FREEHOLD REGIONAL HIGH SCHOOL DISTRICT
OFFICE OF CURRICULUM AND INSTRUCTION
MATHEMATICS DEPARTMENT

AP STATISTICS

Grade Level: 10-12
Credits: 5

BOARD OF EDUCATION ADOPTION DATE:
AUGUST 31, 2009

SUPPORTING RESOURCES AVAILABLE IN DISTRICT RESOURCE SHARING
APPENDIX A: ACCOMMODATIONS AND MODIFICATIONS
APPENDIX B: ASSESSMENT EVIDENCE
APPENDIX C: INTERDISCIPLINARY CONNECTIONS
FREEHOLD REGIONAL HIGH SCHOOL DISTRICT

Board of Education

Mr. Ronald G. Lawson, President
Mr. Christopher Placitella, Vice President

Mr. William Bruno
Mr. Tom Caiazza
Mrs. Elizabeth Canario
Mr. Barry Hochberg
Mrs. Kathie Lavin
Mr. Heshy Moses
Mrs. Jennifer Sutera

Mr. James Wasser, Superintendent
Ms. Donna M. Evangelista, Assistant Superintendent for Curriculum and Instruction

Curriculum Writing Committee

Ms. Jessica Cirone
Mr. Michael Matthews
Mr. David Patterson
Mr. Michael Ramdeen

Supervisors

Ms. Elena Andreacci
Ms. Marion Conrad
Ms. Deana Farinick
Ms. Angelique Gauthier
Ms. Annette Kinsley
Ms. Theresa Morales
Course Philosophy

The purpose of the AP Statistics course is to introduce students to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. Modern technology provides a mechanism for the simulation and analysis of data.

Through the study of statistics, students will expand their understanding of mathematics and acquire tools that will help them to be effective problem solvers in a variety of fields. Given that statistics is used in myriad disciplines, an understanding of introductory concepts is vital for success at the university level and beyond. In addition, this statistics curriculum will cover all topics suggested by the College Board and provide students the background and preparation necessary to be successful on the AP Exam.

Course Description

The AP Statistics course will introduce students to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. Students are exposed to four broad conceptual themes: exploring data, sampling and experimentation, probability and simulation, and statistical inference. Students will use a TI-83/84 graphing calculator, Fathom and Minitab statistical software, and Web-based java applets to investigate statistical concepts. To develop effective statistical communication skills, students are required to prepare frequent written and oral analyses of real data. In addition to the preparation for the AP Exam, students will be required to complete research-based projects using the skills that they have acquired throughout the year.
# Curriculum Map

