duration: 1 hr Scoring: 10 points

Study: The Normal Approximation to the Binomial
Consider the normal approximation to the binomial distribution. Explore the cumbersome nature of calculating binomial probabilities exactly. Look at continuity correction.
Duration: 0 hrs 50 mins

Practice: The Normal Approximation to the Binomial
Consider the normal approximation to the binomial distribution. Explore the cumbersome nature of calculating binomial probabilities exactly. Look at continuity correction.
Duration: 0 hrs 30 mins

Quiz: Binomial Problems
Work on binomial problems and consider the criteria for using the normal approximation. Compare answers obtained with the normal approximation to the binomial to those obtained with the exact binomial.
Duration: 1 hr Scoring: 10 points

Practice: Binomial Problems Using Two Methods
Work on binomial, individual, and interval problems using both the normal approximation to the binomial and, on the TI-83, the exact binomial.
Duration: 1 hr Scoring: 25 points

LESSON 3: GEOMETRIC DISTRIBUTION

Discuss: When Are You Most Likely to Get Your First Red Candy?
Discuss average waiting-time problems.
Duration: 0 hrs 30 mins Scoring: 10 points

Study: Geometric Probability Distributions
Look at geometric distributions. These are skewed distributions modeling the probability of getting doubles before a certain roll of dice, or the average waiting-time to get a certain answer to a polling question.
Duration: 0 hrs 50 mins

Practice: Geometric Probability Distributions
Look at geometric distributions. These are skewed distributions modeling the probability of getting doubles before a certain roll of dice, or the average waiting-time to get a certain answer to a polling question.
Duration: 0 hrs 30 mins

Quiz: Geometric Distribution Problems
Consider geometric distribution problems with and without the TI-83.
Duration: 1 hr Scoring: 10 points
LESSON 4: SAMPLING DISTRIBUTIONS: MEANS AND PROPORTIONS

Discuss: Which Is More Likely?
Consider the question, "Which is more likely, that the next person you see will be taller than 6' 6 or that the next five people you see will have an average height above 6' 6?"
Duration: 0 hrs 30 mins Scoring: 10 points

Study: Sampling Distributions and the Central Limit Theorem
Go over sampling distributions and the sampling distribution of a sample mean. Study the mean and standard deviation of the sampling distribution of the mean. Explore the Central Limit Theorem.
Duration: 0 hrs 50 mins

Practice: Sampling Distributions and the Central Limit Theorem
Go over sampling distributions and the sampling distribution of a sample mean. Study the mean and standard deviation of the sampling distribution of the mean. Explore the Central Limit Theorem.
Duration: 0 hrs 30 mins

Practice: Sampling Distributions
Practice using the Central Limit Theorem to predict the means, standard deviations, and shapes of sampling distributions.
Duration: 1 hr

Practice: Sampling Distributions
Use the TI-83 to create sampling distributions. Calculate their means and standard deviations.
Duration: 1 hr Scoring: 25 points

Study: Sample Proportions
Look at the derivation of the mean and standard deviation of a sample proportion, based on the binomial.
Duration: 0 hrs 50 mins

Practice: Sample Proportions
Look at the derivation of the mean and standard deviation of a sample proportion, based on the binomial.
Duration: 0 hrs 30 mins

Practice: Sampling Distribution of p-Hat
Work on problems based on the mean and standard deviation of a sampling distribution of \( \hat{p} \)-hat. Get additional practice dealing with the sampling distribution of means.
Duration: 1 hr Scoring: 25 points

Quiz: Important Concepts From This Unit
Review the concepts of sampling distribution, the Central Limit Theorem, and sampling distributions for the sample mean and \( \hat{p} \)-hat.
Duration: 1 hr Scoring: 10 points

LESSON 5: UNIT WRAP-UP

Discuss: What Is Interesting? What Is Confusing?
Discuss concepts you find interesting or confusing in an informal setting.
Duration: 0 hrs 30 mins Scoring: 10 points

Review: Binomial Situations and Sampling Distributions
Review your studies of binomial situations and sampling distributions.
Duration: 3 hrs 30 mins

