



Pine Grove Area

SCHOOL DISTRICT

MATHEMATICS

C. P. STATISTICS

October 15, 2009

I. PHILOSOPHY

The C. P. Statistics course reflects the complexity and sophistication that students are expected to demonstrate in a basic college level course. It will reinforce previous learning that enables the students to communicate mathematically, use mathematics as a tool to help organize and understand information from other academic disciplines, and use technology effectively to enhance their learning of mathematics concepts and skill. The course will allow for the accommodation of many learning styles, motivational levels, and academic abilities.

II. CORE CONCEPTS

1. Organizing Data: Definitions of terms, Graphs and Displays, Frequency Distributions and Histograms
2. Averages and Variation: Measures of Central Tendency, Measures of Variation, Percentiles and Box-and-Whisker Plots
3. Regression and Correlation: Paired Data and Scatter Plots, Linear Regression, Linear Correlation Coefficient
4. Elementary Probability Theory: Definitions Relating to Probability, Probability Rules, Counting Techniques
5. Binomial Probability Distribution: Random Variables and Probability Distributions, Binomial Probabilities, Mean and Standard Deviation of Binomial Distribution
6. Normal Distributions: Graphs of Normal Probability Distributions, Standard Units and Areas Under the Standard Normal Distribution, Areas Under Any Normal Curve, Normal Approximation to the Binomial Distribution
7. Sampling Distributions: Sampling Distributions, The Central Limit Theorem
8. Estimation: Estimating μ with Large Samples, Estimating μ with Small Samples, Estimating p in the Binomial Distribution, Choosing the Sample Size
9. Hypothesis Testing Involving One Population: Hypothesis Testing, Tests Involving the Mean μ in Large Samples, The P Value in Hypothesis Testing, Tests Involving the Mean μ in Small Samples, Tests Involving a Proportion
10. Inferences About Differences: Tests Involving Paired Differences (Dependent Samples), Inferences About the Difference of Two Means (Large, Independent Samples), Inferences About the Difference of Two Proportions

III. COURSE OF STUDY

A. Course Name: C. P. Statistics

B. Grade Level: 11 & 12

C. Length of Course: full year

1. Frequency: daily

2. Duration: one period

D. Academic Level: College Prep

E. Credits: 1

F. Prerequisites: CP Algebra 2

G. Course Description:

This advanced mathematics course explores the topics of descriptive statistics, probability, estimation, hypothesis testing, normal distributions, sampling, and linear regression while incorporating an activity based approach.

IV. CONTENT: C. P. Statistics

CORE CONCEPT 1: Organizing Data

MAJOR OBJECTIVE: Definitions of terms, Graphs and Displays, Frequency Distributions and Histograms

CURRICULUM STANDARD:

PA State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.5.11.B</p> <p>Use symbols, mathematical terminology, standard notation, mathematical rules, graphing and other types of mathematical representations to communicate observations, predictions, concepts, procedures, generalizations, ideas and results.</p>	<p>Teacher will guide students to:</p> <p>Define terms relating to populations and samples.</p> <p>Identify methods of producing data.</p> <p>Identify levels of measurement.</p> <p>Identify sampling techniques.</p>	<p>Teacher evaluation of:</p> <p>Student board work.</p> <p>Student responses.</p> <p>Student homework/class work assignments.</p> <p>Student group work.</p> <p>Student workbooks.</p> <p>Student notebooks/journals.</p> <p>Student quizzes/tests.</p> <p>Student presentations.</p> <p>Student performance on Study Island.</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p> <p>Graphing calculators</p> <p>Measurement tools</p> <p>Construction tools</p>

CONTENT: C. P. Statistics

CORE CONCEPT 1: Organizing Data

MAJOR OBJECTIVE: Definitions of terms, Graphs and Displays, Frequency Distributions and Histograms

CURRICULUM STANDARD:

PA State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.6.11.E</p> <p>Determine the validity of the sampling method described in a given study.</p>	<p>Teacher will guide students to:</p> <p>Define terms relating to populations and samples.</p> <p>Identify methods of producing data.</p> <p>Identify levels of measurement.</p> <p>Identify sampling techniques.</p>	<p>Teacher evaluation of:</p> <p>Student board work.</p> <p>Student responses.</p> <p>Student homework/class work assignments.</p> <p>Student group work.</p> <p>Student workbooks.</p> <p>Student notebooks/journals.</p> <p>Student quizzes/tests.</p> <p>Student presentations.</p> <p>Student performance on Study Island.</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p> <p>Graphing calculators</p> <p>Measurement tools</p> <p>Construction tools</p>

CONTENT: C. P. Statistics

CORE CONCEPT 1: Organizing Data

MAJOR OBJECTIVE: Definitions of terms, Graphs and Displays, Frequency Distributions and Histograms

CURRICULUM STANDARD:

PA State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.6.11.G</p> <p>Describe questions of experimental design, control groups, treatment groups, cluster sampling and reliability.</p>	<p>Teacher will guide students to:</p> <p>Define terms relating to populations and samples.</p> <p>Identify methods of producing data.</p> <p>Identify levels of measurement.</p> <p>Identify sampling techniques.</p>	<p>Teacher evaluation of:</p> <p>Student board work.</p> <p>Student responses.</p> <p>Student homework/class work assignments.</p> <p>Student group work.</p> <p>Student workbooks.</p> <p>Student notebooks/journals.</p> <p>Student quizzes/tests.</p> <p>Student presentations.</p> <p>Student performance on Study Island.</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p> <p>Graphing calculators</p> <p>Measurement tools</p> <p>Construction tools</p>

CONTENT: C. P. Statistics

CORE CONCEPT 1: Organizing Data

MAJOR OBJECTIVE: Definitions of terms, Graphs and Displays, Frequency Distributions and Histograms

CURRICULUM STANDARD:

PA State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.6.11.B</p> <p>Use appropriate technology to organize and analyze data taken from the local community.</p>	<p>Teacher will guide students to:</p> <p>Create and interpret bar graphs, circle graphs, pareto charts, time plots, two-by-two tables, line plots, and stem-and-leaf displays.</p> <p>Create and interpret a frequency distribution and a relative frequency distribution.</p> <p>Create and interpret a histogram.</p>	<p>Teacher evaluation of:</p> <p>Student board work.</p> <p>Student responses.</p> <p>Student homework/class work assignments.</p> <p>Student group work.</p> <p>Student workbooks.</p> <p>Student notebooks/journals.</p> <p>Student quizzes/tests.</p> <p>Student presentations.</p> <p>Student performance on Study Island.</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p> <p>Graphing calculators</p> <p>Measurement tools</p> <p>Construction tools</p>

CONTENT: C. P. Statistics

CORE CONCEPT 2: Averages and Variation

MAJOR OBJECTIVE: Measures of Central Tendency, Measures of Variation, Percentiles and Box-and-Whisker Plots

