AP Statistics - MA5188	Scope and Sequence
Unit Lesson	**Objectives**
Data Analysis	
Introduction to AP Statistics	
Introduction to Unit 1	
Introduction to Statistics	
	Identify an individual from a set of data.
	Identify a variable from a set of data.
	Classify a variable as categorical, discrete quantitative, or continuous quantitative.
Reading Lesson Introduction	
Categorical Data Displays	
	Identify a frequency table and a relative frequency table given data.
	Determine if a graphical display is appropriate for a given data set.
	Interpret a bar graph or pie chart.
	Determine what makes a graph of categorical data deceptive.
Reading Lesson 1.1, Part 1	
Relative Frequencies	
	Complete a two-way table, and calculate marginal and conditional distributions.
	Given a two-way table, calculate marginal and joint relative frequency distributions.
	Given a two-way table, calculate conditional relative frequency distributions.
	Create marginal relative frequency distributions.
	Create conditional relative frequency distributions.
	Interpret frequencies appropriately when given data from samples that differ considerably in sample size for two categorical variables.

AP Statistics - MA5188		Scope and Sequence
Unit	**Lesson**	**Objectives**
	Reading Lesson 1.1, Part 2	
	Comparing Two Categorical Variables	
		Compare distributions of categorical data using segmented or side-by-side bar graphs.
		Decide whether two categorical variables are associated using segmented or side-by-side bar graphs.
		Use appropriate phrasing in the depth and detail required by the College board to compare and contrast categorical variables.
		Display three categorical variables in side-by-side bar graphs.
	Reading Lesson 1.1, Part 3	
	Describing and Comparing Data with Dotplots and Stemplots	
		Identify and/or describe a dotplot.
		Identify and/or describe a stemplot.
		Compare two distributions using dotplots or stemplots.
	Reading Lesson 1.2, Part 1	
	Describing and Comparing Data with Histograms	
		Identify the patterns, shape, and spread of a distribution using histograms.
		Relate measures of center to the shape of a distribution using histograms.
		Compare two distributions using histograms.
	Reading Lesson 1.2, Part 2	
	Measures of Center and Location	
		Calculate measures of center, given a data set or a graphical display.
		Interpret the measures of center.
		Analyze the effect of extreme values on the value of the mean and median.

AP Statistics - MA5188		Scope and Sequence
Unit	Lesson	Objectives
		Analyze the relationship between center and shape.
	Reading Lesson 1.3, Part 1	
	Measures of Variability	
		Calculate the range, standard deviation, or interquartile range of a univariate data set.
		Interpret the range, standard deviation, or interquartile range of a univariate data set.
		Compare the spread given graphical displays of two univariate data sets.
		Use a graphing calculator to compute the numerical summary of a univariate data set.
	Reading Lesson 1.3, Part 2	
	Boxplots and Outliers	
		Identify if a univariate data set contains any outliers.
		Represent univariate data using a boxplot.
		Compare distributions presented in parallel boxplots.
		Identify the percent and number of values lying in each portion of a boxplot.
		Create a boxplot using a graphing calculator.
	Reading Lesson 1.3, Part 3	
	The AP Statistics Exam: Multiple-Choice and Free-Response Sections	
	Unit 1 Test	
		Classify variables as categorical, discrete quantitative, or continuous quantitative.
		Interpret a bar graph or pie chart.
		Given a two-way table, calculate marginal and joint relative frequency distributions.
		Given a two-way table, calculate conditional relative frequency distributions.
		Decide whether two categorical variables are associated using segmented or side-by-side bar graphs.

AP Statistics - MA5188		Scope and Sequence
Unit	Lesson	Objectives
		Identify and/or describe a dotplot.
		Identify and/or describe a stemplot.
		Compare two distributions using dotplots or stemplots.
		Identify patterns, shape, and spread of a distribution using histograms.
		Relate measures of center to shape of a distribution using histograms.
		Compare two distributions using histograms.
		Interpret the measures of center.
		Analyze the effect of extreme values on the value of the mean and median.
		Analyze the relationship between center and shape.
		Calculate/interpret the range, standard deviation, or interquartile range of a univariate data set.
		Compare the spread given graphical displays of two univariate data sets.
		Identify if a univariate data set contains any outliers.
		Compare distributions presented in parallel box plots.
The Normal Distribution		
	Introduction to Unit 2	
	Describing Location within a Distribution	
		Calculate the percentile for individual values in a quantitative data set.
		Interpret the percentile for individual values in a quantitative data set.
		Estimate the percentile of a value given a cumulative relative frequency graph.
	Reading Lesson 2.1, Part 1	
	Calculating and Interpreting z-Scores	
		Calculate a z-score.

AP Statistics - MA5188		Scope and Sequence
Unit	**Lesson**	**Objectives**
		Interpret a z-score.
		Compare performance using two or more z-scores.
		Calculate a data value given a z-score, standard deviation, and mean.
		Compare performance using three or more z-scores.
	Reading Lesson 2.1, Part 2	
	Effect of Linear Transformations	
		Describe the center, shape, and spread of a distribution whose values have been transformed by adding or subtracting a constant value.
		Describe the center, shape, and spread of a distribution whose values have been transformed by multiplying or dividing by a constant value.
		Describe the center, shape, and spread of a distribution whose values have been transformed by a combination of addition or subtraction and by multiplying or dividing by a constant value.
	Reading Lesson 2.1, Part 3	
	Uniform Density Curves	
		Describe a density curve.
		Calculate probabilities using the appropriate area within a uniform density curve.
		Estimate the mean and median value of a density curve.
	Reading Lesson 2.2, Part 1	
	Normal Distributions	
		Describe the properties of a Normal distribution.
		Describe a Normal distribution using the empirical rule.
		Calculate probabilities using the empirical rule.
	Reading Lesson 2.2, Part 2	
	Finding Areas within a Normal	