Test (CS): Binomial Situations and Sampling Distributions
Take a 20-minute test covering inferential statistics, binomial distributions, geometric distribution, and means and proportions.
Duration: 0 hrs 20 mins Scoring: 48 points
Test (TS): Binomial Situations and Sampling Distributions
Take a 30-minute test covering inferential statistics, binomial distributions, geometric distribution, and means and proportions.
Duration: 0 hrs 30 mins Scoring: 52 points

LESSON 6: DIAGNOSTIC
Diagnostic: Binomial Situations and Sampling Distributions
Test your understanding of the key concepts covered.
Duration: 0 hrs 45 mins Scoring: 31 points

UNIT 7: INTRODUCTION TO INFERENCE

LESSON 1: CONFIDENCE INTERVALS FOR MEANS
Discuss: Guessing an Estimate
Discuss how comfortable you are with guessing numbers within certain intervals. As the intervals widen, does your comfort level increase?
Duration: 0 hrs 30 mins Scoring: 10 points

Study: Using Sample Means to Estimate Population Means
Consider how to estimate the mean of a population using a sample. Examine confidence intervals and the general form of a confidence interval. Find critical $z$-values for various confidence levels by using tables and the TI-83 InvNorm function.
Duration: 0 hrs 50 mins

Practice: Using Sample Means to Estimate Population Means
Consider how to estimate the mean of a population using a sample. Examine confidence intervals and the general form of a confidence interval. Find critical $z$-values for various confidence levels by using tables and the TI-83 InvNorm function.
Duration: 0 hrs 30 mins

Quiz: Confidence Intervals
Estimate population means, creating 95% and 99% confidence $z$-intervals for means. Find critical $z$-values for non-standard confidence levels.
Duration: 1 hr Scoring: 10 points

Practice: Confidence Intervals
Build an understanding of the term statistical confidence.
Duration: 1 hr

Quiz: Finding Desired Sample Sizes
Look at how to find the desired sample size to create a $z$-interval with a given margin of error and confidence level. Consider the relationship between sample size, confidence level, and margin of error.
Duration: 1 hr Scoring: 10 points

Practice: Creating Intervals
Create intervals for means using the formula and the TI-83 STAT TESTS function. Calculate the sample size $n$ necessary to produce a given margin of error and a certain confidence level.
Duration: 1 hr Scoring: 25 points

LESSON 2: STATISTICAL SIGNIFICANCE AND P-VALUE
Discuss: How Good Is the Guess?
Discuss the following scenario: A psychic says she knows what time of day you were born. She tells you her guess and she’s right! How would you quantify how good her guess is?
Duration: 0 hrs 30 mins Scoring: 10 points

Study: The Definition of P-Value
Explore the concepts of statistical significance and significance levels. Consider what it means to say that a finding is different
enough from what was expected that we can reject it as chance variation.

Duration: 0 hrs 50 mins

Practice: The Definition of P-Value
Explore the concepts of statistical significance and significance levels. Consider what it means to say that a finding is different enough from what was expected that we can reject it as chance variation.

Duration: 0 hrs 30 mins

Quiz: Working With P-Values and Statistical Significance
Find P-values for different distributions. Determine statistical significance.

Duration: 1 hr Scoring: 10 points

LESSON 3: SIGNIFICANCE AND HYPOTHESIS TESTING: MEANS
Discuss: What Is an Impressive Prediction?
Look at cases where people make successful predictions. How do you know whether the successful prediction was just luck?

Duration: 0 hrs 30 mins Scoring: 10 points

Study: The Hypothesis-Testing Procedure
Look at the hypothesis-testing procedure and null and alternative hypotheses. Consider one- and two-sided hypotheses, and how to compute a P-value.

Duration: 0 hrs 50 mins

Practice: The Hypothesis-Testing Procedure
Look at the hypothesis-testing procedure and null and alternative hypotheses. Consider one- and two-sided hypotheses, and how to compute a P-value.

Duration: 0 hrs 30 mins

Practice: Hypothesis Tests for Means
Perform hypothesis tests for means and then support the conclusion.