## Advanced Placement Statistics

<table>
<thead>
<tr>
<th>Relevant Standards</th>
<th>Enduring Understandings</th>
<th>Essential Questions</th>
<th>Assessments</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.5 B1-4</td>
<td>Data can be represented using a variety of numerical and graphical methods.</td>
<td>What is data? Are there different types of data? What are the numerical methods for data representation? What are the graphical methods for data representation?</td>
<td>Pretest</td>
</tr>
<tr>
<td>4.5 A1-5</td>
<td>Regression is an instrument used to generalize relationships for bivariate data.</td>
<td>What is regression? What is bivariate data? How well does data fit a regression model? What are the properties of a linear regression model? How can non-linear data be linearized for regression?</td>
<td>Math Journals</td>
</tr>
<tr>
<td>4.5 E1, 3</td>
<td>A density curve is used to mimic probability.</td>
<td>What is a density curve? How do density curves relate to probability? How are measures of central tendency relevant to density curves? How can density curves be used to express relative standing?</td>
<td>Oral Questions/Discussion</td>
</tr>
<tr>
<td>4.3 B4</td>
<td>The normal distribution is used to model the spread of data.</td>
<td>What is a normal distribution? How does one assess normality? What does a normal distribution imply about the spread of data? Why is the normal distribution essential to the study of statistics?</td>
<td>Anticipatory Set Questions</td>
</tr>
<tr>
<td>4.2 A1</td>
<td>Proper collection of data is essential for good experimental design.</td>
<td>What is an experiment? What are the different sampling methods? How can causation be established? How does bias affect experimental design?</td>
<td>Math Journals</td>
</tr>
<tr>
<td>4.2 A5; B5</td>
<td>Probability is a tool for measuring long-term behavior.</td>
<td>What is probability? How can probability be simulated? What is a probability distribution? How does one determine probability for a given event?</td>
<td>Math Journals</td>
</tr>
<tr>
<td>4.5 A1-5; B1-4</td>
<td>Inference is a tool for estimating an unknown population parameter.</td>
<td>What does it mean to make an inference? What is a confidence interval? How does one distinguish among the various confidence intervals?</td>
<td>Math Journals</td>
</tr>
<tr>
<td>4.4 A2</td>
<td>Inference is a tool for validating a claim about a population parameter.</td>
<td>What is a test of significance? How is a test of significance done? How does one distinguish among the various tests of significance?</td>
<td>Math Journals</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Diagnostic (before)</th>
<th>Formative (during)</th>
<th>Summative (after)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>Math Journals</td>
<td>Portfolios</td>
</tr>
<tr>
<td>Oral Questions/Discussion</td>
<td>Oral Presentations</td>
<td>Chapter Test</td>
</tr>
<tr>
<td>Anticipatory Set Questions</td>
<td>Observations</td>
<td>Mid Terms</td>
</tr>
<tr>
<td>Math Journals</td>
<td>Projects</td>
<td>Chapter Test</td>
</tr>
<tr>
<td>Math Journals</td>
<td>Project</td>
<td>Final Exam</td>
</tr>
<tr>
<td>Math Journals</td>
<td>Assignments</td>
<td>Final Exam</td>
</tr>
<tr>
<td>Math Journals</td>
<td>Closure Questions</td>
<td>Final Exam</td>
</tr>
<tr>
<td>Math Journals</td>
<td>Investigative Activities</td>
<td>Final Exam</td>
</tr>
<tr>
<td>Math Journals</td>
<td>Sample AP Exam Questions</td>
<td>Final Exam</td>
</tr>
<tr>
<td>Relevant Standards</td>
<td>Enduring Understandings</td>
<td>Essential Questions</td>
</tr>
<tr>
<td>-------------------</td>
<td>-------------------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>4.5 A1-5; B1-4; C1-6</td>
<td>Statistics can be applied to many different disciplines and fields.</td>
<td>How is statistics used in your current courses? What are some examples of statistics used in real life? How can one apply various statistical techniques to analyze results when working on a novel research project?</td>
</tr>
<tr>
<td>4.4 A5 4.5 A1-5; B1-4; F1-4</td>
<td>Technology is instrumental to the study of statistics in an interactive classroom.</td>
<td>What types of technology can be used to study statistics? Why is technology useful to the study of statistics?</td>
</tr>
<tr>
<td>Unit Title</td>
<td>Unit Understandings and Goals</td>
<td>Recommended Duration</td>
</tr>
<tr>
<td>------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>Unit #1: Exploring Data:</td>
<td>Data can be represented using a variety of numerical and graphical methods. Technology is instrumental to the study of statistics in an interactive classroom. Statistics can be applied to many different disciplines and fields.</td>
<td>2 weeks</td>
</tr>
</tbody>
</table>
|                                    | 1. Students will describe the distribution for any given data set of one variable.  
|                                    | 2. Students will interpret numerical and graphical summaries in the context of the situation.                                                                                                                                  |                      |
| Unit #2: Describing Location in a Distribution | A density curve is used to mimic probability. The normal distribution is used to model the spread of data.                                                                                                                         | 2 weeks              |
|                                    | 1. Students will compute measures of relative standing for individual values in a distribution.  
|                                    | 2. Students will demonstrate an understanding of a density curve and Normal distributions.                                                                                                                                     |                      |
| Unit #3: Examining Relationships   | Regression is an instrument used to generalize relationships for bivariate data.                                                                                                                                               | 4 weeks              |
|                                    | 1. Given a bivariate data set, students will construct and interpret a regression line.  
|                                    | 2. Students will demonstrate an understanding of the quality of the regression line as the model for bivariate data.                                                                                                            |                      |
|                                    | 3. Students will use transformations to linearize curved relationships for regression.                                                                                                                                            |                      |
| Unit #4: Producing Data            | Proper collection of data is essential for good experimental design.                                                                                                                                                          | 2 weeks              |
|                                    | 1. Students will identify and implement appropriate types of sampling methods.  
|                                    | 2. Students will identify and give examples of sources of bias.  
|                                    | 3. Students will be able to recognize and construct a well-designed experiment.                                                                                                                                               |                      |
| Unit #5: Probability and Simulations | Probability is a tool for measuring long-term behavior.                                                                                                                                                                       | 2 weeks              |
|                                    | 1. Students will use simulation to calculate probabilities.  
|                                    | 2. Students will understand and apply the laws of probability                                                                                                                                                            |                      |
| Unit #6: Random Variables          | Probability is a tool for measuring long-term behavior.                                                                                                                                                                       | 3 weeks              |
|                                    | 1. Students will differentiate between discrete and continuous random variables.  
|                                    | 2. Students will explain the probability distribution for random variables, including binomial and geometric distributions                                                                                                   |                      |
| Unit #7: Sampling Distributions | The normal distribution is used to model the spread of data. A density curve is used to mimic probability.  
1. Students will be able to interpret a sampling distribution for means.  
2. Students will be able to interpret a sampling distribution for proportions. | 3 weeks |
| Unit #8: Estimating with Confidence | Inference is a tool for estimating an unknown population parameter.  
1. Students will be able to determine a confidence interval for means.  
2. Students will be able to determine a confidence interval for proportions. | 3 weeks |
| Unit #9: Significance Testing for One Population | Inference is a tool for validating a claim about a population parameter.  
1. Students will be able to carry out a test of significance for a population mean.  
2. Students will be able to carry out a test of significance for a population proportion. | 3 weeks |
| Unit #10: Comparing Two Population Parameters | Inference is a tool for validating a claim about a population parameter.  
Inference is a tool for estimating an unknown population parameter.  
1. Students will be able to compare two population means and proportions using confidence intervals.  
2. Students will be able to compare two population means and proportions using tests of significance. | 2 weeks |
| Unit #11: Inference for Distributions of Categorical Variables | Inference is a tool for validating a claim about a population parameter.  
1. Students will be able to perform a test for goodness of fit using a two-way table.  
2. Students will be able to perform a chi-square test of significance. | 1 week |
| Unit #12: Inference for Regressions | Regression is an instrument used to generalize relationships for bivariate data.  
Inference is a tool for validating a claim about a population parameter.  
1. Students will be able to create a confidence interval for the slope of a regression line.  
2. Students will be able to test the hypothesis of a linear relationship of the regression line. | 2 week |
| Unit #13: Post Advanced Placement Exam | Statistics can be applied to many different disciplines and fields. Technology is instrumental to the study of statistics in an interactive classroom.  
1. Students will demonstrate understanding of concepts covered throughout the year via a year end project.  
2. Students will incorporate appropriate technology to augment and facilitate calculations necessary for statistical summaries. | 5 weeks |
Freehold Regional High School District
Advanced Placement Statistics

Unit #1: Exploring Data

Enduring Understandings:
- Data can be represented using a variety of numerical and graphical methods.
- Technology is instrumental to the study of statistics in an interactive classroom.
- Statistics can be applied to many different disciplines and fields.

Essential Questions:
- What is data?
- Are there different types of data?
- What are the numerical and graphical methods for data representation?
- What types of technology can be used to study statistics?
- Why is technology useful to the study of statistics?
- How is statistics used in your current courses?
- What are some examples of statistics used in real life?

Unit Goals:
- Students will describe the distribution for any given data set of one variable.
- Students will interpret numerical and graphical summaries in the context of the situation.