AP Statistics - MA5188	Scope and Sequence
Unit Lesson	Objectives
Distribution	
	Estimate the proportion of values in a Normal distribution to the left of a value or to the right of a value using a Normal distribution table.
	Estimate the proportion of values in a Normal distribution between two values using a Normal distribution table.
	Estimate the proportion of values in a Normal distribution for inclusive intervals of less than or equal to, greater than or equal to, or between and including values.
	Estimate the proportion of values in a Normal distribution using a graphing calculator.
	Estimate the proportion of values in a standard Normal distribution using a graphing calculator.
Reading Lesson 2.2, Part 3	
Finding Values from Probabilities	
	Determine the z-score for a given probability.
	Determine the data-value, x, in a Normal distribution for a given percentile.
	Determine the value in a Normal distribution that bounds a given area, using a graphing calculator.
Reading Lesson 2.2, Part 4	
Assessing Normality	
	For a set of quantitative data, decide if the distribution is approximately Normal using graphical evidence.
	For a set of quantitative data, decide if the distribution is approximately Normal using numerical evidence.
	For a set of quantitative data, decide if the distribution is approximately Normal using a Normal probability plot.
Reading Lesson 2.2, Part 5	
Unit 2 AP Practice Free-Response Questions	
Unit 2 Test	
	Calculate the percentile for individual values in a quantitative data set.

Unit	Lesson	Objectives
		Interpret the percentile for individual values in a quantitative data set.
		Interpret a z-score.
		Compare performance using two or more z-scores.
		Calculate a data value given a z-score, standard deviation, and mean.
		Describe the center, shape and spread of a distribution whose values have been transformed by adding or subtracting a constant value.
		Describe the center, shape and spread of a distribution whose values have been transformed by multiplying or dividing by a constant value.
		Describe the center, shape, and spread of a distribution whose values have been transformed by a combination of addition or subtraction and by multiplying or dividing by a constant value.
		Describe a density curve. Estimate the mean and median value of a density curve.
		Calculate probabilities using the appropriate area within a uniform density curve.
		Describe the properties of a normal distribution.
		Calculate probabilities using the empirical rule.
		Estimate the proportion of values in a Normal distribution to the left of a value or to the right of a value using a Normal distribution table.
		Estimate the proportion of values in a Normal distribution between two values using a Normal distribution table.
		Estimate the proportion of values in a Normal distribution for inclusive intervals of less than or equal to, greater than or equal to, or between and including values.
		Estimate the proportion of values in a Normal distribution using a graphing calculator.
		Determine the z-score for a given probability.
		For a set of quantitative data, decide if the distribution is approximately Normal using graphical evidence.
		For a set of quantitative data, decide if the distribution is approximately Normal using numerical evidence.
		For a set of quantitative data, decide if the distribution is approximately Normal using a Normal probability plot.

AP Statistics - MA5188	Scope and Sequence
Unit Lesson	**Objectives**
Simple Linear Regression	
Introduction to Unit 3	
The Relationship between Two Quantitative Variables	
	Identify the explanatory and response variable.
	Represent two quantitative variables using a scatterplot.
	Describe the direction, form, strength, and unusual observations given a scatterplot.
	Create a scatterplot using a graphing calculator.
Reading Lesson 3.1, Part 1	
Correlation	
	Interpret the correlation of a linear relationship between two quantitative variables.
	Describe the effect of unusual observations on the correlation.
	Distinguish between correlation and causation.
Reading Lesson 3.1, Part 2	
Making Predictions from a Least-Squares Regression Line	
	Interpret the slope and y-intercept of a linear model.
	Make a prediction using a linear model.
Reading Lesson 3.2, Part 1	
Calculating the Least-Squares Regression Line	
	Explain why the line that is the best fit for a linear relationship is called the least-squares regression line.
	Compute a least-squares regression line and correlation using technology.
	Identify a least-squares regression line using computer output.

AP Statistics - MA5188		Scope and Sequence
Unit	Lesson	Objectives
	Reading Lesson 3.2, Part 2	
	Residuals	
		Calculate residuals.
		Create a residual plot.
		Assess linearity based upon a residual plot.
		Create a residual plot on the graphing calculator.
	Reading Lesson 3.2, Part 3	
	R-squared and s	
		Determine r^2 using a graphing calculator or computer output.
		Interpret r^2 and s in context.
		Identify s.
		Describe the effect that influential points have on the least-squares regression line.
	Reading Lesson 3.2, Part 4	
	Calculating a Least-Squares Regression Line from Summary Statistics	
		Calculate the slope of a least-squares regression line from summary statistics.
		Calculate the y-intercept of a least-squares regression line from summary statistics.
		Write the equation of a least-squares regression line from summary statistics.
	Reading Lesson 3.2, Part 5	
	Transforming to Achieve Linearity	
		Transform a nonlinear data set using powers, roots, or logarithms.
		Write the equation of a least-squares regression line that describes a transformed data set given computer output.

AP Statistics - MA5188	Scope and Sequence
Unit Lesson	Objectives
	Predict the response variable based upon the equation of a least-squares regression line that describes a transformed data set.
Reading Lesson 3.3, Part 1	
Choosing the Best Model	
	Assess how well a model fits a given data set.
	Choose an appropriate model for a bivariate data set given regression output and residual plots.
	Make a prediction based on the computer output provided for various regression models.
Reading Lesson 3.3, Part 2	
Unit 3 AP Practice Free-Response Questions	
Unit 3 Test	
	Identify the explanatory and response variable. Represent two quantitative variables using a scatterplot.
	Describe the direction, form, strength, and unusual observations given a scatterplot.
	Interpret the correlation of a linear relationship between two quantitative variables.
	Describe the effect of unusual observations on the correlation.
	Distinguish between correlation and causation.
	Interpret the slope and y-intercept of a linear model.
	Make a prediction using a linear model.
	Explain why the line that is the best fit for a linear relationship is called the least-squares regression line.
	Identify a least-squares regression line using computer output.
	Calculate residuals.
	Assess linearity based upon a residual plot.
	Determine r^2 using a graphing calculator or computer output.