Duration: 1 hr

Practice: More Hypothesis Tests for Means
Apply your knowledge of significance and hypothesis testing to answer the questions in this Assignment.

Duration: 1 hr Scoring: 25 points

Study: Two-Sided Significance Tests and Confidence Intervals
Consider the relationship between two-tailed significance tests and confidence intervals. See examples of how a confidence interval for means can solve a two-tailed significance test for means.

Duration: 0 hrs 50 mins

Practice: Two-Sided Significance Tests and Confidence Intervals
Consider the relationship between two-tailed significance tests and confidence intervals. See examples of how a confidence interval for means can solve a two-tailed significance test for means.

Duration: 0 hrs 30 mins

Quiz: Two-Sided Significance Tests and Confidence Intervals
Work on parallel problems: a confidence interval and its corresponding significance test. Observe that the same conclusions are reached with each method.

Duration: 1 hr Scoring: 10 points

LESSON 4: ERRORS IN HYPOTHESIS TESTING
Discuss: Innocent or Guilty?
Discuss the following scenario: A person is on trial. If your hypothesis is that the person is innocent, what kinds of errors can you make if you declare the person guilty or innocent?

Duration: 0 hrs 30 mins Scoring: 10 points
Study: The Power of the Test, Type I and Type II Errors
Look at two types of errors in hypothesis testing. Consider several concepts, including the power of a test, the relationship between significance level and a Type I error, and the relationship between power and a Type II error.
Duration: 0 hrs 50 mins

Practice: The Power of the Test, Type I and Type II Errors
Look at two types of errors in hypothesis testing. Consider several concepts, including the power of a test, the relationship between significance level and a Type I error, and the relationship between power and a Type II error.
Duration: 0 hrs 30 mins

Practice: Dangers of Type I and Type II Errors
Look at various situations and determine the dangers inherent in making Type I and Type II errors.
Duration: 1 hr

Practice: Computing Probabilities for Type I and Type II Errors
Look at hypothesis-testing situations and compute the probabilities of Type I errors, Type II errors, and the power of the test. Emphasis is on the concepts of errors and power rather than on computation, although some computation will be done.
Duration: 1 hr  Scoring: 25 points

Quiz: Concepts of Hypothesis and Significance Testing
Test of your understanding of concepts such as point estimate, \( P \)-value, null hypothesis, alternative hypothesis, statistical significance, result, conclusion, one-tailed, two-tailed, Type I and Type II errors.
Duration: 1 hr  Scoring: 10 points

LESSON 5: UNIT WRAP-UP
Discuss: What Is Interesting? What Is Confusing?
Discuss concepts you find interesting or confusing in an informal setting.
Duration: 0 hrs 30 mins  Scoring: 10 points

Review: Introduction to Inference: Confidence Intervals and Hypothesis Testing
Review your studies of confidence intervals and hypothesis testing.
Duration: 3 hrs 30 mins

Test (CS): Introduction to Inference
Take a 20-minute test covering confidence intervals for means, statistical significance and \( P \)-value, means, and errors in hypothesis testing.
Duration: 0 hrs 20 mins  Scoring: 48 points

Test (TS): Introduction to Inference
Take a 30-minute test covering confidence intervals for means, statistical significance and \( P \)-value, means, and errors in hypothesis testing.
Duration: 0 hrs 30 mins  Scoring: 52 points

LESSON 6: DIAGNOSTIC
Diagnostic: Introduction to Inference: Confidence Intervals and Hypothesis Testing
Test your understanding of the key concepts covered.
Duration: 0 hrs 45 mins  Scoring: 36 points

UNIT 8: T DISTRIBUTION FOR MEANS
LESSON 1: CONFIDENCE INTERVALS AND HYPOTHESIS TESTING FOR A SINGLE MEAN
Study: The t Distributions
Examine what to do when you don't know the population standard deviation. Look at the important assumptions necessary to use the \( t \) distribution and notice how to use the \( t \) tables and the TI-83 for the \( t \) distribution.
Duration: 0 hrs 50 mins