Duration of Unit: 2 weeks
NJCCCS: 4.4 A5; 4.5 A1-5; 4.5 B1-4; 4.5 C1-6; 4.5 E1, 3; 4.5 F1-4

<table>
<thead>
<tr>
<th>Guiding / Topical Questions</th>
<th>Content, Themes, Concepts, and Skills</th>
<th>Instructional Resources and Materials</th>
<th>Teaching Strategies</th>
<th>Assessment Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the difference between categorical and quantitative variables?</td>
<td>Categorical variables place an individuals into one of several groups. Quantitative variables take numerical values.</td>
<td>Current textbook and resource binders.</td>
<td>Lecture and class discussion.</td>
<td>Written tests and quizzes.</td>
</tr>
<tr>
<td>How can categorical and quantitative variables be represented graphically?</td>
<td>Categorical variables can be represented by bar graphs and pie charts. Quantitative variables can be represented by histograms, stemplots, box plots, relative frequency histograms, and ogives.</td>
<td>Statistical websites - see attachment. Magazine articles. Newspapers. Videos (Against all odds). Previous AP Exam questions.</td>
<td>Complete the chapter study guides. Complete the online quizzes from the text’s website.</td>
<td>Worksheets. Project assessments.</td>
</tr>
<tr>
<td>How are distributions compared?</td>
<td>Use numerical and graphical summaries to compare data sets.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What is the effect of linear transformations on a data set?</td>
<td>When adding a constant to all values of a data set, the mean and median increase by that value, but spread is not affected. When multiplying all values of data set by a constant, the mean, median, IQR and standard deviation are all multiplied by that constant.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How can data be analyzed using technology?</td>
<td>Data can be imputed and manipulated using the LIST feature. Numerical representations can be found using 1-var stats. Graphical representations can be found using stat-plot.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suggestions on how to differentiate in this unit:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Teaching methods will be diversified to appeal to visual, auditory and kinesthetic learners</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Students will be given copies of data sets and other important notes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Students will be assessed by traditional and alternative methods</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Students will work individually, with partners and in small groups on certain activities</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Freehold Regional High School District  
Advanced Placement Statistics  

Unit #2: Describing Location within a Distribution

Enduring Understandings:  
A density curve is used to mimic probability.  
The normal distribution is used to model the spread of data.

Essential Questions:  
What is a density curve?  
How do density curves relate to probability?  
How are measures of central tendency relevant to density curves?  
How can density curves be used to express relative standing?  
What is a normal distribution?  
How does one assess normality?  
What does a normal distribution imply about the spread of data?

Unit Goals:  
Students will compute measures of relative standing for individual values in a distribution  
Students will demonstrate an understanding of a density curve and Normal distributions.

Duration of Unit: 2 weeks  
NJCCCS: 4.2 A1; 4.4 A5; 4.4 B5; 4.5 A1-5; 4.5 B1-4

<table>
<thead>
<tr>
<th>Guiding / Topical Questions</th>
<th>Content, Themes, Concepts, and Skills</th>
<th>Instructional Resources and Materials</th>
<th>Teaching Strategies</th>
<th>Assessment Strategies</th>
</tr>
</thead>
</table>
| How do you measure relative standing? | Relative standing can be found by computing the standardized value (z-score)  
Relative standing can also be discussed as a percentile. | Current textbook and resource binders  
Statistical websites - see attachment  
Magazine articles  
Newspapers  
Videos (Against all odds)  
Previous AP Exam questions  
Statistical Applets  
Graphing Calculator (normcdf)  
SMART Board  
Power Point Reviews | Lecture and class discussion  
Complete the chapter study guides  
Complete the online quizzes from the text’s website.  
M&M activities  
Case Closed Projects  
Alternative Assessment  
Previous AP Exam questions  
Jigsaw  
Review Relay | Written tests and quizzes  
Worksheets  
Project assessments  
Article summaries  
Anticipatory sets  
Classroom discussion  
Closure questions |
| What is a density curve? | A density curve is an approximation of the overall shape of a distribution.  
The area underneath a density is exactly 1. | | | |
| How can the mean and median be approximated on a density curve? | The median of a density curve is the “equal-areas” point that divides the area under the curve in half.  
The mean of a density curve is the “balance point,” at which the curve would balance if made of solid material. | | | |
| What is a Normal distribution? | A Normal distribution is a density curve that is symmetric, single-peaked, and bell-shaped.  
All Normal distributions follow 68-95-99.7 Rule. | | | |
| What is a standard Normal distribution? | A standard Normal distribution has a mean of zero and a standard deviation of one. N(0, 1)  
The proportion of observations can be found using the z-table and the graphing calculator (normcdf) | | | |
| For a Normal distribution, what is the value associated with a specific proportion? | The value for a given proportion can be found using the z-table or the graphing calculator (invNorm) | | | |
| How can Normality be assessed? | Normality can be assessed by comparing the count of observations in each interval with the 68-95-99.7 Rule  
Normal probability plots can also be used to assess Normality. | | | |
**Suggestions on how to differentiate in this unit:**

- Teaching methods will be diversified to appeal to visual, auditory and kinesthetic learners
- Students will be given copies of data sets and other important notes
- Students will be assessed by traditional and alternative methods
- Students will work individually, with partners and in small groups on certain activities
### Enduring Understanding:
Regression is an instrument used to generalize relationships for bivariate data.

### Essential Questions:
- What is regression?
- What is bivariate data?
- How well does data fit a regression model?
- What are the properties of a linear regression model?
- How can non-linear data be linearized for regression?

### Unit Goals:
- Students will construct and interpret a regression line given a bivariate data set.
- Students will demonstrate an understanding of the quality of the regression line as the model for bivariate data.
- Students will use transformations to linearize curved relationships for regression.