AP Statistics - MA5188		Scope and Sequence
Unit	Lesson	Objectives
		Describe the effect that influential points have on the least-squares regression line.
		Write the equation of a least-squares regression line from summary statistics
		Write the equation of a least-squares regression line that describes a transformed data set given computer output.
		Choose an appropriate model for a bivariate data set given regression output and residual plots.
		Make a prediction based on computer output provided for various regression models.
		Interpret r^2 and s in context. Identify s.
Sampling and Experimentation		
	Introduction to Unit 4	
	Introduction to Sampling Methods	
		Describe a population and sample given a description of a study.
		Identify whether a study utilized convenience sampling or voluntary response sampling.
		Analyze a study to determine if bias is present and whether that bias leads to an overestimate or underestimate of the population parameter.
	Reading Lesson 4.1, Part 1	
	Simple Random Sample	
		Describe the process of simple random sampling.
		Explain the process of generating a simple random sample using a table of random digits.
		Explain the process of generating a simple random sample using a random number generator.
	Reading Lesson 4.1, Part 2	
	Other Sampling Methods	
		Describe the process and/or advantages and disadvantages of stratified random sampling.
		Describe the process and/or advantages and disadvantages of systematic random sampling.

AP Statistics - MA5188		Scope and Sequence
Unit	Lesson	Objectives
		Describe the process and/or advantages and disadvantages of cluster sampling.
		Distinguish between stratified random sampling, systematic random sampling, and cluster sampling.
	Reading Lesson 4.1, Part 3	
	Considerations When Sampling	
		Describe the sampling problems of undercoverage, nonresponse, response, and question-wording bias.
		Identify whether a study is affected by undercoverage, nonresponse, response, or question-wording bias.
		Describe the direction of the bias presented in a study.
	Reading Lesson 4.1, Part 4	
	Sampling Project	
	Observational Studies and Experiments	
		Distinguish between an observational study and an experiment.
		Describe the effect of confounding.
		Identify the explanatory variable, response variable, treatments, experimental units/subjects, factors, and levels of an experimental design.
	Reading Lesson 4.2, Part 1	
	Additional Principles of Experimental Design	
		Identify the benefits of using the principle of comparison within an experimental design.
		Identify the placebo effect, as well as the benefits of blindness, within an experimental design.
		Identify the benefits of using the principle of random assignment within an experimental design.
		Identify the benefits of using the principle of control and replication within an experimental design.
	Reading Lesson 4.2, Part 2	
	How to Experiment Well	

AP Statistics - MA5188		Scope and Sequence
Unit	**Lesson**	**Objectives**
		Identify the reason for randomization for a well-constructed experimental design.
		Describe the randomization step within an experimental design using slips of paper.
		Describe the randomization step within an experimental design using a table of random digits.
		Describe the randomization step within an experimental design using a random number generator.
	Reading Lesson 4.2, Part 3	
	Experimental Designs	
		Describe the structure of a completely randomized design, including details about the randomization process.
		Describe the structure of a randomized block design, including details about the randomization process.
		Describe the structure of the matched pairs version of a randomized block design, including details about the randomization process.
	Reading Lesson 4.2, Part 4	
	Scope of Inference	
		Describe the concept of sampling variability with regards to the size of the sample.
		Determine if the results of an experiment are statistically significant based upon simulated results.
		Determine the appropriate scope of inference for the study design used.
	Reading Lesson 4.3	
	Unit 4 AP Practice Free-Response Questions	
	Unit 4 Test	
		Identify whether a study utilized convenience sampling or voluntary response sampling.
		Analyze a study to determine if bias is present and whether that bias leads to an over or underestimate of the population parameter.
		Describe the process of simple random sampling.
		Describe the process and/or advantages and disadvantages of stratified random sampling.

AP Statistics - MA5188	Scope and Sequence
Unit Lesson	**Objectives**
	Describe the process and/or advantages and disadvantages of cluster sampling.
	Distinguish between stratified random sampling, systematic random sampling, and cluster sampling.
	Describe the sampling problems of undercoverage, nonresponse, response, and question wording bias.
	Identify whether a study is affected by undercoverage, nonresponse, response, or question wording bias.
	Distinguish between an observational study and an experiment.
	Describe the effect of confounding.
	Identify the explanatory variable, response variable, treatments, experimental units/subjects, the factors and the levels of an experimental design.
	Identify the placebo effect, as well as the benefits of blindness within an experimental design.
	Identify the benefits of using the principle of control and replication within an experimental design.
	Identify the reason for randomization for a well-constructed experimental design.
	Describe the randomization step within an experimental design using slips of paper.
	Describe the randomization step within an experimental design using a random number generator.
	Describe the structure of a randomized block design, including details about the randomization process.
	Describe the structure of the matched pairs version of a randomized block design, including details about the randomization process.
	Determine the appropriate scope of inference for the study design used.
Probability	
Introduction to Unit 5	
Introduction to Probability	
	Interpret probability as the long-run relative frequency of an event.
	Describe the law of large numbers.
	Describe how a simulation is used to imitate a random process.

AP Statistics - MA5188	Scope and Sequence
Unit **Lesson**	**Objectives**
	Conduct a simulation using a graphing calculator.
Reading Lesson 5.1	
Probability Rules	
	Identify a probability model to describe a random process.
	Apply the basic probability rules, which indicate that the probability of an event is a number between 0 and 1 and that the sum of the probabilities of all outcomes in the sample space is 1.
	Apply the complement rule and the addition rule for mutually exclusive events.
Reading Lesson 5.2, Part 1	
Applying Probability Rules	
	Determine probabilities using a two-way table.
	Determine probabilities using a Venn diagram.
Reading Lesson 5.2, Part 2	
Conditional Probabilities	
	Calculate a conditional probability.
	Interpret a conditional probability.
	Determine if two events are independent.
Reading Lesson 5.3, Part 1	
The Multiplication Rule for Dependent Events	
	Calculate a probability using the general multiplication rule.
	Use a tree diagram to determine the sample space.
	Calculate a probability using a tree diagram.
Reading Lesson 5.3, Part 2	

AP Statistics - MA5188	Scope and Sequence
Unit Lesson	**Objectives**
The Multiplication Rule for Independent Events	
	Calculate a probability using the multiplication rule for independent events.
	Calculate the probability of "at least one" using the multiplication rule for independent events or other multi-step probabilities.
	Determine if it is appropriate to use the multiplication rule for independent events, the addition rule for mutually exclusive events, or neither.
Reading Lesson 5.3, Part 3	
Unit 5 AP Practice Free-Response Questions	
Unit 5 Test	
	Interpret probability as the long-run relative frequency of an event.
	Describe the law of large numbers.
	Describe how a simulation is used to imitate a random process.
	Simulate chance behavior.
	Create a probability model to describe a random process.
	Apply the basic probability rules which indicate that the probability of an event is a number between 0 and 1 and that the sum of the probabilities all outcomes in the sample space is 1.
	Apply the complement rule and the addition rule for mutually exclusive events
	Determine probabilities using a two-way table.
	Determine probabilities using a Venn diagram.
	Calculate a conditional probability.
	Interpret a conditional probability.
	Determine if two events are independent.
	Calculate a probability using the general multiplication rule.