Practice: The t Distributions
Examine what to do when you don’t know the population standard deviation. Look at the important assumptions necessary to use the t distribution and notice how to use the t tables and the TI-83 for the t distribution.
Duration: 0 hrs 30 mins

Practice: Creating Confidence Intervals
Create 90%, 95%, and 99% confidence t intervals for means. Practice doing this using the TI-83.
Duration: 1 hr

Quiz: Concepts Relating to Confidence t Intervals
Create t intervals for means using the formula and the TI-83 STAT TESTS function. Calculate the sample size n needed to produce a given margin of error and a certain confidence level.
Duration: 1 hr Scoring: 10 points

Practice: Hypothesis Testing With the t Distribution
Follow the steps for conducting hypothesis tests (both one- and two-sided) using the t distribution. Consider the relationship between confidence intervals and significance tests. Look at power and Type I and Type II errors.
Duration: 1 hr

Practice: t Intervals and Hypothesis Tests
Apply the calculations for t intervals and hypothesis tests from start to finish using realistic data sets. Justify use of the t procedures.
Duration: 1 hr Scoring: 25 points

LESSON 2: CONFIDENCE INTERVALS FOR THE DIFFERENCE BETWEEN TWO MEANS

Study: Inference for Matched-Pairs Situations
Look at when data should and should not be analyzed as a matched-pairs situation. Explore the hypothesis-testing procedures and t intervals for matched-pairs data.
Duration: 0 hrs 50 mins

Practice: Inference for Matched-Pairs Situations
Look at when data should and should not be analyzed as a matched-pairs situation. Explore the hypothesis-testing procedures and t intervals for matched-pairs data.
Duration: 0 hrs 30 mins

Quiz: Matched Pairs or Not?
Identify situations in which it’s appropriate to use matched-pairs analysis.
Duration: 1 hr Scoring: 10 points

Practice: t Intervals and Hypothesis Tests With Matched Pairs Data
Look at how to use TI-83 LISTS and STAT TESTS to create confidence intervals and to conduct hypothesis tests for paired data.
Duration: 1 hr

Quiz: Matched Pairs Confidence Intervals and t Tests
Solve problems using matched-pairs t tests.
Duration: 1 hr Scoring: 10 points

LESSON 3: CONFIDENCE INTERVALS AND HYPOTHESIS TESTS FOR TWO INDEPENDENT SAMPLES

Study: t Intervals for Two Independent Samples
Use t intervals for two independent samples, and compute degrees of freedom using the conservative method, the software method, and pooled variances.
Duration: 0 hrs 50 mins
Practice: t Intervals for Two Independent Samples
Use t intervals for two independent samples, and compute degrees of freedom using the conservative method, the software method, and pooled variances.
Duration: 0 hrs 30 mins

Quiz: t Intervals for Two Independent Samples
Compute and interpret t intervals for two independent samples.
Duration: 1 hr Scoring: 10 points

Practice: t Intervals for Two Independent Samples
Practice techniques taught in this lesson. Create 90%, 95%, and 99% confidence t intervals for mean differences when the population standard deviation is unknown. Use a table to produce critical t values.
Duration: 1 hr Scoring: 25 points

Study: Hypothesis Test for the Difference of Two Independent Samples
Look at how to do significance testing for the difference of two independent samples. Compare different methods for computing degrees of freedom, including the conservative method, pooling variances, and software.
Duration: 0 hrs 50 mins

Practice: Hypothesis Test for the Difference of Two Independent Samples
Look at how to do significance testing for the difference of two independent samples. Compare different methods for computing degrees of freedom, including the conservative method, pooling variances, and software.
Duration: 0 hrs 30 mins

Quiz: Two-Sample t Tests
Work on two-sample t tests using the formula, tables, and the TI-83. Compare results using different degrees of freedom.
Duration: 1 hr Scoring: 10 points

Practice: More Two-Sample t Tests
Work on two-sample t tests for means, using the formula and tables. Solve the same problems using confidence intervals.
Duration: 1 hr