### Duration of Unit: 4 weeks
NJCCCS: 4.3 B4; 4.3 C1, 2; 4.4 A4, 5; 4.5 A1-5; 4.5 B1-4; 4.5 C1; 4.5 E2

<table>
<thead>
<tr>
<th>Guiding / Topical Questions</th>
<th>Content, Themes, Concepts, and Skills</th>
<th>Instructional Resources and Materials</th>
<th>Teaching Strategies</th>
<th>Assessment Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the difference between response and explanatory variables?</td>
<td>A response variable measures an outcome of a study. An explanatory variable helps explain or influences changes in a response variable.</td>
<td>Current textbook and resource binders Statistical websites - see attachment Magazine articles Newspapers Videos (Against all odds) Previous AP Exam questions Statistical Applets Graphing Calculator SMART Board Power Point Reviews</td>
<td>Lecture and class discussion Complete the chapter study guides Complete the online quizzes from the text’s website M&amp;M activities Case Closed Projects Alternative Assessment Previous AP Exam questions Jigsaw Review Relay</td>
<td>Written tests and quizzes Worksheets Project assessments Article summaries Anticipatory sets Classroom discussion Closure questions</td>
</tr>
<tr>
<td>How do you graphically represent and interpret bivariate data?</td>
<td>Scatterplots can be used to find the overall pattern and striking deviations of bivariate data.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How is a linear association measured?</td>
<td>Correlation measures the direction and strength of a linear relationship.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How can a regression line be used as a mathematical model?</td>
<td>The Least Squares Regression Line (LSRL) describes how a response variable changes as an explanatory variable changes.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How well does data fit a linear regression model?</td>
<td>A residual plot and the coefficient of determination are used to assess the appropriateness of the regression model.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What are the cautions regarding regression?</td>
<td>Extrapolation may not be accurate for values outside of the given data set. Lurking variables may influence the interpretation of the relationship between the two variables.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How do you transform data to achieve linearity?</td>
<td>Powers and Logarithms can be employed to one or both variable to linearize the relationship between the variables.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How are the relationships between categorical variables described?</td>
<td>Marginal and conditional distributions are used to describe relationships between categorical variables.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How is an associated between two variables explained?</td>
<td>Causation, common response, and confounding are three ways that can explain the association.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Guiding / Topical Questions
- What is regression?
- What is bivariate data?
- How well does data fit a regression model?
- What are the properties of a linear regression model?
- How can non-linear data be linearized for regression?

### Content, Themes, Concepts, and Skills
- A response variable measures an outcome of a study.
- An explanatory variable helps explain or influences changes in a response variable.
- Scatterplots can be used to find the overall pattern and striking deviations of bivariate data.
- Correlation measures the direction and strength of a linear relationship.
- The Least Squares Regression Line (LSRL) describes how a response variable changes as an explanatory variable changes.
- A residual plot and the coefficient of determination are used to assess the appropriateness of the regression model.
- Extrapolation may not be accurate for values outside of the given data set.
- Lurking variables may influence the interpretation of the relationship between the two variables.
- Powers and Logarithms can be employed to one or both variable to linearize the relationship between the variables.
- Marginal and conditional distributions are used to describe relationships between categorical variables.
- Causation, common response, and confounding are three ways that can explain the association.

### Instructional Resources and Materials
- Current textbook and resource binders
- Statistical websites - see attachment
- Magazine articles
- Newspapers
- Videos (Against all odds)
- Previous AP Exam questions
- Statistical Applets
- Graphing Calculator
- SMART Board
- Power Point Reviews

### Teaching Strategies
- Lecture and class discussion
- Complete the chapter study guides
- Complete the online quizzes from the text’s website
- M&M activities
- Case Closed Projects
- Alternative Assessment
- Previous AP Exam questions
- Jigsaw Review Relay

### Assessment Strategies
- Written tests and quizzes
- Worksheets
- Project assessments
- Article summaries
- Anticipatory sets
- Classroom discussion
- Closure questions
<table>
<thead>
<tr>
<th>Suggestions on how to differentiate in this unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Teaching methods will be diversified to appeal to visual, auditory and kinesthetic learners</td>
</tr>
<tr>
<td>• Students will be given copies of data sets and other important notes</td>
</tr>
<tr>
<td>• Students will be assessed by traditional and alternative methods</td>
</tr>
<tr>
<td>• Students will work individually, with partners and in small groups on certain activities</td>
</tr>
</tbody>
</table>
Freehold Regional High School District
Advanced Placement Statistics

Unit #4: Producing Data

**Enduring Understanding:**
Proper collection of data is essential for good experimental design.

**Essential Questions:**
What is an experiment? What are the different sampling methods? How can causation be established? How does bias affect experimental design?

**Unit Goals:**
- Students will identify and implement appropriate types of sampling methods.
- Students will identify and give examples of sources of bias.
- Students will be able to recognize and construct a well-designed experiment.

**Duration of Unit:** 2 weeks

**NJCCCS:** 4.4 A1-3; 4.5 A1-5; 4.5 B1-4

<table>
<thead>
<tr>
<th>Guiding / Topical Questions</th>
<th>Content, Themes, Concepts, and Skills</th>
<th>Instructional Resources and Materials</th>
<th>Teaching Strategies</th>
<th>Assessment Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the difference between an observational study and an experiment?</td>
<td>An observation study observes individuals and measures variables of interest. An experiment deliberately imposes a treatment on individuals.</td>
<td>Current textbook and resource binders Statistical websites - see attachment Magazine articles Newspapers Videos (Against all odds) Previous AP Exam questions</td>
<td>Lecture and class discussion Complete the chapter study guides Complete the online quizzes from the text’s website. M&amp;M activities Jigsaw Case Closed Projects Alternative Assessment Previous AP Exam questions Turkey-trot Olympics Review Relay</td>
<td>Written tests and quizzes Worksheets Project assessments Article summaries Anticipatory sets Classroom discussion Closure questions</td>
</tr>
<tr>
<td>What are the different sampling methods?</td>
<td>Voluntary response, convenience, simple-random (SRS), probability, stratified random, and cluster are several different sampling methods.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What cautions about sample surveys exist?</td>
<td>Some cautions include response bias, undercoverage, nonresponse, and question wording.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What are the parts of a well-designed experiment?</td>
<td>The components include experimental units, treatment, factors, levels, and conclusions. The basic principles of experimental design are control, replicate, and randomize.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What are some different types of experimental design?</td>
<td>Blocking, matched-pairs, and completely randomized are types of experimental design.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What cautions about experimentation exist?</td>
<td>Lack of realism and the placebo effect can prevent generalizations of the results. Double-blind experiments help avoid unconscious bias, such as the placebo effect.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Suggestions on how to differentiate in this unit:**
- Teaching methods will be diversified to appeal to visual, auditory and kinesthetic learners
- Students will be given copies of data sets and other important notes
- Students will be assessed by traditional and alternative methods
- Students will work individually, with partners and in small groups on certain activities
Enduring Understanding:
Probability is a tool for measuring long-term behavior.