AP Statistics - MA5188		Scope and Sequence
Unit	**Lesson**	**Objectives**
		Identify a tree diagram
		Calculate a probability using a tree diagram.
		Calculate a probability using the multiplication rule for independent events.
		Calculate the probability of "at least one" using the multiplication rule for independent events and other multi-step probabilities.
		Determine if it is appropriate to use the multiplication rule for independent events, the addition rule for mutually exclusive events, or neither.
Random Variables		
	Introduction to Unit 6	
	Introduction to Random Variables	
		Calculate the probability of an event given a probability distribution of a discrete random variable.
		Interpret the probability of an event given a probability distribution of a discrete random variable.
		Identify a probability distribution histogram of a discrete random variable.
		Describe the shape of a probability distribution histogram of a discrete random variable.
	Reading Lesson 6.1, Part 1	
	Discrete Random Variables – Mean	
		Calculate the mean, median, and/or standard deviation of the probability distribution of a discrete random variable.
		Interpret the standard deviation of the probability distribution of a discrete random variable.
		Compare the shape, center, and/or variability given two probability distribution histograms.
	Reading Lesson 6.1, Part 2	
	Continuous Random Variables	
		Distinguish between a discrete and a continuous random variable.
		Calculate a probability or value for a uniform random variable.

AP Statistics - MA5188		Scope and Sequence
Unit	**Lesson**	**Objectives**
		Determine the mean of a uniform random variable.
		Calculate a probability or value for a Normal random variable.
	Reading Lesson 6.1, Part 3	
	Transforming Random Variables	
		Calculate the measures of center and variability of a transformed random variable.
		Interpret the mean and standard deviation of a transformed random variable.
		Calculate a probability of a value within the distribution of a transformed random variable.
	Reading Lesson 6.2, Part 1	
	Combining Two Random Variables	
		Calculate the mean and standard deviation of the sum or difference of two or more random variables.
		Interpret the mean and standard deviation of the sum or difference of two or more random variables.
		Calculate a probability based upon the sum or difference of two or more random variables.
		Calculate the mean and standard deviation of a linear combination of random variables.
	Reading Lesson 6.2, Part 2	
	Binomial Random Variables	
		Determine if a scenario describes a binomial setting.
		Calculate the mean and standard deviation of a binomial random variable.
		Describe the shape, center, and/or variability of a probability histogram of a binomial random variable.
	Reading Lesson 6.3, Part 1	
	Binomial Probabilities	
		Calculate the binomial probability $P(X = k)$ using the binomial probability formula.
		Calculate cumulative binomial probabilities using the binomial probability formula.

AP Statistics - MA5188		Scope and Sequence
Unit	**Lesson**	**Objectives**
		Approximate binomial probabilities using a Normal distribution.
		Calculate the binomial probability P(X = k) using a graphing calculator.
		Calculate cumulative binomial probabilities using a graphing calculator.
	Reading Lesson 6.3, Part 2	
	Geometric Random Variables	
		Determine if a scenario describes a geometric setting.
		Calculate a geometric probability using the geometric probability formula.
		Calculate the mean and standard deviation of a geometric random variable.
		Calculate a geometric probability using a graphing calculator.
	Reading Lesson 6.3, Part 3	
	Unit 6 AP Practice Free-Response Questions	
	Unit 6 Test	
		Calculate the probability of an event given a probability distribution of a discrete random variable.
		Calculate the mean, median, and/or standard deviation of the probability distribution of a discrete random variable.
		Interpret the standard deviation of the probability distribution of a discrete random variable.
		Calculate a probability or value for a Normal random variable.
		Calculate the mean and standard deviation of a transformed random variable.
		Interpret the mean and standard deviation of a transformed random variable.
		Calculate a probability of a value within the distribution of a transformed random variable.
		Calculate the mean and standard deviation of the sum or difference of two or more random variables.
		Interpret the mean and standard deviation of the sum or difference of two or more random variables.

Unit	Lesson	Objectives
		Calculate a probability based upon the sum or difference of two or more random variables.
		Calculate the mean and standard deviation of a binomial random variable.
		Calculate binomial probabilities using the binomial probability formula.
		Calculate the binomial probability $P(X = k)$ using a graphing calculator.
		Calculate cumulative binomial probabilities using a graphing calculator.
		Calculate the mean and standard deviation of a geometric random variable.
		Calculate a geometric probability using a graphing calculator.
Cumulative Exam 1		
	Cumulative Exam	
Sampling Distributions		
	Introduction to Unit 7	
	Introduction to Sampling Distributions	
		Identify the population, parameter, sample, and statistic given a scenario.
		Identify a sampling distribution.
		Distinguish between the population distribution, sample distribution, and a sampling distribution of a statistic.
	Reading Lesson 7.1, Part 1	
	Sampling Distributions – Center and Variability	
		Evaluate a claim about a population parameter based upon a sampling distribution of a statistic.
		Determine if a sample statistic is an unbiased estimator of the population parameter.
		Describe the variability of a sampling distribution as it relates to the size of the sample.
	Reading Lesson 7.1, Part 2	
	Sampling Distribution of the Sample	