Quiz: Confidence Intervals and Significance Testing for Means
Test your understanding of various significance tests. Review uses of confidence intervals.
Duration: 1 hr Scoring: 10 points

LESSON 4: UNIT WRAP-UP

Discuss: What Is Interesting? What Is Confusing?
Discuss concepts you find interesting or confusing in an informal setting.
Duration: 0 hrs 30 mins Scoring: 10 points

Review: t Distribution for Means
Review your studies of t distribution for means.
Duration: 3 hrs 30 mins

Test (CS): t Distribution for Means
Take a 20-minute test covering confidence intervals and hypothesis testing for a single mean and for two independent samples, and the difference between two means.
Duration: 0 hrs 20 mins Scoring: 48 points

Test (TS): t Distribution for Means
Take a 30-minute test covering confidence intervals and hypothesis testing for a single mean and for two independent samples, and the difference between two means.
Duration: 0 hrs 30 mins Scoring: 52 points
LESSON 5: DIAGNOSTIC

Diagnostic: t Distribution for Means
Test your understanding of the key concepts covered.
Duration: 0 hrs 45 mins Scoring: 37 points

UNIT 9: INFERENCE FOR PROPORTIONS

LESSON 1: CONFIDENCE INTERVALS AND HYPOTHESIS TESTS FOR A SINGLE POPULATION PROPORTION

Study: Confidence Interval for a Single Population Proportion
Look at confidence intervals for a single population proportion and sample size for a given margin of error.
Duration: 0 hrs 50 mins

Practice: Confidence Interval for a Single Population Proportion
Look at confidence intervals for a single population proportion and sample size for a given margin of error.
Duration: 0 hrs 30 mins

Practice: Creating z-Intervals for a Single Population Proportion
Create 90%, 95%, and 99% z-intervals for problems using the formula and table or the InvNorm function on the TI-83.
Duration: 1 hr

Quiz: Finding the Sample Size for a Given Margin of Error for a Single Population Proportion
Practice finding the sample size for a given margin of error.
Duration: 1 hr Scoring: 10 points

Practice: Confidence Intervals for a Single Population Proportion
Apply various techniques to solve problems and create intervals for proportions using the formula and the TI-83 STAT TESTS function. Calculate the sample size \( n \) needed to produce a given confidence interval.
Duration: 1 hr Scoring: 25 points

Study: Significance Testing for Proportions
Examine one- and two-tailed significance-testing problems.
Duration: 0 hrs 50 mins

Practice: Significance Testing for Proportions
Examine one- and two-tailed significance-testing problems.
Duration: 0 hrs 30 mins

Practice: One- and Two-Tailed Significance Tests for a Single Population Proportion
Perform one- and two-tailed significance tests for proportions. Work on parallel problems: a confidence interval for proportions and its corresponding two-tailed significance test. Justify that the conclusions match.
Duration: 1 hr

Quiz: More One- and Two-Tailed Significance Tests for a Single Population Proportion
Perform one- and two-tailed significance tests for proportions.
Duration: 1 hr Scoring: 10 points

LESSON 2: THE DIFFERENCE BETWEEN TWO PROPORTIONS

Study: Differences Between Two Proportions
Look at confidence intervals and significance testing for the difference between two proportions. Compare differences in computation of standard error. Study how to use the TI-83 to test for a difference between two proportions.
Duration: 0 hrs 50 mins

Practice: Differences Between Two Proportions
Look at confidence intervals and significance testing for the difference between two proportions. Compare differences in computation of standard error. Study how to use the TI-83 to test for a difference between two proportions.
**Practice: Differences Between Two Proportions**
Create 90%, 95%, and 99% confidence intervals and do significance tests for the differences between proportions.
Duration: 1 hr Scoring: 25 points

**Practice: Significance Tests for One and Two Proportions**
Choose confidence intervals and do significance tests on one- and two-proportion problems.
Duration: 1 hr

**Quiz: Inference for Means and Proportions**
Identify elements of confidence intervals or significance tests needed in a variety of situations.
Duration: 1 hr Scoring: 10 points