Essential Questions:
What is probability?
How can probability be simulated?
What is a probability distribution?
How does one determine probability for a given event?

Unit Goals:
Students will use simulation to calculate probabilities.
Students will understand and apply the laws of probability

Duration of Unit: 2 weeks

NJCCCS: 4.4 B1-6; 4.4 C1, 2; 4.5 A1-5; 4.5 B1-4

<table>
<thead>
<tr>
<th>Guiding / Topical Questions</th>
<th>Content, Themes, Concepts, and Skills</th>
<th>Instructional Resources and Materials</th>
<th>Teaching Strategies</th>
<th>Assessment Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>How can simulations be used to model probability?</td>
<td>Simulation is the imitation of chance behavior based on a model that accurately reflects the phenomenon.</td>
<td>Current textbook and resource binders Statistical websites - see attachment Magazine articles Newspapers Videos (Against all odds) Previous AP Exam questions Statistical Applets Graphing Calculator SMART Board Power Point Reviews</td>
<td>Lecture and class discussion Complete the chapter study guides Complete the online quizzes from the text’s website. M&amp;M activities Jigsaw Case Closed Projects Alternative Assessment Previous AP Exam questions Review Relay</td>
<td>Written tests and quizzes Worksheets Project assessments Article summaries Anticipatory sets Classroom discussion Closure questions</td>
</tr>
<tr>
<td>How are simulations conducted?</td>
<td>Simulations are conducted using the five-step process along with the random digits table or random number generator from the graphing calculator.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What is probability?</td>
<td>Probability is the long-term relative frequency of a random event.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What is a probability model?</td>
<td>A probability model consists of all possible outcomes of a random phenomenon and a way of assigning probabilities to those outcomes.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What are the general probability rules?</td>
<td>Probability of any event is always a number between 0 and 1, and the sum of all the probabilities of a distribution equals 1. For disjoint events, the probability of the sum of the events is the sum of the probabilities of each event. The probability of the intersection of two events is the product of their conditional probabilities. For any event, the probability of an event not occurring is 1 minus the probability of the event occurring.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Suggestions on how to differentiate in this unit:
- Teaching methods will be diversified to appeal to visual, auditory and kinesthetic learners
- Students will be given copies of data sets and other important notes
- Students will be assessed by traditional and alternative methods
- Students will work individually, with partners and in small groups on certain activities
### Enduring Understanding:
Probability is a tool for measuring long-term behavior.

### Essential Questions:
- What is a probability distribution?
- How can probability be simulated?
- How does one determine probability for a given event?

### Unit Goals:
Students will differentiate between discrete and continuous random variables.
Students will explain the probability distribution for random variables, including binomial and geometric distributions.

### Duration of Unit:
3 weeks

**NJCCCS:** 4.4 B1-6; 4.4 C1, 2; 4.5 A1-5; 4.5 B1-4

<table>
<thead>
<tr>
<th>Guiding / Topical Questions</th>
<th>Content, Themes, Concepts, and Skills</th>
<th>Instructional Resources and Materials</th>
<th>Teaching Strategies</th>
<th>Assessment Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is a random variable?</td>
<td>Define both discrete and continuous random variables.</td>
<td>Current textbook and resource binders</td>
<td>Lecture and class discussion</td>
<td>Written tests and quizzes</td>
</tr>
<tr>
<td>What is a probability distribution for a random variable?</td>
<td>Show the construction of a discrete probability distribution. Apply the formulas for mean and standard deviation.</td>
<td>Statistical websites - see attachment Magazine articles Newspapers</td>
<td>Student investigation activities Complete the chapter study guides Create posters and/or power point presentations Use whiteboards to show immediate feedback. Use worksheets to reinforce concepts.</td>
<td>Worksheets Project assessments Notebook assessments Responses to discussion questions Journal assessments</td>
</tr>
<tr>
<td>What is demonstrated by the law of large numbers?</td>
<td>Explain the law of large numbers in terms of long term expectations.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What is a binomial distribution?</td>
<td>Establish the settings of a binomial experiment. Calculate binomial probabilities by applying relevant formulas.</td>
<td>Videos (Against all odds)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>What is a geometric distribution?</td>
<td>Establish the settings of a geometric experiment. Calculate geometric probabilities by applying relevant formulas.</td>
<td>Previous AP Exam questions Statistical Applets Graphing Calculator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How does one use known means and standard deviations to compute the mean and standard deviation for a combination of variables.</td>
<td>Apply the formulas for calculating combined means and standard deviation for both independent and dependent variables.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Suggestions on how to differentiate in this unit:**
- Teaching methods will be diversified to appeal to visual, auditory and kinesthetic learners
- Students will be given copies of data sets and other important notes
- Students will be assessed by traditional and alternative methods
- Students will work individually, with partners and in small groups on certain activities
Freehold Regional High School District
Advanced Placement Statistics

Unit #7: Sampling Distributions

**Enduring Understandings:**
- The normal distribution is used to model the spread of data.
- A density curve is used to mimic probability.

**Essential Questions:**
- Why is the normal distribution important to the study of statistics?
- How does one assess normality?
- What does the normal distribution imply about the spread of data?

**Unit Goals:**
- Students will be able to interpret a sampling distribution for means.
- Students will be able to interpret a sampling distribution for proportions.