AP Statistics - MA5188	Scope and Sequence
Unit **Lesson**	**Objectives**
Proportion	
	Determine the shape, mean, and/or standard deviation of the sampling distribution of the sample proportion.
	Determine the shape, mean, and/or standard deviation of the sampling distribution of the difference in two sample proportions.
	Interpret the standard deviation of the sampling distribution of the sample proportion or the sampling distribution of the difference in two sample proportions.
Reading Lesson 7.2, Part 1	
Calculating Probabilities for Sampling Distribution	
	Calculate a probability based upon the sampling distribution of p-hat.
	Calculate a probability based upon the sampling distribution of p-hat1 – p-hat2.
	Determine if there is convincing evidence against a claim based upon a calculated probability.
Reading Lesson 7.2, Part 2	
Sampling Distribution of the Sample Mean	
	Describe the shape of the sampling distribution of the sample mean.
	Describe the shape, mean, and/or standard deviation of the sampling distribution of the sample mean.
	Describe the shape, mean, and/or standard deviation of the sampling distribution of the difference in two sample means.
Reading Lesson 7.3, Part 1	
Using the Central Limit Theorem	
	Calculate probabilities given a Normal population based upon the sampling distribution of the sample mean or difference in sample means.
	Calculate probabilities given a non-Normal population, when appropriate, based upon the sampling distribution of the sample mean or difference in sample means.
Reading Lesson 7.3, Part 2	

AP Statistics - MA5188		Scope and Sequence
Unit	Lesson	Objectives
	Unit 7 AP Practice Free-Response Questions	
	Unit 7 Test	
		Identify the population, parameter, sample, and statistic given a scenario.
		Identify a sampling distribution.
		Distinguish between the population distribution, sample distribution, and a sampling distribution of a statistic.
		Evaluate a claim about a population parameter based upon a sampling distribution of a statistic.
		Determine if a sample statistic is an unbiased estimator of the population parameter.
		Describe the variability of a sampling distribution as it relates to the size of the sample.
		Determine the shape, mean and/or standard deviation of the sampling distribution of the sample proportion.
		Determine the shape, mean and/or standard deviation of the sampling distribution of the difference in two sample proportions.
		Interpret the standard deviation of the sampling distribution of the sample proportion or the sampling distribution of the difference in two sample proportions.
		Calculate a probability based upon the sampling distribution of p-hat.
		Calculate a probability based upon the sampling distribution of p-hat1 – p-hat2.
		Determine if there is convincing evidence against a claim based upon a calculated probability.
		Describe the shape of the sampling distribution of the sample mean.
		Describe the shape, mean and/or standard deviation of the sampling distribution of the sample mean.
		Describe the shape, mean and/or standard deviation of the sampling distribution of the difference in two sample means.
		Calculate probabilities given a normal population based upon the sampling distribution of the sample mean or difference in sample means.
		Calculate probabilities given a non-normal population, when appropriate, based upon the sampling distribution of the sample mean or difference in sample means.

AP Statistics - MA5188	Scope and Sequence
Unit Lesson	**Objectives**
Estimating Proportions with Confidence	
Introduction to Unit 8	
Introduction to Confidence Intervals	
	Calculate the value of a point estimate and/or the margin of error of a given confidence interval.
	Interpret a confidence interval.
	Evaluate a claim about a population parameter given a confidence interval.
Reading Lesson 8.1, Part 1	
More about Confidence Intervals	
	Interpret the confidence level.
	Determine how the margin of error and width of the interval is affected by the confidence level and sample size.
	Identify the sources of variability that are and are not accounted for by the margin of error in a confidence interval.
Reading Lesson 8.1, Part 2	
Preparing to Estimate a Population Proportion	
	Verify if each of the conditions for calculating a confidence interval for a population proportion are met.
	Determine the critical value for a specific confidence level for a population proportion using a table and technology.
	Calculate the point estimate and standard error of the sample proportion.
Reading Lesson 8.2, Part 1	
Estimating a Population Proportion	
	Construct a confidence interval for a population proportion.
	Evaluate a claim about a population proportion based upon a calculated confidence interval.

AP Statistics - MA5188		Scope and Sequence
Unit	**Lesson**	**Objectives**
		Calculate the minimum sample size that is needed to construct a confidence interval for a population proportion with a given confidence level and a given margin of error.
	Reading Lesson 8.2, Part 2	
	Estimating the Difference between Two Population Proportions	
		Determine whether the conditions for calculating a confidence interval for a difference in two population proportions are met.
		Construct a confidence interval for a difference in two population proportions.
		Evaluate a claim about a difference in two population proportions based upon a calculated confidence interval.
		Construct a confidence interval for a difference in two population proportions using a graphing calculator.
	Reading Lesson 8.3	
	Unit 8 AP Practice Free-Response Questions	
	Unit 8 Test	
		Calculate the value of a point estimate and/or the margin of error of a given confidence interval.
		Interpret a confidence interval.
		Evaluate a claim about a population parameter given a confidence interval.
		Interpret the confidence level.
		Determine how the margin of error and width of the interval is affected by the confidence level and sample size.
		Identify the sources of variability that are and are not accounted for by the margin of error in a confidence interval.
		Verify if each of the conditions for calculating a confidence interval for a population proportion are met.
		Determine the critical value for a specific confidence level for a population proportion using a table and technology.
		Calculate the point estimate and standard error of the sample proportion.

AP Statistics - MA5188		Scope and Sequence
Unit	Lesson	Objectives
		Construct a confidence interval for a population proportion.
		Evaluate a claim about a population proportion based upon a calculated confidence interval.
		Calculate the minimum sample size that is needed to construct a confidence interval for a population proportion with a given confidence level and a given margin of error.
		Construct a confidence interval for a population proportion using a graphing calculator
		Determine whether the conditions for calculating a confidence interval for a difference in two population proportions are met.
		Construct a confidence interval for a difference in two population proportions.
		Evaluate a claim about a difference in two population proportions based upon a calculated confidence interval.
		Construct a confidence interval for a difference in two population proportions using a graphing calculator.
Testing Claims about Proportions		
	Introduction to Unit 9	
	Introduction to Hypothesis Testing	
		State appropriate hypotheses for performing a hypothesis test about a population proportion.
		Interpret the P-value.
		Draw a conclusion based upon the P-value.
	Reading Lesson 9.1, Part 1	
	Type I and Type II Errors	
		Describe and give a consequence of a Type I and Type II error.
		Estimate a P-value based upon the results of a simulation.
		Draw a conclusion based upon an estimated P-value.
	Reading Lesson 9.1, Part 2	
	Preparing to Test a Claim about a Population Proportion	