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.6.11.A</p> <p>Design and conduct an experiment using random sampling. Describe the data as an example of a distribution using statistical measures of center and spread. Organize and represent the results with graphs. (Use standard deviation, variance and t-tests.)</p>	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"> • Calculate measures of mean, median, mode, and trimmed mean. • Determine which measure of central tendency is the most appropriate for a given situation. • Calculate measures of range, sample standard deviation, sample variance, population standard deviation, and population variance. • Calculate and compare the coefficient of variation to compare the variability of two different populations. • Use Chebyshev’s Theorem to identify a range about the mean of which at least a given percentage of data must lie. • Use percentiles to compare data values within a set. • Calculate the five-number summary (minimum, lower quartile, median, upper quartile, maximum) for a data set. • Construct a box-and-whisker plot using the five-number summary. • Calculate the Interquartile Range and use it to determine if outliers exist in a data set. 	<p>Teacher evaluation of:</p> <p>Student board work.</p> <p>Student responses.</p> <p>Student homework/class work assignments.</p> <p>Student group work.</p> <p>Student workbooks.</p> <p>Student notebooks/journals.</p> <p>Student quizzes/tests.</p> <p>Student presentations.</p> <p>Student performance on Study Island.</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p> <p>Graphing calculators</p> <p>Measurement tools</p> <p>Construction tools</p>

CONTENT: C. P. Statistics

CORE CONCEPT 3: Regression and Correlation

MAJOR OBJECTIVE: Paired Data and Scatter Plots, Linear Regression, Linear Correlation Coefficient

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.6.11.B</p> <p>Use appropriate technology to organize and analyze data taken from the local community.</p>	<p>Teacher will guide students to:</p> <p>Create and interpret a scatter diagram of paired data values.</p> <p>Describe correlation of paired data values as none, low, moderate, high, or perfect.</p>	<p>Teacher evaluation of:</p> <p>Student board work.</p> <p>Student responses.</p> <p>Student homework/class work assignments.</p> <p>Student group work.</p> <p>Student workbooks.</p> <p>Student notebooks/journals.</p> <p>Student quizzes/tests.</p> <p>Student presentations.</p> <p>Student performance on Study Island.</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p> <p>Graphing calculators</p> <p>Measurement tools</p> <p>Construction tools</p>

CONTENT: C. P. Statistics

CORE CONCEPT 3: Regression and Correlation

MAJOR OBJECTIVE: Paired Data and Scatter Plots, Linear Regression, Linear Correlation Coefficient

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.6.11.C</p> <p>Determine the regression equation of best fit (e.g., linear, quadratic, exponential).</p> <p>PA Standard 2.6.11.D</p> <p>Make predictions using interpolation, extrapolation, regression and estimation using technology to verify them.</p>	<p>Teacher will guide students to:</p> <p>Calculate and interpret the equation of the least-squares line of regression for a set of paired data values.</p> <p>Use the least-squares line to interpolate or extrapolate values for the dependent variable based on given values for the independent variable.</p> <p>Identify the effect of an extreme data point on the least-squares line.</p>	<p>Teacher evaluation of:</p> <p>Student board work.</p> <p>Student responses.</p> <p>Student homework/class work assignments.</p> <p>Student group work.</p> <p>Student workbooks.</p> <p>Student notebooks/journals.</p> <p>Student quizzes/tests.</p> <p>Student presentations.</p> <p>Student performance on Study Island.</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p> <p>Graphing calculators</p> <p>Measurement tools</p> <p>Construction tools</p>

CONTENT: C. P. Statistics

CORE CONCEPT 3: Regression and Correlation

MAJOR OBJECTIVE: Paired Data and Scatter Plots, Linear Regression, Linear Correlation Coefficient

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.6.11.F</p> <p>Determine the degree of dependence of two quantities specified by a two-way table.</p>	<p>Teacher will guide students to:</p> <p>Calculate and interpret the linear correlation coefficient for a given data set.</p> <p>Calculate and interpret the coefficient of determination for a given data set.</p>	<p>Teacher evaluation of:</p> <p>Student board work.</p> <p>Student responses.</p> <p>Student homework/class work assignments.</p> <p>Student group work.</p> <p>Student workbooks.</p> <p>Student notebooks/journals.</p> <p>Student quizzes/tests.</p> <p>Student presentations.</p> <p>Student performance on Study Island.</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p> <p>Graphing calculators</p> <p>Measurement tools</p> <p>Construction tools</p>

CONTENT: C. P. Statistics

CORE CONCEPT 4: Elementary Probability Theory

MAJOR OBJECTIVE: Definitions Relating to Probability, Probability Rules, Counting Techniques

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.7.11.A</p> <p>Compare odds and probability.</p>	<p>Teacher will guide students to:</p> <p>Calculate and interpret probability based on relative frequency.</p> <p>Calculate and interpret probability based on equally likely outcomes.</p> <p>Apply the law of large numbers to probability in real-world situations.</p> <p>Identify the sample space for an experiment.</p> <p>Identify and calculate the probability of the complement of an event.</p>	<p>Teacher evaluation of:</p> <p>Student board work.</p> <p>Student responses.</p> <p>Student homework/class work assignments.</p> <p>Student group work.</p> <p>Student workbooks.</p> <p>Student notebooks/journals.</p> <p>Student quizzes/tests.</p> <p>Student presentations.</p> <p>Student performance on Study Island.</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p> <p>Graphing calculators</p> <p>Measurement tools</p> <p>Construction tools</p>

CONTENT: C. P. Statistics

CORE CONCEPT 4: Elementary Probability Theory

MAJOR OBJECTIVE: Definitions Relating to Probability, Probability Rules, Counting Techniques

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.7.11.B</p> <p>Apply probability and statistics to perform an experiment involving a sample and generalize its results to the entire population.</p>	<p>Teacher will guide students to:</p> <p>Calculate and interpret probability based on relative frequency.</p> <p>Calculate and interpret probability based on equally likely outcomes.</p> <p>Apply the law of large numbers to probability in real-world situations.</p> <p>Identify the sample space for an experiment.</p> <p>Identify and calculate the probability of the complement of an event.</p>	<p>Teacher evaluation of:</p> <p>Student board work.</p> <p>Student responses.</p> <p>Student homework/class work assignments.</p> <p>Student group work.</p> <p>Student workbooks.</p> <p>Student notebooks/journals.</p> <p>Student quizzes/tests.</p> <p>Student presentations.</p> <p>Student performance on Study Island.</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p> <p>Graphing calculators</p> <p>Measurement tools</p> <p>Construction tools</p>

CONTENT: C. P. Statistics

CORE CONCEPT 4: Elementary Probability Theory

MAJOR OBJECTIVE: Definitions Relating to Probability, Probability Rules, Counting Techniques