**Duration of Unit:** 3 weeks

**NJCCCS:** 4.2 A1; 4.4 A5; 4.4 B5; 4.5 A1-5; 4.5 B1-4

<table>
<thead>
<tr>
<th>Guiding / Topical Questions</th>
<th>Content, Themes, Concepts, and Skills</th>
<th>Instructional Resources and Materials</th>
<th>Teaching Strategies</th>
<th>Assessment Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is a sampling distribution?</td>
<td>Understand the properties of a sampling distribution.</td>
<td>Current textbook and resource binders</td>
<td>Lecture and class discussion</td>
<td>Written tests and quizzes</td>
</tr>
<tr>
<td>How does one compute the mean and standard deviation for a sample proportion?</td>
<td>Apply appropriate formulas for sample proportions.</td>
<td>Statistical websites - see attachment</td>
<td>Student investigation activities</td>
<td>Worksheets</td>
</tr>
<tr>
<td>When does one use a normal approximation to the sampling proportion?</td>
<td>Establish conditions for normal approximation to the sampling proportion.</td>
<td>Magazine articles</td>
<td>Complete the chapter study guides</td>
<td>Project assessments</td>
</tr>
<tr>
<td>How does one compute the mean and standard deviation for a sampling distribution of means?</td>
<td>Apply appropriate formulas for sampling distribution of means.</td>
<td>Newspapers, Videos (Against all odds)</td>
<td>Create posters and/or power point presentations</td>
<td>Notebook assessments</td>
</tr>
<tr>
<td>What is the Central Limit Theorem?</td>
<td>Define Central Limit Theorem.</td>
<td>Previous AP Exam questions</td>
<td>Use whiteboards to show immediate feedback.</td>
<td>Responses to discussion questions</td>
</tr>
<tr>
<td>How is the Central Limit Theorem applied to sampling distributions?</td>
<td>Establish conditions for the application of the Central Limit Theorem.</td>
<td>Statistical Applets, Graphing Calculator</td>
<td>Use worksheets to reinforce concepts.</td>
<td>Journal assessments</td>
</tr>
</tbody>
</table>

**Suggestions on how to differentiate in this unit:**
- Teaching methods will be diversified to appeal to visual, auditory and kinesthetic learners
- Students will be given copies of data sets and other important notes
- Students will be assessed by traditional and alternative methods
- Students will work individually, with partners and in small groups on certain activities
Freehold Regional High School District  
Advanced Placement Statistics  

Unit #8: Estimating with Confidence

Enduring Understanding:  
Inference is a tool for estimating an unknown population parameter.

Essential Questions:  
What does it mean to make an inference?  
What is a confidence interval?  
How does one distinguish among the various confidence intervals?

Unit Goals:  
Students will be able to determine a confidence interval for means.  
Students will be able to determine a confidence interval for proportions.

Duration of Unit:  3 weeks  
NJCCCS: 4.4 A2; 4.5 A1-5; 4.5 B1-4; 4.5 D1-6

<table>
<thead>
<tr>
<th>Guiding / Topical Questions</th>
<th>Content, Themes, Concepts, and Skills</th>
<th>Instructional Resources and Materials</th>
<th>Teaching Strategies</th>
<th>Assessment Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is a confidence interval?</td>
<td>Define a confidence interval.</td>
<td>Current textbook and resource binders</td>
<td>Lecture and class discussion</td>
<td>Written tests and quizzes</td>
</tr>
<tr>
<td>How does one construct a confidence interval?</td>
<td>Distinguish between a point estimate and an interval estimate</td>
<td>Statistical websites - see attachment</td>
<td>Student investigation activities</td>
<td>Worksheets</td>
</tr>
<tr>
<td>What is a margin of error?</td>
<td>Calculate margin or error using appropriate formula.</td>
<td>Magazine articles</td>
<td>Complete the chapter study guides</td>
<td>Project assessments</td>
</tr>
<tr>
<td>How does one distinguish between using the normal or the t distribution?</td>
<td>Establish conditions necessary for each distribution.</td>
<td>Newspapers</td>
<td>Create posters and/or power point presentations</td>
<td>Notebook assessments</td>
</tr>
<tr>
<td>What conditions must be present to construct a confidence interval for a population mean or proportion?</td>
<td>Identify the conditions necessary to distinguish each type of confidence interval.</td>
<td>Videos (Against all odds)</td>
<td>Use whiteboards to show immediate feedback.</td>
<td>Responses to discussion questions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Previous AP Exam questions</td>
<td>Use worksheets to reinforce concepts.</td>
<td>Journal assessments</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Statistical Applets</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Graphing Calculator</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Suggestions on how to differentiate in this unit:  
• Teaching methods will be diversified to appeal to visual, auditory and kinesthetic learners  
• Students will be given copies of data sets and other important notes  
• Students will be assessed by traditional and alternative methods  
• Students will work individually, with partners and in small groups on certain activities
## Freehold Regional High School District
### Advanced Placement Statistics

### Unit #9: Significance Testing for One Population

**Enduring Understanding:**
Inference is a tool for validating a claim about a population parameter.

**Essential Questions:**
- What is a test of significance?
- How is a test of significance done?
- How does one distinguish among the various tests of significance?

**Unit Goals:**
- Students will be able to carry out a test of significance for a population mean.
- Students will be able to carry out a test of significance for a population proportion.