AP Statistics - MA5188	Scope and Sequence
Unit Lesson	**Objectives**
	Determine if the conditions needed to carry out a significance test about a population proportion are met.
	Calculate the test statistic and the P-value for a significance test about a population proportion.
	Draw a conclusion based upon a calculated P-value.
Reading Lesson 9.2, Part 1	
Testing a Claim about a Population Proportion	
	Conduct a hypothesis test about a population proportion.
	Conduct a hypothesis test about a population proportion given computer output.
	Describe the power of a test and/or what influences the power of a test.
	Calculate a test statistic and P-value for a hypothesis test about a population proportion using a graphing calculator.
Reading Lesson 9.2, Part 2	
Testing a Claim about a Difference between Proportions	
	Perform one step of a hypothesis test for a difference in two population proportions.
	Conduct a hypothesis test about a difference in two population proportions.
	Calculate a test statistic and P-value for a hypothesis test about a population proportion using a graphing calculator.
Reading Lesson 9.3	
Unit 9 AP Practice Free-Response Questions	
Unit 9 Test	
	State appropriate hypotheses for performing a hypothesis test about a population proportion.
	Interpret the P-value.
	Draw a conclusion based upon the P-value.

AP Statistics - MA5188	Scope and Sequence
Unit Lesson	**Objectives**
	Describe and give a consequence of a Type I and Type II error.
	Estimate a P-value based upon the results of a simulation.
	Draw a conclusion based upon an estimated P-value.
	Determine if the conditions needed to carry out a hypothesis test about a population proportion are met.
	Calculate the test statistic and the P-value for a hypothesis test about a population proportion.
	Draw a conclusion based upon a calculated P-value.
	Conduct a hypothesis test about a population proportion.
	Conduct a hypothesis test about a population proportion given computer output.
	Describe the power of a test and/or what influences the power of a test.
	Calculate a test statistic and P-value for a hypothesis test about a population proportion using a graphing calculator.
	Perform one step of a hypothesis test for a difference in two population proportions.
	Conduct a hypothesis test about a difference in two population proportions.
	Calculate a test statistic and P-value for a hypothesis test about a difference in two population proportions using a graphing calculator.
Estimating Means with Confidence	
Introduction to Unit 10	
Preparing to Estimate a Population Mean	
	Determine the t critical value needed to compute a C% confidence interval for a population mean.
	Determine if the conditions required to compute a C% confidence interval for a population mean are met.
	Calculate the standard error of the mean.
	Interpret the standard error of the mean.
Reading Lesson 10.1, Part 1	

AP Statistics - MA5188		Scope and Sequence
Unit	Lesson	Objectives
	Estimating a Population Mean	
		Construct a confidence interval for a population mean.
		Evaluate a claim about a population mean based upon a calculated confidence interval.
		Describe how the margin of error of a confidence interval can be reduced.
		Construct a confidence interval for a population mean using a graphing calculator.
	Reading Lesson 10.1, Part 2	
	Estimating a Difference in Two Population Means	
		Determine if the conditions required to compute a confidence interval for a difference in two population means are met.
		Construct a confidence interval for a difference in two population means.
		Evaluate a claim about the difference in the population means based upon a calculated confidence interval.
		Construct a confidence interval for a difference in two population means using a graphing calculator.
	Reading Lesson 10.2, Part 1	
	Estimating the Mean Difference	
		Calculate the mean difference and the standard deviation of the differences for paired data.
		Construct a confidence interval for a mean difference.
		Evaluate a claim about a population mean difference based upon a confidence interval.
		Construct a confidence interval for a mean difference using a graphing calculator.
	Reading Lesson 10.2, Part 2	
	Unit 10 AP Practice Free-Response Questions	
	Unit 10 Test	
		Determine the t critical value needed to compute a C% confidence interval for a population mean.

AP Statistics - MA5188	Scope and Sequence
Unit **Lesson**	**Objectives**
	Determine if the conditions required to compute a C% confidence interval for a population mean are met.
	Calculate the standard error of the mean.
	Interpret the standard error of the mean.
	Construct a confidence interval for a population mean.
	Evaluate a claim about a population mean based upon a calculated confidence interval.
	Describe how the margin of error of a confidence interval can be reduced.
	Determine if the conditions required to compute a confidence interval for a difference in two population means are met.
	Construct a confidence interval for a difference in two population means.
	Evaluate a claim about the difference in the population means based upon a calculated confidence interval.
	Calculate the mean difference and the standard deviation of the differences for paired data.
	Construct a confidence interval for a mean difference.
	Evaluate a claim about a population mean difference based upon a confidence interval.
Testing Claims about Means	
Introduction to Unit 11	
Preparing to Test a Claim about a Mean	
	State appropriate hypotheses for performing a hypothesis test about a population mean.
	Determine if the conditions needed to carry out a hypothesis test about a population mean are satisfied.
	Calculate the test statistic and the P-value for a hypothesis test about a population mean.
	Draw a conclusion based upon a calculated P-value.
Reading Lesson 11.1, Part 1	
Testing a Claim about a Population Mean	

AP Statistics - MA5188		Scope and Sequence
Unit	Lesson	Objectives
		Conduct a hypothesis test about a population mean.
		Interpret the P-value.
		Identify and give a consequence of a Type I and Type II error.
		Calculate a test statistic and P-value for a hypothesis test about a population mean using a graphing calculator.
	Reading Lesson 11.1, Part 2	
	Significance Tests and Confidence Intervals	
		State a conclusion about a significance test for a population mean based upon a confidence interval.
		Describe the power of a test and/or what influences the power of a test.
	Reading Lesson 11.1, Part 3	
	Testing a Claim about a Difference between Means	
		Perform one step of a significance test for a difference in two population means.
		Conduct a significance test about a difference in two population means.
		Calculate a test statistic and P-value for a significance test about a difference in two population means using a graphing calculator.
	Reading Lesson 11.2, Part 1	
	Testing a Claim about a Mean Difference	
		Perform one step of a hypothesis test for a mean difference.
		Conduct a hypothesis test about a mean difference.
		Calculate a test statistic and P-value for a hypothesis test about a mean difference using a graphing calculator.
	Reading Lesson 11.2, Part 2	
	Choosing the Appropriate Inference	