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.7.11.C</p> <p>Draw and justify a conclusion regarding the validity of a probability or statistical argument.</p>	<p>Teacher will guide students to:</p> <p>Calculate and interpret probability based on relative frequency.</p> <p>Calculate and interpret probability based on equally likely outcomes.</p> <p>Apply the law of large numbers to probability in real-world situations.</p> <p>Identify the sample space for an experiment.</p> <p>Identify and calculate the probability of the complement of an event.</p>	<p>Teacher evaluation of:</p> <p>Student board work.</p> <p>Student responses.</p> <p>Student homework/class work assignments.</p> <p>Student group work.</p> <p>Student workbooks.</p> <p>Student notebooks/journals.</p> <p>Student quizzes/tests.</p> <p>Student presentations.</p> <p>Student performance on Study Island.</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p> <p>Graphing calculators</p> <p>Measurement tools</p> <p>Construction tools</p>

CONTENT: C. P. Statistics

CORE CONCEPT 4: Elementary Probability Theory

MAJOR OBJECTIVE: Definitions Relating to Probability, Probability Rules, Counting Techniques

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.7.11.D</p> <p>Use experimental and theoretical probability distributions to make judgments about the likelihood of various outcomes in uncertain situations.</p>	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"> • Calculate and interpret the odds of an event. • Identify events as independent, dependent, and/or mutually exclusive. • Calculate and interpret the probability of compound independent events (both “and” and “or.”) • Calculate and interpret the probability of compound dependent events (both “and” and “or.”) • Use tree diagrams and/or the multiplication rule of counting to determine the number of possible outcomes of an experiment consisting of a series of activities. • Identify and use factorial notation. • Calculate and interpret permutations in an appropriate situation. • Calculate and interpret combinations in an appropriate situation. 	<p>Teacher evaluation of:</p> <p>Student board work.</p> <p>Student responses.</p> <p>Student homework/class work assignments.</p> <p>Student group work.</p> <p>Student workbooks.</p> <p>Student notebooks/journals.</p> <p>Student quizzes/tests.</p> <p>Student presentations.</p> <p>Student performance on Study Island.</p>	<p>Teacher evaluation of:</p> <p>Student board work.</p> <p>Student responses.</p> <p>Student homework/class work assignments.</p> <p>Student group work.</p> <p>Student workbooks.</p> <p>Student notebooks/journals.</p> <p>Student quizzes/tests.</p> <p>Student presentations.</p> <p>Student performance on Study Island.</p>

CONTENT: C. P. Statistics

CORE CONCEPT 4: Elementary Probability Theory

MAJOR OBJECTIVE: Definitions Relating to Probability, Probability Rules, Counting Techniques

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.7.11.E</p> <p>Solve problems involving independent simple and compound events.</p>	<p>Teacher will guide students to:</p> <p>Calculate and interpret the odds of an event.</p> <p>Identify events as independent, dependent, and/or mutually exclusive.</p> <p>Calculate and interpret the probability of compound independent events (both “and” and “or.”)</p> <p>Calculate and interpret the probability of compound dependent events (both “and” and “or.”)</p>	<p>Teacher evaluation of:</p> <p>Student board work.</p> <p>Student responses.</p> <p>Student homework/class work assignments.</p> <p>Student group work.</p> <p>Student workbooks.</p> <p>Student notebooks/journals.</p> <p>Student quizzes/tests.</p> <p>Student presentations.</p> <p>Student performance on Study Island.</p>	<p>Teacher evaluation of:</p> <p>Student board work.</p> <p>Student responses.</p> <p>Student homework/class work assignments.</p> <p>Student group work.</p> <p>Student workbooks.</p> <p>Student notebooks/journals.</p> <p>Student quizzes/tests.</p> <p>Student presentations.</p> <p>Student performance on Study Island.</p>

CONTENT: C. P. Statistics

CORE CONCEPT 5: Binomial Probability Distribution

MAJOR OBJECTIVE: Random Variables and Probability Distributions, Binomial Probabilities, Mean and Standard Deviation of Binomial Distribution

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.6.11.A</p> <p>Design and conduct an experiment using random sampling. Describe the data as an example of a distribution using statistical measures of center and spread. Organize and represent the results with graphs. (Use standard deviation, variance and t-tests.)</p>	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"> • Distinguish between discrete and continuous random variables. • Construct a discrete probability distribution and the corresponding relative frequency histogram. • Calculate and interpret the mean (or expected value) and standard deviation of a discrete probability distribution. • Identify the components of a binomial experiment and relate them to a specific problem. • Use a model of the sample space to calculate and interpret the binomial probabilities for the binomial probability distribution. • Calculate and interpret the binomial probabilities using the general formula for the binomial probability distribution. • Identify and interpret the binomial probabilities using a table of values for the binomial probability distribution. • Create and interpret a histogram to represent the binomial probability distribution. • Calculate and interpret the mean and standard deviation of the binomial probability distribution. 	<p>Teacher evaluation of:</p> <p>Student board work.</p> <p>Student responses.</p> <p>Student homework/class work assignments.</p> <p>Student group work.</p> <p>Student workbooks.</p> <p>Student notebooks/journals.</p> <p>Student quizzes/tests.</p> <p>Student presentations.</p> <p>Student performance on Study Island.</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p> <p>Graphing calculators</p> <p>Measurement tools</p> <p>Construction tools</p>

CONTENT: C. P. Statistics

CORE CONCEPT 6: Normal Distributions

MAJOR OBJECTIVE: Graphs of Normal Probability Distributions, Standard Units and Areas Under the Standard Normal Distribution, Areas Under Any Normal Curve, Normal Approximation to the Binomial Distribution

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.6.11.I</p> <p>Describe the normal curve and use its properties to answer questions about sets of data that are assumed to be normally distributed.</p>	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"> • Identify the properties of a normal curve. • Define and use the Empirical Rule for distributions that are symmetrical and bell-shaped. • Create and interpret control charts. • Identify out-of-control warning signals in a control chart. • Convert raw scores to standard (z) scores. • Convert standard (z) scores to raw scores. • Compare raw scores from different data sets using standard (z) scores. • Identify the standard normal distribution and its corresponding graph. • Use a table of values to find areas under the standard normal curve and relate these areas to the probability of an event. • Convert a normal distribution to a standard normal distribution. • Use the standard normal curve to calculate probabilities. 	<p>Teacher evaluation of:</p> <p>Student board work.</p> <p>Student responses.</p> <p>Student homework/class work assignments.</p> <p>Student group work.</p> <p>Student workbooks.</p> <p>Student notebooks/journals.</p> <p>Student quizzes/tests.</p> <p>Student presentations.</p> <p>Student performance on Study Island.</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p> <p>Graphing calculators</p> <p>Measurement tools</p> <p>Construction tools</p>

CONTENT: C. P. Statistics

CORE CONCEPT 6: Normal Distributions

MAJOR OBJECTIVE: Graphs of Normal Probability Distributions, Standard Units and Areas Under the Standard Normal Distribution, Areas Under Any Normal Curve, Normal Approximation to the Binomial Distribution

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.6.11.I</p> <p>Describe the normal curve and use its properties to answer questions about sets of data that are assumed to be normally distributed.</p>	<ul style="list-style-type: none">• Use the standard normal curve to calculate raw scores for a given probability.• Identify the conditions under which the binomial probability distribution may be approximated using a standard normal curve.• Apply continuity corrections so that the binomial probability distribution (discrete) is approximated by the standard normal distribution (continuous.)• Calculate and interpret binomial probabilities using a standard normal curve.		