**Duration of Unit:** 3 weeks

**NJCCCS:**
- 4.4 A2; 4.5 A1-5; 4.5 B1-4; 4.5 D1-6

### Guiding / Topical Questions

<table>
<thead>
<tr>
<th>Guiding / Topical Questions</th>
<th>Content, Themes, Concepts, and Skills</th>
<th>Instructional Resources and Materials</th>
<th>Teaching Strategies</th>
<th>Assessment Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is a test of significance?</td>
<td>Define a test of significance.</td>
<td>Current textbook and resource binders</td>
<td>Lecture and class discussion</td>
<td>Written tests and quizzes</td>
</tr>
<tr>
<td>How does one determine significance?</td>
<td>Define level of significance and use it to make a decision about the null hypothesis.</td>
<td>Statistical websites - see attachment</td>
<td>Student investigation activities</td>
<td>Worksheets</td>
</tr>
<tr>
<td>What are the steps to execute a test of significance for a population mean?</td>
<td>Establish a systematic procedure for a test of significance for a population mean.</td>
<td>Magazine articles</td>
<td>Complete the chapter study guides</td>
<td>Project assessments</td>
</tr>
<tr>
<td>What are the steps to execute a test of significance for a population proportion?</td>
<td>Establish a systematic procedure for a test of significance for a population proportion.</td>
<td>Newspapers</td>
<td>Create posters and/or power point presentations</td>
<td>Notebook assessments</td>
</tr>
<tr>
<td>What is the difference between a one-tailed and a two-tailed significance test?</td>
<td>Explain the different types of tests and the conditions necessary for each.</td>
<td>Videos (Against all odds)</td>
<td>Use whiteboards to show immediate feedback.</td>
<td>Responses to discussion questions</td>
</tr>
<tr>
<td>What are the different types of error?</td>
<td>Define Type I and Type II errors and the power of the test.</td>
<td>Previous AP Exam questions</td>
<td>Use worksheets to reinforce concepts.</td>
<td>Journal assessments</td>
</tr>
</tbody>
</table>

**Suggestions on how to differentiate in this unit:**
- Teaching methods will be diversified to appeal to visual, auditory and kinesthetic learners
- Students will be given copies of data sets and other important notes
- Students will be assessed by traditional and alternative methods
- Students will work individually, with partners and in small groups on certain activities
Freehold Regional High School District  
Advanced Placement Statistics

Unit #10: Comparing Two Population Parameters

**Enduring Understandings:**
- Inference is a tool for validating a claim about a population parameter.
- Inference is a tool for estimating an unknown population parameter.

**Essential Questions:**
- How does one distinguish among the various confidence intervals?
- How does one distinguish among the various tests of significance?

**Unit Goals:**
- Students will be able to compare two population means and proportions using confidence intervals.
- Students will be able to compare two population means and proportions using tests of significance.

**Duration of Unit:** 2 weeks

**NJCCCS:** 4.4 A2; 4.5 A1-5; 4.5 B1-4; 4.5 D1-6

<table>
<thead>
<tr>
<th>Guiding / Topical Questions</th>
<th>Content, Themes, Concepts, and Skills</th>
<th>Instructional Resources and Materials</th>
<th>Teaching Strategies</th>
<th>Assessment Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is inference for comparing two populations?</td>
<td>Distinguish between inference using confidence intervals as opposed to tests of significance.</td>
<td>Current textbook and resource binders</td>
<td>Lecture and class discussion</td>
<td>Written tests and quizzes</td>
</tr>
<tr>
<td>How does one compute a confidence interval for two population means?</td>
<td>Apply the appropriate formula for confidence intervals of population means using both the z statistic and the t statistic.</td>
<td>Statistical websites - see attachment</td>
<td>Student investigation activities</td>
<td>Worksheets</td>
</tr>
<tr>
<td>How does one execute a test of significance for two population means?</td>
<td>Apply the appropriate formula for significance tests of population means using both the z statistic and the t statistic to find the p value.</td>
<td>Magazine articles Newspapers Videos (Against all odds) Previous AP Exam questions</td>
<td>Complete the chapter study guides Create posters and/or power point presentations Use whiteboards to show immediate feedback. Use worksheets to reinforce concepts.</td>
<td>Project assessments Notebook assessments Responses to discussion questions Journal assessments</td>
</tr>
<tr>
<td>How does one compute a confidence interval for two population proportions?</td>
<td>Apply the appropriate formula for confidence intervals of population proportions using both the z statistic and the t statistic.</td>
<td>Statistical Applets Graphing Calculator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How does one execute a test of significance for two population proportions?</td>
<td>Apply the appropriate formula for significance tests of population proportions using both the z statistic and the t statistic to find the p value.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Suggestions on how to differentiate in this unit:**
- Teaching methods will be diversified to appeal to visual, auditory and kinesthetic learners
- Students will be given copies of data sets and other important notes
- Students will be assessed by traditional and alternative methods
- Students will work individually, with partners and in small groups on certain activities
Unit #11: Inference for Distributions of Categorical Variables

Enduring Understanding:
Inference is a tool for validating a claim about a population parameter.

Essential Questions:
- How is a test of significance done?
- How does one distinguish among the various tests of significance?

Unit Goals:
Students will be able to perform a test for goodness of fit using a two-way table.
Students will be able to perform a chi-square test of significance.

Duration of Unit: 1 week
NJCCCS: 4.4 A2; 4.5 A1-5; 4.5 B1-4; 4.5 D1-6

<table>
<thead>
<tr>
<th>Guiding / Topical Questions</th>
<th>Content, Themes, Concepts, and Skills</th>
<th>Instructional Resources and Materials</th>
<th>Teaching Strategies</th>
<th>Assessment Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>What is a chi-square test?</td>
<td>Define what is meant by a chi-square test.</td>
<td>Current textbook and resource binders</td>
<td>Lecture and class discussion</td>
<td>Written tests and quizzes</td>
</tr>
<tr>
<td>How does one conduct a chi-square goodness of fit test?</td>
<td>Define the steps necessary for carry out a chi-square goodness of fit test.</td>
<td>Statistical websites - see attachment</td>
<td>Student investigation activities</td>
<td>Worksheets</td>
</tr>
<tr>
<td>What is a two-way table?</td>
<td>Draw and complete a two-way table.</td>
<td>Magazine articles</td>
<td>Complete the chapter study guides</td>
<td>Project assessments</td>
</tr>
<tr>
<td>What is a chi-square test for homogeneity?</td>
<td>Use a two-way table to find the chi-square value and use it to generate a p value for a test of significance of homogeneity of a population proportion.</td>
<td>Newspapers</td>
<td>Create posters and/or power point presentations</td>
<td>Notebook assessments</td>
</tr>
<tr>
<td>What is a chi-square test for association/independence?</td>
<td>Use a two-way table to find the chi-square value and use it to generate a p value for a test of significance of association/independence for two population variables.</td>
<td>Videos (Against all odds)</td>
<td>Use whiteboards to show immediate feedback.</td>
<td>Responses to discussion questions</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Previous AP Exam questions</td>
<td>Use worksheets to reinforce concepts.</td>
<td>Journal assessments</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Statistical Applets</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Graphing Calculator</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Suggestions on how to differentiate in this unit:
- Teaching methods will be diversified to appeal to visual, auditory and kinesthetic learners
- Students will be given copies of data sets and other important notes
- Students will be assessed by traditional and alternative methods
- Students will work individually, with partners and in small groups on certain activities
Freehold Regional High School District  
Advanced Placement Statistics  