AP Statistics - MA5188	Scope and Sequence
Unit **Lesson**	**Objectives**
Procedure	
	Distinguish between one sample, two samples, and paired data.
	Determine the appropriate inference procedure.
Reading Lesson 11.2, Part 3	
Statistical Inference Project	
Unit 11 AP Practice Free-Response Questions	
Unit 11 Test	
	State appropriate hypotheses for performing a hypothesis test about a population mean.
	Determine if the conditions needed to carry out a hypothesis test about a population mean are satisfied.
	Calculate the test statistic and the P-value for a hypothesis test about a population mean.
	Draw a conclusion based upon a calculated P-value.
	Conduct a hypothesis test about a population mean.
	Interpret the P-value.
	Identify and give a consequence of a Type I and Type II error.
	State a conclusion about a hypothesis test for a population mean based upon a confidence interval.
	Describe the power of a test and/or what influences the power of a test.
	Perform one step of a hypothesis test for a difference in two population means.
	Conduct a hypothesis test about a difference in two population means.
	Perform one step of a hypothesis test for a mean difference.
	Conduct a hypothesis test about a mean difference.
	Distinguish between one sample, two samples, and paired data.
	Determine the appropriate inference procedure.

AP Statistics - MA5188	Scope and Sequence
Unit Lesson	**Objectives**
Inference for Distributions and Relationships	
Introduction to Unit 12	
Preparing to Conduct a Chi-Square Test for Goodness of Fit	
	State the hypotheses for a chi-square test for goodness of fit.
	Determine if the conditions for a chi-square test for goodness of fit are met.
	Calculate the chi-square test statistic and P-value.
	Calculate the chi-square P-value using technology.
Reading Lesson 12.1, Part 1	
Conducting a Chi-Square Test for Goodness of Fit	
	Perform a chi-square test for goodness of fit given a distribution of equally likely outcomes.
	Perform a chi-square test for goodness of fit given a distribution with claimed proportions.
	Perform a follow-up analysis to investigate how an observed distribution differs from the hypothesized distribution.
	Perform a chi-square test for goodness of fit using technology.
Reading Lesson 12.1, Part 2	
Preparing to Conduct Inference for Two-Way Tables	
	Distinguish between a chi-square test for homogeneity and a chi-square test for association/independence.
	Check the conditions for a chi-square test for inference for a two-way table.
	Calculate the chi-square test statistic and P-value for inference for a two-way table.
Reading Lesson 12.2, Part 1	
Chi-Square Test for Homogeneity	

AP Statistics - MA5188		Scope and Sequence
Unit	**Lesson**	**Objectives**
		State appropriate hypotheses for a chi-square test for homogeneity.
		Carry out a chi-square test for homogeneity.
		Identify which observed counts were greater than expected and which observed counts were less than expected.
		Calculate the expected counts, chi-square test statistic, and P-value for a chi-square test for homogeneity using technology.
		Carry out a chi-square test for homogeneity given computer output.
	Reading Lesson 12.2, Part 2	
	Chi-Square Test of Association/Independence	
		State appropriate hypotheses for a chi-square test for association/independence.
		Carry out a chi-square test for association/independence.
		Identify which observed counts were greater than expected and which observed counts were less than expected.
		Calculate the expected counts, chi-square test statistic, and P-value for a chi-square test for association/independence using technology.
		Carry out a chi-square test for association/independence given computer output.
	Reading Lesson 12.2, Part 3	
	Preparing for Inference about Slope	
		Describe the shape, center, and/or variability of the sampling distribution of the regression slope.
		Estimate the parameters for the intercept, slope, standard error of the slope, and/or the standard deviation of the residuals using computer output.
		Check the conditions for inference about slope.
	Reading Lesson 12.3, Part 1	
	Confidence Intervals for Slope	

AP Statistics - MA5188		Scope and Sequence
Unit	Lesson	Objectives
		Construct a confidence interval for slope using computer output.
		Construct a confidence interval for slope using a graphing calculator.
		Interpret a confidence interval for slope.
	Reading Lesson 12.3, Part 2	
	Significance Test for Slope	
		Carry out a significance test for slope using computer output.
		Carry out a significance test for slope using a graphing calculator.
		Interpret the P-value of a significance test for slope.
	Reading Lesson 12.3, Part 3	
	Unit 12 AP Practice Free-Response Questions	
	Unit 12 Test	
		State the hypotheses for a chi-square test for goodness of fit.
		Determine if the conditions for a chi-square test for goodness of fit are met.
		Calculate the chi-square test statistic and P-value.
		Perform a chi-square test for goodness of fit given a distribution of equally likely outcomes.
		Perform a chi-square test for goodness of fit given a distribution with claimed proportions.
		Distinguish between a chi-square test for homogeneity and a chi-square test for association/independence.
		Check the conditions for a chi-square test for inference for a two-way table.
		Calculate the chi-square test statistic and P-value for inference for a two-way table.
		State appropriate hypotheses for a chi-square test for homogeneity.
		State appropriate hypotheses for a chi-square test for association/independence.
		Carry out a chi-square test for association/independence.