**LESSON 3: UNIT WRAP-UP**

**Discuss: What Is Interesting? What Is Confusing?**
Discuss concepts you find interesting or confusing in an informal setting.
Duration: 0 hrs 30 mins Scoring: 10 points

**Review: Inference for Proportions**
Review your studies of inference for proportions.
Duration: 3 hrs 30 mins

**Test (CS): Inference for Proportions**
Take a 20-minute test covering confidence intervals and hypothesis tests for a single population proportion and the difference between two proportions.
Duration: 0 hrs 20 mins Scoring: 48 points

**Test (TS): Inference for Proportions**
Take a 30-minute test covering confidence intervals and hypothesis tests for a single population proportion and the difference between two proportions.
Duration: 0 hrs 30 mins Scoring: 52 points

**LESSON 4: DIAGNOSTIC**

**Diagnostic: Inference for Proportions**
Test your understanding of the key concepts covered.
Duration: 0 hrs 45 mins Scoring: 34 points

**UNIT 10: INFERENCE FOR TABLES AND LEAST-SQUARES**

**LESSON 1: ONE-WAY TABLES: CHI-SQUARE FOR GOODNESS-OF-FIT**

**Discuss: Roll of the Die**
Discuss the following scenario: You’re given the results of a single die rolled 60 times: how many ones, twos, threes, and so on came up? Try to decide if the die is fair. (How far can outcomes deviate from what’s expected by chance alone?)
Duration: 0 hrs 30 mins Scoring: 10 points

**Study: Chi-Square for Goodness-of-Fit**
Explore inference for univariate categorical data. Look at the chi-square statistic and the chi-square distribution, how to use them to test whether data fit expected values, and the assumptions needed to use the chi-square statistic.
Duration: 0 hrs 50 mins

**Practice: Chi-Square for Goodness-of-Fit**
Explore inference for univariate categorical data. Look at the chi-square statistic and the chi-square distribution, how to use them to test whether data fit expected values, and the assumptions needed to use the chi-square statistic.
Duration: 0 hrs 30 mins
Practice: Goodness-of-Fit on the TI-83
Use the lists on the TI-83 to compute a chi-square value for goodness-of-fit.
Duration: 1 hr

Quiz: Using Chi-Square for Goodness-of-Fit
Perform chi-square significance tests involving goodness-of-fit on problems involving dice, spinners, birthdays in different months, and the like.
Duration: 1 hr Scoring: 10 points

LESSON 2: TWO-WAY TABLES: CHI-SQUARE FOR ASSOCIATION OR INDEPENDENCE

Study: Expected Values as an Ideal for Independence
Study inference for bivariate categorical data in two-way tables. Look at the chi-square test for association or independence and the assumptions needed to use the test.
Duration: 0 hrs 50 mins

Practice: Expected Values as an Ideal for Independence
Study inference for bivariate categorical data in two-way tables. Look at the chi-square test for association or independence and the assumptions needed to use the test.
Duration: 0 hrs 30 mins

Practice: Chi-Square Hypothesis Tests for Association or Independence
Perform complete chi-square hypothesis tests for association or independence. Look at the assumptions needed to use chi-square.
Duration: 1 hr Scoring: 25 points

LESSON 3: INFERENCE FOR THE LEAST-SQUARES LINE

Study: Inference for the Least-Squares Line
Explore the linear regression line for a sample as an estimator of the least-square line for a population. Study and use the standard error of the slope, and the \( t \) test for the slope of a regression line.
Duration: 0 hrs 50 mins

Practice: Inference for the Least-Squares Line
Explore the linear regression line for a sample as an estimator of the least-square line for a population. Study and use the standard error of the slope, and the \( t \) test for the slope of a regression line.
Duration: 0 hrs 30 mins

Quiz: \( t \) Test for the Slope of the Regression Line
Choose a linear regression line from paired data as an estimate of the population regression line. Do \( t \) tests for the slope of the regression line.
Duration: 1 hr Scoring: 10 points

Practice: TI-83 and MINITAB Output for Inference for the Least-Squares Line
Practice doing a \( t \) test on your TI-83 for the slope of the regression line. Look at how to read MINITAB output for regression.
Duration: 1 hr