CONTENT: C. P. Statistics

CORE CONCEPT 7: Sampling Distributions

MAJOR OBJECTIVE: Sampling Distributions, The Central Limit Theorem

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.6.11.H</p> <p>Use sampling techniques to draw inferences about large populations.</p>	<p>Teacher will guide students to:</p> <p>Create and interpret a relative frequency table for the sample means of a sampling distribution.</p> <p>Create and interpret a histogram to represent the relative frequency of the sample means of a sampling distribution.</p> <p>Identify the properties of the sample mean distribution when assuming the raw data has a normal distribution.</p> <p>Calculate and interpret the mean and standard deviation (standard error of the mean) of the sample mean distribution.</p> <p>Identify the conditions under which the sample mean distribution of an unknown distribution may be approximated by the standard normal distribution (Central Limit Theorem.)</p>	<p>Teacher evaluation of:</p> <p>Student board work.</p> <p>Student responses.</p> <p>Student homework/class work assignments.</p> <p>Student group work.</p> <p>Student workbooks.</p> <p>Student notebooks/journals.</p> <p>Student quizzes/tests.</p> <p>Student presentations.</p> <p>Student performance on Study Island.</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p> <p>Graphing calculators</p> <p>Measurement tools</p> <p>Construction tools</p>

CONTENT: C. P. Statistics

CORE CONCEPT 7: Sampling Distributions

MAJOR OBJECTIVE: Sampling Distributions, The Central Limit Theorem

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.6.11.I</p> <p>Describe the normal curve and use its properties to answer questions about sets of data that are assumed to be normally distributed.</p>	<p>Teacher will guide students to:</p> <p>Identify the properties of the sample mean distribution when assuming the raw data has a normal distribution.</p> <p>Calculate and interpret the mean and standard deviation (standard error of the mean) of the sample mean distribution.</p> <p>Identify the conditions under which the sample mean distribution of an unknown distribution may be approximated by the standard normal distribution (Central Limit Theorem.)</p>	<p>Teacher evaluation of:</p> <p>Student board work.</p> <p>Student responses.</p> <p>Student homework/class work assignments.</p> <p>Student group work.</p> <p>Student workbooks.</p> <p>Student notebooks/journals.</p> <p>Student quizzes/tests.</p> <p>Student presentations.</p> <p>Student performance on Study Island.</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p> <p>Graphing calculators</p> <p>Measurement tools</p> <p>Construction tools</p>

CONTENT: C. P. Statistics

CORE CONCEPT 8: Estimation

MAJOR OBJECTIVE: Estimating μ with Large Samples, Estimating μ with Small Samples, Estimating p in the Binomial Distribution, Choosing the Sample Size

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.6.11.H</p> <p>Use sampling techniques to draw inferences about large populations.</p>	<p>Teacher will guide students to:</p> <ul style="list-style-type: none">• Define and interpret confidence levels.• Determine the critical value (z) for a given confidence level and a large sample.• Calculate and interpret the error of estimate.• Calculate and interpret the confidence interval for the population mean based on a sample mean of a large sample.• Determine the degrees of freedom for a given small sample size.• Determine the critical value (t) for a given confidence level and a small sample.• Calculate and interpret the error of estimate.• Calculate and interpret the confidence interval for the population mean based on a sample mean of a small sample.• Identify the conditions under which a binomial distribution may be approximated by a normal distribution.• Calculate and interpret the error of estimate for a binomial distribution.	<p>Teacher evaluation of:</p> <p>Student board work.</p> <p>Student responses.</p> <p>Student homework/class work assignments.</p> <p>Student group work.</p> <p>Student workbooks.</p> <p>Student notebooks/journals.</p> <p>Student quizzes/tests.</p> <p>Student presentations.</p> <p>Student performance on Study Island.</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p> <p>Graphing calculators</p> <p>Measurement tools</p> <p>Construction tools</p>

CONTENT: C. P. Statistics

CORE CONCEPT 8: Estimation

MAJOR OBJECTIVE: Estimating μ with Large Samples, Estimating μ with Small Samples, Estimating p in the Binomial Distribution, Choosing the Sample Size

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.6.11.H</p> <p>Use sampling techniques to draw inferences about large populations.</p>	<ul style="list-style-type: none">• Calculate and interpret the confidence interval for the population proportion based on a sample proportion of a large sample.• Calculate and interpret the margin of error in real-world situations.• Calculate and interpret the sample size necessary to estimate the population mean at a given confidence level.• Calculate and interpret the sample size necessary to estimate the population proportion at a given confidence level when an estimate of the proportion is known.• Calculate and interpret the sample size necessary to estimate the population proportion at a given confidence level when an estimate of the proportion is not known.		

CONTENT: C. P. Statistics

CORE CONCEPT 8: Estimation

MAJOR OBJECTIVE: Estimating μ with Large Samples, Estimating μ with Small Samples, Estimating p in the Binomial Distribution, Choosing the Sample Size

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.6.11.I</p> <p>Describe the normal curve and use its properties to answer questions about sets of data that are assumed to be normally distributed.</p>	<p>Teacher will guide students to:</p> <ul style="list-style-type: none"> • Define and interpret confidence levels. • Determine the critical value (z) for a given confidence level and a large sample. • Calculate and interpret the error of estimate. • Calculate and interpret the confidence interval for the population mean based on a sample mean of a large sample. • Determine the degrees of freedom for a given small sample size. • Determine the critical value (t) for a given confidence level and a small sample. • Calculate and interpret the error of estimate. • Calculate and interpret the confidence interval for the population mean based on a sample mean of a small sample. • Identify the conditions under which a binomial distribution may be approximated by a normal distribution. • Calculate and interpret the error of estimate for a binomial distribution. 	<p>Teacher evaluation of:</p> <p>Student board work.</p> <p>Student responses.</p> <p>Student homework/class work assignments.</p> <p>Student group work.</p> <p>Student workbooks.</p> <p>Student notebooks/journals.</p> <p>Student quizzes/tests.</p> <p>Student presentations.</p> <p>Student performance on Study Island.</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p> <p>Graphing calculators</p> <p>Measurement tools</p> <p>Construction tools</p>

CONTENT: C. P. Statistics

CORE CONCEPT 8: Estimation

MAJOR OBJECTIVE: Estimating μ with Large Samples, Estimating μ with Small Samples, Estimating p in the Binomial Distribution, Choosing the Sample Size

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.6.11.I</p> <p>Describe the normal curve and use its properties to answer questions about sets of data that are assumed to be normally distributed.</p>	<ul style="list-style-type: none">• Calculate and interpret the confidence interval for the population proportion based on a sample proportion of a large sample.• Calculate and interpret the margin of error in real-world situations.• Calculate and interpret the sample size necessary to estimate the population mean at a given confidence level.• Calculate and interpret the sample size necessary to estimate the population proportion at a given confidence level when an estimate of the proportion is known.• Calculate and interpret the sample size necessary to estimate the population proportion at a given confidence level when an estimate of the proportion is not known.		