Unit #12: Inference for Regression

**Enduring Understandings:**
- Regression is an instrument used to generalize relationships for bivariate data.
- Inference is a tool for validating a claim about a population parameter.

**Essential Questions:**
- How well does data fit a regression model?
- What are the properties of a linear regression model?
- How is a test of significance done?

**Unit Goals:**
- Students will be able to create a confidence interval for the slope of a regression line.
- Students will be able to test the hypothesis of a linear relationship of the regression line.

**Duration of Unit:** 2 weeks

**NJCCCS:** 4.3 C1, 2; 4.4 A2; 4.4 A4, 5; 4.5 A4, 5; 4.5 B1-4; 4.5 D1-6; 4.5 E2

<table>
<thead>
<tr>
<th>Guiding / Topical Questions</th>
<th>Content, Themes, Concepts, and Skills</th>
<th>Instructional Resources and Materials</th>
<th>Teaching Strategies</th>
<th>Assessment Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>What conditions are necessary to do inference for regression?</td>
<td>Identify and list the conditions necessary for regression analysis.</td>
<td>Current textbook and resource binders</td>
<td>Lecture and class discussion</td>
<td>Written tests and quizzes</td>
</tr>
<tr>
<td>What is meant by the standard error about the least-squares line?</td>
<td>Apply the formulas for calculating standard error.</td>
<td>Statistical websites - see attachment Magazine articles</td>
<td>Student investigation activities Complete the chapter study guides Create posters and/or power point presentations Use whiteboards to show immediate feedback. Use worksheets to reinforce concepts.</td>
<td>Worksheets Project assessments Notebook assessments Responses to discussion questions Journal assessments</td>
</tr>
<tr>
<td>How does one compute a confidence interval for the slope of the least-squares line?</td>
<td>Establish and apply the formula for a confidence interval for the regression slope.</td>
<td>Newspapers Videos (Against all odds)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>How does one conduct a test of significance for the slope of the least-squares line?</td>
<td>Establish and apply the steps for a test of significance for the regression slope.</td>
<td>Previous AP Exam questions Statistical Applets Graphing Calculator</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Suggestions on how to differentiate in this unit:**
- Teaching methods will be diversified to appeal to visual, auditory and kinesthetic learners
- Students will be given copies of data sets and other important notes
- Students will be assessed by traditional and alternative methods
- Students will work individually, with partners and in small groups on certain activities
Freehold Regional High School District
Advanced Placement Statistics

Unit #13: Post Advanced Placement Exam

Enduring Understandings:
Statistics can be applied to many different disciplines and fields.
Technology is instrumental to the study of statistics in an interactive classroom

Essential Question:
How can one apply various statistical techniques to analyze results when working on a novel research project?

Unit Goals:
Students will demonstrate understanding of concepts covered throughout the year via a year end project.
Students will incorporate appropriate technology to augment and facilitate calculations necessary for statistical summaries.

Duration of Unit: 5 weeks
NJCCCS: 4.3 C1, 2; 4.4 A2; 4.4 A4, 5; 4.5 A4, 5; 4.5 B1-4; 4.5 D1-6; 4.5 E2

<table>
<thead>
<tr>
<th>Guiding / Topical Questions</th>
<th>Content, Themes, Concepts, and Skills</th>
<th>Instructional Resources and Materials</th>
<th>Teaching Strategies</th>
<th>Assessment Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>How does one collect and analyze real world data?</td>
<td>Use Scatterplots and apply correlations to analyze collected data</td>
<td>Platinum Resource Binder – Special Problem 3b “What’s Your Best Offer?”</td>
<td>Class discussion</td>
<td>Rubrics</td>
</tr>
<tr>
<td>How does one use probabilities to analyze games of chance?</td>
<td>Use a variety of probabilistic methods to deduce mathematical likelihood of success.</td>
<td>Platinum Resource Binder – “Casino Lab”</td>
<td>Student investigation activities</td>
<td>Project assessments</td>
</tr>
<tr>
<td>How does one test a claim about a population parameter?</td>
<td>Use statistical principles and sample data to validate a claim.</td>
<td>Platinum Resource Binder – Special Problem 11b “The Pineapple Problem”</td>
<td>Create posters and/or power point presentations</td>
<td>Responses to discussion questions</td>
</tr>
<tr>
<td>How does one compare a claim about two population parameters?</td>
<td>Use statistical principles and sample data to validate a claim.</td>
<td>Movie – “A Civil Action” in conjunction with the attached handout listed in addendum.</td>
<td>Use whiteboards to show immediate feedback.</td>
<td>Journal assessments</td>
</tr>
<tr>
<td>How does one test a claim about two population proportions?</td>
<td>Use Chi-Square principles to assess relationships.</td>
<td>Platinum Resource Binder – Special Problem 14a “Do Dogs Resemble Their Owners?”</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Suggestions on how to differentiate in this unit:
- Teaching methods will be diversified to appeal to visual, auditory and kinesthetic learners
- Students will be given copies of data sets and other important notes
- Students will be assessed by traditional and alternative methods
- Students will work individually, with partners and in small groups on certain activities