Practice: Inference for the Least-Squares Line
Given paired data, do a hypothesis test for the slope of the regression line using the TI-83. Read MINITAB output for regression and use this for a hypothesis test for the slope of the regression line.
Duration: 1 hr Scoring: 25 points

LESSON 4: UNIT WRAP-UP

Discuss: What Is Interesting? What Is Confusing?
Discuss concepts you find interesting or confusing in an informal setting.
Duration: 0 hrs 30 mins Scoring: 10 points
Review: Inference for One- and Two-Way Tables and for Least-Squares Lines
Review your studies of inference for one- and two-way tables and for least square lines.
Duration: 3 hrs 30 mins

Test (CS): Inference for Tables and Least-Squares
Take a 20-minute test covering one-way tables, two way tables, and inference for the least-squares line.
Duration: 0 hrs 20 mins Scoring: 48 points

Test (TS): Inference for Tables and Least-Squares
Take a 30-minute test covering one-way tables, two way tables, and inference for the least-squares line.
Duration: 0 hrs 30 mins Scoring: 52 points

LESSON 5: DIAGNOSTIC
Diagnostic: Inference for One- and Two-Way Tables and for Least-Squares Lines
Test your understanding of the key concepts covered.
Duration: 0 hrs 45 mins Scoring: 35 points

UNIT 11: FINAL PREPARATION FOR THE AP STATISTICS EXAM

LESSON 1: GENERAL PREPARATION STRATEGIES
Study: How to Prepare for the AP Statistics Exam
Study how to assess where you are in your preparations for the Exam, and plan how to best prepare based on your self-assessment.
Duration: 0 hrs 50 mins

Practice: Action Plan
Write an action plan for preparing for the AP Statistics Exam.
Duration: 1 hr Scoring: 25 points

Discuss: Statistics as a Cohesive Whole
Create a map that ties together the concepts covered in the statistics course. Discuss an example of how statistics is used, and list the most important concepts from the statistics course used in your example.
Duration: 1 hr Scoring: 10 points

Quiz: Interpreting MINITAB Output
Review how MINITAB or other software packages may be used on the AP Exam.
Duration: 2 hrs Scoring: 10 points

LESSON 2: STRATEGIES AND PRACTICE FOR MULTIPLE-CHOICE AND FREE-RESPONSE QUESTIONS
Quiz: AP-Style Multiple-Choice Questions, Part 1
Practice answering AP-style multiple-choice questions.
Duration: 2 hrs 30 mins Scoring: 20 points

Practice: AP-Style Free-Response Practice, Part 1
Practice with AP-style free-response questions and study how they are scored.
Duration: 2 hrs Scoring: 20 points

Quiz: AP-Style Multiple-Choice Questions, Part 2
Practice Answering AP-style multiple-choice questions.
Duration: 2 hrs 30 mins Scoring: 20 points

Practice: AP-Style Free-Response Practice, Part 2
More practice with AP-style free-response questions.
Duration: 2 hrs 30 mins
LESSON 3: PUTTING IT TOGETHER: PRACTICE EXAM AND MIXED PRACTICE

Practice: Full-Length Practice Exam
Take a full-length practice exam and study how AP Exams are scored by scoring yourself.
Duration: 5 hrs Scoring: 25 points

Practice: Mixed Practice with Multiple-Choice and Free-Response Questions
Answer items similar to the practice exam (the format is different and you don't need to do it in one sitting).
Duration: 5 hrs

Study: Final Wrap-Up for AP Exam
Take note of some things to think about on the Exam. Apply some final preparation suggestions.
Duration: 0 hrs 50 mins

LESSON 4: FINAL EXAM

Exam: AP Statistics
Take the Final Exam. Good luck!
Duration: 1 hr 30 mins Scoring: 80 points

Final Exam: AP Statistics
Take the Final Exam. Good Luck!
Duration: 1 hr 30 mins Scoring: 112 points

LESSON 1: TEST-TAKING TIPS