Unit	Lesson	Objectives
		Describe the shape, center, and/or variability of the sampling distribution of the regression slope.
		Estimate the parameters for the intercept, slope, standard error of the slope, and/or the standard deviation of the residuals using computer output.
		Check the conditions for inference about slope.
		Construct a confidence interval for slope using computer output.
		Construct a confidence interval for slope using a graphing calculator.
		Interpret a confidence interval for slope.
		Carry out a significance test for slope using computer output.
		Carry out a significance test for slope using a graphing calculator.
		Interpret the P-value of a significance test for slope.
Cumulative Exam 2		
	Cumulative Exam	
AP Review		
	Preparing for the Exam	
	Unit 1 Review	
	Unit 2 Review	
	Unit 3 Review	
	Unit 4 Review	
	Unit 5 Review	
	Unit 6 Review	
	Unit 7 Review	
	Unit 8 Review	
	Unit 9 Review	

AP Statistics - MA5188	Scope and Sequence
Unit Lesson	Objectives
Unit 10 Review	
Unit 11 Review	
Unit 12 Review	
Practice Exam 1	
Practice Exam 1 – Multiple-Choice Section	
	Decide whether two categorical variables are associated using segmented or side-by-side bar graphs.
	Compare two distributions using histograms.
	Analyze the effect of extreme values on the value of the mean and median.
	Identify if a univariate data set contains any outliers.
	Calculate the percentile for individual values in a quantitative data set.
	Compare performance using two or more z-scores.
	Describe the effect of unusual observations on the correlation.
	Interpret the slope and y-intercept of a linear model.
	Write the equation of a least-squares regression line that describes a transformed data set given computer output.
	Choose an appropriate model for a bivariate data set given regression output and residual plots.
	Analyze a study to determine if bias is present and whether that bias leads to an over or underestimate of the population parameter.
	Describe the sampling problems of undercoverage, nonresponse, and response and question wording bias.
	Describe the effect of confounding.
	Identify the explanatory variable, response variable, treatments, experimental units/subjects, the factors and the levels of an experimental design.
	Describe the structure of the matched pairs version of a randomized block design, including details about the randomization process.

AP Statistics - MA5188	Scope and Sequence
Unit Lesson	Objectives
	Determine probabilities using a two-way table.
	Calculate a probability using the general multiplication rule.
	Calculate the probability of "at least one" using the multiplication rule for independent events and other multi-step probabilities.
	Calculate the probability of an event given a probability distribution of a discrete random variable.
	Calculate the mean, median, and/or standard deviation of the probability distribution of a discrete random variable.
	Calculate a probability or value for a Normal random variable.
	Calculate the mean and standard deviation of a transformed random variable.
	Calculate the mean and standard deviation of the sum or difference of two or more random variables.
	Calculate cumulative binomial probabilities using a graphing calculator.
	Calculate a geometric probability using a graphing calculator.
	Calculate a probability based upon the sampling distribution of $p^1 - p^2$.
	Calculate probabilities given a normal population based upon the sampling distribution of the sample mean or difference in sample means.
	Interpret the confidence level.
	Determine how the margin of error and width of the interval is affected by the confidence level and sample size.
	Calculate the minimum sample size that is needed to construct a confidence interval for a population proportion with a given confidence level and a given margin of error.
	Interpret the P-value.
	Describe the power of a test and/or what influences the power of a test.
	Construct a confidence interval for a difference in two population means.
	Evaluate a claim about a population mean difference based upon a confidence interval.
	Draw a conclusion based upon a calculated P-value.

AP Statistics - MA5188		Scope and Sequence
Unit	Lesson	Objectives
		Identify and give a consequence of a Type I and Type II error.
		Distinguish between one sample, two samples, and paired data.
		Determine the appropriate inference procedure.
		Calculate the chi-square test statistic and P-value for inference for a two-way table
		Carry out a significance test for slope using computer output.
	Practice Exam 1 – Free-Response Section	
	Practice Exam 2	
	Practice Exam 2 – Multiple-Choice Section	
		Given a two-way table, calculate marginal and joint relative frequency distributions.
		Compare two distributions using dotplots or stemplots.
		Calculate/interpret the range, standard deviation, or interquartile range of a univariate data set.
		Describe the center, shape and spread of a distribution whose values have been transformed by a combination of addition or subtraction and by multiplying or dividing by a constant value.
		Describe a normal distribution using the empirical rule. Calculate probabilities using the empirical rule.
		Estimate the proportion of values in a Normal distribution for inclusive intervals of less than or equal to, greater than or equal to, or between and including values.
		Distinguish between correlation and causation.
		Make a prediction using a linear model.
		Calculate residuals.
		Distinguish between stratified random sampling, systematic random sampling, and cluster sampling.
		Distinguish between an observational study and an experiment.
		Identify the placebo effect, as well as the benefits of blindness within an experimental design.

AP Statistics - MA5188		Scope and Sequence
Unit	**Lesson**	**Objectives**
		Determine probabilities using a Venn diagram.
		Interpret a conditional probability.
		Calculate a probability using the multiplication rule for independent events.
		Calculate a probability of a value within the distribution of a transformed random variable.
		Calculate binomial probabilities using the binomial probability formula.
		Calculate the mean and standard deviation of a geometric random variable.
		Determine the shape, mean, and/or standard deviation of the sampling distribution of the sample proportion.
		Calculate a probability based upon the sampling distribution of $\hat{p}$.
		Determine if there is convincing evidence against a claim based upon a calculated probability.
		Interpret a confidence interval.
		Verify if each of the conditions for calculating a confidence interval for a population proportion are met.
		Construct a confidence interval for a population proportion.
		Determine whether the conditions for calculating a confidence interval for a difference in two population proportions are met.
		Describe and give a consequence of a Type I and Type II error.
		Draw a conclusion based upon an estimated P-value.
		Conduct a hypothesis test about a population proportion.
		Calculate a test statistic and P-value for a hypothesis test about a population proportion using a graphing calculator.
		Determine the t critical value needed to compute a C% confidence interval for a population mean.
		Construct a confidence interval for a population mean.
		Describe how the margin of error of a confidence interval can be reduced.
		Construct a confidence interval for a mean difference.

AP Statistics - MA5188	Scope and Sequence
Unit Lesson	**Objectives**
	Calculate the test statistic and the P-value for a hypothesis test about a population mean.
	State a conclusion about a hypothesis test for a population mean based upon a confidence interval.
	Conduct a hypothesis test about a mean difference.
	Determine if the conditions for a chi-square test for goodness of fit are met.
	Check the conditions for a chi-square test for inference for a two-way table.
	Describe the shape, center, and/or variability of the sampling distribution of the regression slope.
	Construct a confidence interval for slope using a graphing calculator.
Practice Exam 2 – Free-Response Section	