CONTENT: C. P. Statistics

CORE CONCEPT 9: Hypothesis Testing Involving One Population

MAJOR OBJECTIVE: Hypothesis Testing, Tests Involving the Mean μ in Large Samples, The P Value in Hypothesis Testing, Tests Involving the Mean μ in Small Samples, Tests Involving a Proportion

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.6.11.H</p> <p>Use sampling techniques to draw inferences about large populations.</p>	<p>Teacher will guide students to:</p> <p>Define and interpret the null hypothesis about the population parameter.</p> <p>Define and interpret the alternate hypothesis about the population parameter.</p> <p>Define and interpret the types of errors associated with hypothesis testing.</p> <p>Define and interpret the level of significance of a hypothesis test.</p> <p>Define and interpret the power of a hypothesis test.</p> <p>Describe the meaning of accepting the null hypothesis of a test.</p> <p>Identify and interpret the critical regions of a hypothesis test.</p> <p>Define and interpret the null and alternate hypothesis for the population mean for a large sample.</p> <p>Determine the critical values (z) necessary to perform the test to the given level of significance.</p> <p>Covert the sample test statistic (sample mean) to a standard normal value (z).</p>	<p>Teacher evaluation of:</p> <p>Student board work.</p> <p>Student responses.</p> <p>Student homework/class work assignments.</p> <p>Student group work.</p> <p>Student workbooks.</p> <p>Student notebooks/journals.</p> <p>Student quizzes/tests.</p> <p>Student presentations.</p> <p>Student performance on Study Island.</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p> <p>Graphing calculators</p> <p>Measurement tools</p> <p>Construction tools</p>

CONTENT: C. P. Statistics

CORE CONCEPT 9: Hypothesis Testing Involving One Population

MAJOR OBJECTIVE: Hypothesis Testing, Tests Involving the Mean μ in Large Samples, The P Value in Hypothesis Testing, Tests Involving the Mean μ in Small Samples, Tests Involving a Proportion

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.6.11.H</p> <p>Use sampling techniques to draw inferences about large populations.</p>	<p>Compare the standard normal value to the critical values to determine acceptance of the null hypothesis.</p> <p>Draw a conclusion as to the statistical significance of the test.</p> <p>Determine and interpret the <i>P</i> value for tests of the population mean.</p> <p>Define and interpret the test conclusions based on the <i>P</i> values.</p> <p>Define and interpret the null and alternate hypothesis for the population mean for a small sample.</p> <p>Calculate and interpret the degrees of freedom based on the small sample size.</p> <p>Determine the critical values (<i>t</i>) necessary to perform the test to the given level of significance.</p> <p>Covert the sample test statistic (sample mean) to a standard normal value (<i>t</i>).</p> <p>Compare the standard normal value to the critical values to determine acceptance of the null hypothesis.</p> <p>Draw a conclusion as to the statistical significance of the test.</p>		

CONTENT: C. P. Statistics

CORE CONCEPT 9: Hypothesis Testing Involving One Population

MAJOR OBJECTIVE: Hypothesis Testing, Tests Involving the Mean μ in Large Samples, The P Value in Hypothesis Testing, Tests Involving the Mean μ in Small Samples, Tests Involving a Proportion

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.6.11.H</p> <p>Use sampling techniques to draw inferences about large populations.</p>	<p>Determine and interpret the P value for tests of the population mean.</p> <p>Define and interpret the test conclusions based on the P values.</p> <p>Define and interpret the null and alternate hypothesis for the population proportion for a sample that meets the criteria for a binomial distribution.</p> <p>Determine the critical values (z) necessary to perform the test to the given level of significance.</p> <p>Covert the sample test statistic (sample proportion) to a standard normal value (z).</p> <p>Draw a conclusion as to the statistical significance of the test.</p> <p>Determine and interpret the P value for tests of the population proportion.</p> <p>Define and interpret the test conclusions based on the P values.</p>		

CONTENT: C. P. Statistics

CORE CONCEPT 9: Hypothesis Testing Involving One Population

MAJOR OBJECTIVE: Hypothesis Testing, Tests Involving the Mean μ in Large Samples, The P Value in Hypothesis Testing, Tests Involving the Mean μ in Small Samples, Tests Involving a Proportion

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.6.11.I</p> <p>Describe the normal curve and use its properties to answer questions about sets of data that are assumed to be normally distributed.</p>	<p>Teacher will guide students to:</p> <p>Define and interpret the null hypothesis about the population parameter.</p> <p>Define and interpret the alternate hypothesis about the population parameter.</p> <p>Define and interpret the types of errors associated with hypothesis testing.</p> <p>Define and interpret the level of significance of a hypothesis test.</p> <p>Define and interpret the power of a hypothesis test.</p> <p>Describe the meaning of accepting the null hypothesis of a test.</p> <p>Identify and interpret the critical regions of a hypothesis test.</p> <p>Define and interpret the null and alternate hypothesis for the population mean for a large sample.</p> <p>Determine the critical values (z) necessary to perform the test to the given level of significance.</p> <p>Covert the sample test statistic (sample mean) to a standard normal value (z).</p>	<p>Teacher evaluation of:</p> <p>Student board work.</p> <p>Student responses.</p> <p>Student homework/class work assignments.</p> <p>Student group work.</p> <p>Student workbooks.</p> <p>Student notebooks/journals.</p> <p>Student quizzes/tests.</p> <p>Student presentations.</p> <p>Student performance on Study Island.</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p> <p>Graphing calculators</p> <p>Measurement tools</p> <p>Construction tools</p>

CONTENT: C. P. Statistics

CORE CONCEPT 9: Hypothesis Testing Involving One Population

MAJOR OBJECTIVE: Hypothesis Testing, Tests Involving the Mean μ in Large Samples, The P Value in Hypothesis Testing, Tests Involving the Mean μ in Small Samples, Tests Involving a Proportion

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.6.11.I</p> <p>Describe the normal curve and use its properties to answer questions about sets of data that are assumed to be normally distributed.</p>	<p>Compare the standard normal value to the critical values to determine acceptance of the null hypothesis.</p> <p>Draw a conclusion as to the statistical significance of the test.</p> <p>Determine and interpret the <i>P</i> value for tests of the population mean.</p> <p>Define and interpret the test conclusions based on the <i>P</i> values.</p> <p>Define and interpret the null and alternate hypothesis for the population mean for a small sample.</p> <p>Calculate and interpret the degrees of freedom based on the small sample size.</p> <p>Determine the critical values (<i>t</i>) necessary to perform the test to the given level of significance.</p> <p>Covert the sample test statistic (sample mean) to a standard normal value (<i>t</i>).</p> <p>Compare the standard normal value to the critical values to determine acceptance of the null hypothesis.</p> <p>Draw a conclusion as to the statistical significance of the test.</p>		

CONTENT: C. P. Statistics

CORE CONCEPT 9: Hypothesis Testing Involving One Population

MAJOR OBJECTIVE: Hypothesis Testing, Tests Involving the Mean μ in Large Samples, The P Value in Hypothesis Testing, Tests Involving the Mean μ in Small Samples, Tests Involving a Proportion

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.6.11.I</p> <p>Describe the normal curve and use its properties to answer questions about sets of data that are assumed to be normally distributed.</p>	<p>Determine and interpret the P value for tests of the population mean.</p> <p>Define and interpret the test conclusions based on the P values.</p> <p>Define and interpret the null and alternate hypothesis for the population proportion for a sample that meets the criteria for a binomial distribution.</p> <p>Determine the critical values (z) necessary to perform the test to the given level of significance.</p> <p>Covert the sample test statistic (sample proportion) to a standard normal value (z).</p> <p>Draw a conclusion as to the statistical significance of the test.</p> <p>Determine and interpret the P value for tests of the population proportion.</p> <p>Define and interpret the test conclusions based on the P values.</p>		

CONTENT: C. P. Statistics

CORE CONCEPT 9: Hypothesis Testing Involving One Population

MAJOR OBJECTIVE: Hypothesis Testing, Tests Involving the Mean μ in Large Samples, The P Value in Hypothesis Testing, Tests Involving the Mean μ in Small Samples, Tests Involving a Proportion

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.7.11.B</p> <p>Apply probability and statistics to perform an experiment involving a sample and generalize its results to the entire population.</p>	<p>Teacher will guide students to:</p> <p>Define and interpret the null hypothesis about the population parameter.</p> <p>Define and interpret the alternate hypothesis about the population parameter.</p> <p>Define and interpret the types of errors associated with hypothesis testing.</p> <p>Define and interpret the level of significance of a hypothesis test.</p> <p>Define and interpret the power of a hypothesis test.</p> <p>Describe the meaning of accepting the null hypothesis of a test.</p> <p>Identify and interpret the critical regions of a hypothesis test.</p> <p>Define and interpret the null and alternate hypothesis for the population mean for a large sample.</p> <p>Determine the critical values (z) necessary to perform the test to the given level of significance.</p> <p>Covert the sample test statistic (sample mean) to a standard normal value (z).</p>	<p>Teacher evaluation of:</p> <p>Student board work.</p> <p>Student responses.</p> <p>Student homework/class work assignments.</p> <p>Student group work.</p> <p>Student workbooks.</p> <p>Student notebooks/journals.</p> <p>Student quizzes/tests.</p> <p>Student presentations.</p> <p>Student performance on Study Island.</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p> <p>Graphing calculators</p> <p>Measurement tools</p> <p>Construction tools</p>

CONTENT: C. P. Statistics

CORE CONCEPT 9: Hypothesis Testing Involving One Population

MAJOR OBJECTIVE: Hypothesis Testing, Tests Involving the Mean μ in Large Samples, The P Value in Hypothesis Testing, Tests Involving the Mean μ in Small Samples, Tests Involving a Proportion

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.7.11.B</p> <p>Apply probability and statistics to perform an experiment involving a sample and generalize its results to the entire population.</p>	<p>Compare the standard normal value to the critical values to determine acceptance of the null hypothesis.</p> <p>Draw a conclusion as to the statistical significance of the test.</p> <p>Determine and interpret the <i>P</i> value for tests of the population mean</p> <p>Define and interpret the test conclusions based on the <i>P</i> values.</p> <p>Define and interpret the null and alternate hypothesis for the population mean for a small sample.</p> <p>Calculate and interpret the degrees of freedom based on the small sample size.</p> <p>Determine the critical values (<i>t</i>) necessary to perform the test to the given level of significance.</p> <p>Covert the sample test statistic (sample mean) to a standard normal value (<i>t</i>).</p> <p>Compare the standard normal value to the critical values to determine acceptance of the null hypothesis.</p> <p>Draw a conclusion as to the statistical significance of the test.</p>		

CONTENT: C. P. Statistics

CORE CONCEPT 9: Hypothesis Testing Involving One Population

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CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.7.11.B</p> <p>Apply probability and statistics to perform an experiment involving a sample and generalize its results to the entire population.</p>	<p>Determine and interpret the P value for tests of the population mean.</p> <p>Define and interpret the test conclusions based on the P values.</p> <p>Define and interpret the null and alternate hypothesis for the population proportion for a sample that meets the criteria for a binomial distribution.</p> <p>Determine the critical values (z) necessary to perform the test to the given level of significance.</p> <p>Covert the sample test statistic (sample proportion) to a standard normal value (z).</p> <p>Draw a conclusion as to the statistical significance of the test.</p> <p>Determine and interpret the P value for tests of the population proportion.</p> <p>Define and interpret the test conclusions based on the P values.</p>		

CONTENT: C. P. Statistics

CORE CONCEPT 9: Hypothesis Testing Involving One Population

MAJOR OBJECTIVE: Hypothesis Testing, Tests Involving the Mean μ in Large Samples, The P Value in Hypothesis Testing, Tests Involving the Mean μ in Small Samples, Tests Involving a Proportion

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.7.11.C</p> <p>Draw and justify a conclusion regarding the validity of a probability or statistical argument.</p>	<p>Teacher will guide students to:</p> <p>Define and interpret the null hypothesis about the population parameter.</p> <p>Define and interpret the alternate hypothesis about the population parameter.</p> <p>Define and interpret the types of errors associated with hypothesis testing.</p> <p>Define and interpret the level of significance of a hypothesis test.</p> <p>Define and interpret the power of a hypothesis test.</p> <p>Describe the meaning of accepting the null hypothesis of a test.</p> <p>Identify and interpret the critical regions of a hypothesis test.</p> <p>Define and interpret the null and alternate hypothesis for the population mean for a large sample.</p> <p>Determine the critical values (z) necessary to perform the test to the given level of significance.</p> <p>Covert the sample test statistic (sample mean) to a standard normal value (z).</p>	<p>Teacher evaluation of:</p> <p>Student board work.</p> <p>Student responses.</p> <p>Student homework/class work assignments.</p> <p>Student group work.</p> <p>Student workbooks.</p> <p>Student notebooks/journals.</p> <p>Student quizzes/tests.</p> <p>Student presentations.</p> <p>Student performance on Study Island.</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p> <p>Graphing calculators</p> <p>Measurement tools</p> <p>Construction tools</p>

CONTENT: C. P. Statistics

CORE CONCEPT 9: Hypothesis Testing Involving One Population

MAJOR OBJECTIVE: Hypothesis Testing, Tests Involving the Mean μ in Large Samples, The P Value in Hypothesis Testing, Tests Involving the Mean μ in Small Samples, Tests Involving a Proportion

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.7.11.C</p> <p>Draw and justify a conclusion regarding the validity of a probability or statistical argument.</p>	<p>Compare the standard normal value to the critical values to determine acceptance of the null hypothesis.</p> <p>Draw a conclusion as to the statistical significance of the test.</p> <p>Determine and interpret the <i>P</i> value for tests of the population mean.</p> <p>Define and interpret the test conclusions based on the <i>P</i> values.</p> <p>Define and interpret the null and alternate hypothesis for the population mean for a small sample.</p> <p>Calculate and interpret the degrees of freedom based on the small sample size.</p> <p>Determine the critical values (<i>t</i>) necessary to perform the test to the given level of significance.</p> <p>Covert the sample test statistic (sample mean) to a standard normal value (<i>t</i>).</p> <p>Compare the standard normal value to the critical values to determine acceptance of the null hypothesis.</p> <p>Draw a conclusion as to the statistical significance of the test.</p>		

CONTENT: C. P. Statistics

CORE CONCEPT 9: Hypothesis Testing Involving One Population

MAJOR OBJECTIVE: Hypothesis Testing, Tests Involving the Mean μ in Large Samples, The P Value in Hypothesis Testing, Tests Involving the Mean μ in Small Samples, Tests Involving a Proportion

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.7.11.C</p> <p>Draw and justify a conclusion regarding the validity of a probability or statistical argument.</p>	<p>Determine and interpret the P value for tests of the population mean.</p> <p>Define and interpret the test conclusions based on the P values.</p> <p>Define and interpret the null and alternate hypothesis for the population proportion for a sample that meets the criteria for a binomial distribution.</p> <p>Determine the critical values (z) necessary to perform the test to the given level of significance.</p> <p>Covert the sample test statistic (sample proportion) to a standard normal value (z).</p> <p>Draw a conclusion as to the statistical significance of the test.</p> <p>Determine and interpret the P value for tests of the population proportion.</p> <p>Define and interpret the test conclusions based on the P values.</p>		

CONTENT: C. P. Statistics

CORE CONCEPT 10: Inferences About Differences

MAJOR OBJECTIVE: Tests Involving Paired Differences (Dependent Samples), Inferences About the Difference of Two Means (Large, Independent Samples), Inferences About the Difference of Two Proportions

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.6.11.H</p> <p>Use sampling techniques to draw inferences about large populations.</p>	<p>Teacher will guide students to:</p> <p>Define a method for creating data pairs for small dependent samples.</p> <p>Calculate the mean difference between the data pairs.</p> <p>Define and interpret the null and alternate hypothesis for the mean of the differences.</p> <p>Calculate and interpret the degrees of freedom based on the small sample size.</p> <p>Determine the critical values (t) necessary to perform the test to the given level of significance.</p> <p>Covert the sample test statistic (sample mean difference) to a standard normal value (t).</p> <p>Draw a conclusion as to the statistical significance of the test.</p> <p>Determine and interpret the <i>P</i> value for tests of the mean difference.</p> <p>Define and interpret the test conclusions based on the <i>P</i> values.</p> <p>Identify the properties of the difference of means for large independent samples.</p>	<p>Teacher evaluation of:</p> <p>Student board work.</p> <p>Student responses.</p> <p>Student homework/class work assignments.</p> <p>Student group work.</p> <p>Student workbooks.</p> <p>Student notebooks/journals.</p> <p>Student quizzes/tests.</p> <p>Student presentations.</p> <p>Student performance on Study Island.</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p> <p>Graphing calculators</p> <p>Measurement tools</p> <p>Construction tools</p>

CONTENT: C. P. Statistics

CORE CONCEPT 10: Inferences About Differences

MAJOR OBJECTIVE: Tests Involving Paired Differences (Dependent Samples), Inferences About the Difference of Two Means (Large, Independent Samples), Inferences About the Difference of Two Proportions

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.6.11.H</p> <p>Use sampling techniques to draw inferences about large populations.</p>	<p>Define and interpret the null and alternate hypothesis for the difference of means for two large independent samples.</p> <p>Determine the critical values (z) necessary to perform the test to the given level of significance.</p> <p>Covert the sample test statistic (difference of the sample means) to a standard normal value (z).</p> <p>Compare the standard normal value to the critical values to determine acceptance of the null hypothesis.</p> <p>Draw a conclusion as to the statistical significance of the test.</p> <p>Determine the critical value (z) for a given confidence level and two large independent samples.</p> <p>Calculate and interpret the error of estimate.</p> <p>Calculate and interpret the confidence interval for the difference of two population means based on two sample means of two large independent samples.</p> <p>Identify the properties of the difference of proportions for large independent samples.</p>		

CONTENT: C. P. Statistics

CORE CONCEPT 10: Inferences About Differences

MAJOR OBJECTIVE: Tests Involving Paired Differences (Dependent Samples), Inferences About the Difference of Two Means (Large, Independent Samples), Inferences About the Difference of Two Proportions

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.6.11.H</p> <p>Use sampling techniques to draw inferences about large populations.</p>	<p>Define and interpret the null and alternate hypothesis for the difference of proportions for two large independent samples.</p> <p>Determine the critical values (z) necessary to perform the test to the given level of significance.</p> <p>Covert the sample test statistic (difference of the sample proportions) to a standard normal value (z).</p> <p>Compare the standard normal value to the critical values to determine acceptance of the null hypothesis.</p> <p>Draw a conclusion as to the statistical significance of the test.</p> <p>Determine the critical value (z) for a given confidence level and two large independent samples.</p> <p>Calculate and interpret the error of estimate.</p> <p>Calculate and interpret the confidence interval for the difference of two population proportions based on two sample proportions of two large independent samples.</p>		

CONTENT: C. P. Statistics

CORE CONCEPT 10: Inferences About Differences

MAJOR OBJECTIVE: Tests Involving Paired Differences (Dependent Samples), Inferences About the Difference of Two Means (Large, Independent Samples), Inferences About the Difference of Two Proportions

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.6.11.I</p> <p>Describe the normal curve and use its properties to answer questions about sets of data that are assumed to be normally distributed.</p>	<p>Teacher will guide students to:</p> <p>Define a method for creating data pairs for small dependent samples.</p> <p>Calculate the mean difference between the data pairs.</p> <p>Define and interpret the null and alternate hypothesis for the mean of the differences.</p> <p>Calculate and interpret the degrees of freedom based on the small sample size.</p> <p>Determine the critical values (t) necessary to perform the test to the given level of significance.</p> <p>Covert the sample test statistic (sample mean difference) to a standard normal value (t).</p> <p>Draw a conclusion as to the statistical significance of the test.</p> <p>Determine and interpret the P value for tests of the mean difference.</p> <p>Define and interpret the test conclusions based on the P values.</p> <p>Identify the properties of the difference of means for large independent samples.</p>	<p>Teacher evaluation of:</p> <p>Student board work.</p> <p>Student responses.</p> <p>Student homework/class work assignments.</p> <p>Student group work.</p> <p>Student workbooks.</p> <p>Student notebooks/journals.</p> <p>Student quizzes/tests.</p> <p>Student presentations.</p> <p>Student performance on Study Island.</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p> <p>Graphing calculators</p> <p>Measurement tools</p> <p>Construction tools</p>

CONTENT: C. P. Statistics

CORE CONCEPT 10: Inferences About Differences

MAJOR OBJECTIVE: Tests Involving Paired Differences (Dependent Samples), Inferences About the Difference of Two Means (Large, Independent Samples), Inferences About the Difference of Two Proportions

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.6.11.I</p> <p>Describe the normal curve and use its properties to answer questions about sets of data that are assumed to be normally distributed.</p>	<p>Define and interpret the null and alternate hypothesis for the difference of means for two large independent samples.</p> <p>Determine the critical values (z) necessary to perform the test to the given level of significance.</p> <p>Covert the sample test statistic (difference of the sample means) to a standard normal value (z).</p> <p>Compare the standard normal value to the critical values to determine acceptance of the null hypothesis.</p> <p>Draw a conclusion as to the statistical significance of the test.</p> <p>Determine the critical value (z) for a given confidence level and two large independent samples.</p> <p>Calculate and interpret the error of estimate.</p> <p>Calculate and interpret the confidence interval for the difference of two population means based on two sample means of two large independent samples.</p> <p>Identify the properties of the difference of proportions for large independent samples.</p>		

CONTENT: C. P. Statistics

CORE CONCEPT 10: Inferences About Differences

MAJOR OBJECTIVE: Tests Involving Paired Differences (Dependent Samples), Inferences About the Difference of Two Means (Large, Independent Samples), Inferences About the Difference of Two Proportions

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.6.11.I</p> <p>Describe the normal curve and use its properties to answer questions about sets of data that are assumed to be normally distributed.</p>	<p>Define and interpret the null and alternate hypothesis for the difference of proportions for two large independent samples.</p> <p>Determine the critical values (z) necessary to perform the test to the given level of significance.</p> <p>Covert the sample test statistic (difference of the sample proportions) to a standard normal value (z).</p> <p>Compare the standard normal value to the critical values to determine acceptance of the null hypothesis.</p> <p>Draw a conclusion as to the statistical significance of the test.</p> <p>Determine the critical value (z) for a given confidence level and two large independent samples.</p> <p>Calculate and interpret the error of estimate.</p> <p>Calculate and interpret the confidence interval for the difference of two population proportions based on two sample proportions of two large independent samples.</p>		

CONTENT: C. P. Statistics

CORE CONCEPT 10: Inferences About Differences

MAJOR OBJECTIVE: Tests Involving Paired Differences (Dependent Samples), Inferences About the Difference of Two Means (Large, Independent Samples), Inferences About the Difference of Two Proportions

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.7.11.B</p> <p>Apply probability and statistics to perform an experiment involving a sample and generalize its results to the entire population.</p>	<p>Teacher will guide students to:</p> <p>Define a method for creating data pairs for small dependent samples.</p> <p>Calculate the mean difference between the data pairs.</p> <p>Define and interpret the null and alternate hypothesis for the mean of the differences.</p> <p>Calculate and interpret the degrees of freedom based on the small sample size.</p> <p>Determine the critical values (t) necessary to perform the test to the given level of significance.</p> <p>Covert the sample test statistic (sample mean difference) to a standard normal value (t).</p> <p>Draw a conclusion as to the statistical significance of the test.</p> <p>Determine and interpret the <i>P</i> value for tests of the mean difference.</p> <p>Define and interpret the test conclusions based on the <i>P</i> values.</p> <p>Identify the properties of the difference of means for large independent samples.</p>	<p>Teacher evaluation of:</p> <p>Student board work.</p> <p>Student responses.</p> <p>Student homework/class work assignments.</p> <p>Student group work.</p> <p>Student workbooks.</p> <p>Student notebooks/journals.</p> <p>Student quizzes/tests.</p> <p>Student presentations.</p> <p>Student performance on Study Island.</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p> <p>Graphing calculators</p> <p>Measurement tools</p> <p>Construction tools</p>

CONTENT: C. P. Statistics

CORE CONCEPT 10: Inferences About Differences

MAJOR OBJECTIVE: Tests Involving Paired Differences (Dependent Samples), Inferences About the Difference of Two Means (Large, Independent Samples), Inferences About the Difference of Two Proportions

CURRICULUM STANDARD:

State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.7.11.B</p> <p>Apply probability and statistics to perform an experiment involving a sample and generalize its results to the entire population.</p>	<p>Define and interpret the null and alternate hypothesis for the difference of means for two large independent samples.</p> <p>Determine the critical values (z) necessary to perform the test to the given level of significance.</p> <p>Covert the sample test statistic (difference of the sample means) to a standard normal value (z).</p> <p>Compare the standard normal value to the critical values to determine acceptance of the null hypothesis.</p> <p>Draw a conclusion as to the statistical significance of the test.</p> <p>Determine the critical value (z) for a given confidence level and two large independent samples.</p> <p>Calculate and interpret the error of estimate.</p> <p>Calculate and interpret the confidence interval for the difference of two population means based on two sample means of two large independent samples.</p> <p>Identify the properties of the difference of proportions for large independent samples.</p>		

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State Standard/Student Expectation	Specific Content	Assessments	Resources/Materials
<p>PA Standard 2.7.11.C</p> <p>Draw and justify a conclusion regarding the validity of a probability or statistical argument.</p>	<p>Teacher will guide students to:</p> <p>Define a method for creating data pairs for small dependent samples.</p> <p>Calculate the mean difference between the data pairs.</p> <p>Define and interpret the null and alternate hypothesis for the mean of the differences.</p> <p>Calculate and interpret the degrees of freedom based on the small sample size.</p> <p>Determine the critical values (t) necessary to perform the test to the given level of significance.</p> <p>Covert the sample test statistic (sample mean difference) to a standard normal value (t).</p> <p>Draw a conclusion as to the statistical significance of the test.</p> <p>Determine and interpret the P value for tests of the mean difference.</p> <p>Define and interpret the test conclusions based on the P values.</p> <p>Identify the properties of the difference of means for large independent samples.</p>	<p>Teacher evaluation of:</p> <p>Student board work.</p> <p>Student responses.</p> <p>Student homework/class work assignments.</p> <p>Student group work.</p> <p>Student workbooks.</p> <p>Student notebooks/journals.</p> <p>Student quizzes/tests.</p> <p>Student presentations.</p> <p>Student performance on Study Island.</p>	<p>Textbook resources</p> <p>Computer programs/web sites</p> <p>Journal or notebook</p> <p>Supplemental materials</p> <p>Graphing calculators</p> <p>Measurement tools</p> <p>Construction tools</p>

CONTENT: C. P. Statistics

CORE CONCEPT 10: Inferences About Differences

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V. EXPECTED LEVELS OF ACHIEVEMENT

A. Students are expected to reach the proficient level of achievement in mathematics. These skills include all of those noted in the specific content area of this curriculum.

B. Grading system this course is as follows:

Grading Scale	
A	100%-90%
B	89%-80%
C	79%-70%
D	69%-60%
F	Below 60%

C. A student's grade will be determined at the conclusion of each marking period. Progress reports will be sent home at the mid-point of each marking period for those students achieving below 70%.