Glen Ridge Public Schools –Mathematics Curriculum

Course Title: ADVANCED PLACEMENT STATISTICS

Subject: Mathematics

Grade Level: 9-12

Duration: Full Year

Prerequisite: Algebra II and Geometry with a grade of "B+" or better, teacher recommendation and completion of summer assignment.

Elective or Required: Elective

Mathematics Mission Statement

Mathematics is an integral part of our lives. Students must be actively involved in their mathematics education through the use of modeling and demonstrating the ability to persevere through problem solving. The mathematics curricula will emphasize critical thinking skills through a balance of logic and reasoning, attention to precision by utilizing patterns and structure, and bridging these ideas to cross-curricular learning. Students will be engaged and challenged in a student-centered learning environment that is developmentally appropriate and will communicate mathematical ideas, both in a verbal and written form. Through effectively applying hands-on manipulatives, basic computation skills and the use of technical writing to justify their processes, students will critique the work of themselves and others.

Course Description:

AP Statistics is an introductory, non-calculus based course in statistics. The purpose of the course is to introduce and develop strategies for collecting, organizing, analyzing, and drawing conclusions from data. Students are exposed to four broad conceptual themes:

1. Exploring Data: Observing patterns and departures from patterns
2. Planning a Study: Deciding what and how to measure
3. Anticipating Patterns: Producing models using probability and simulation
4. Statistical Inference: Confirming models.

Modern technology provides a mechanism for the simulation and analysis of data. Students will use a TI-83/84 graphing calculator and Web-based java applets to investigate statistical concepts. 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. To develop effective statistical communication skills, students will be required to prepare frequent written and oral analysis of real data. 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.

Textbook: *The Practice of Statistics 5th ed*, Starnes, Tabor & Yates
eBook: Launch Pad (access code distributed in class)
AP Review Book: *Strive for a 5 Guide*

Author: Catherine McCarthy
Date Submitted: Summer 2017

AP STATISTICS

Unit I: Exploring and Understanding Data

Approximate # of weeks: 2.5

Essential Questions:

- What is data and are there different types of data?
- What are the numerical and graphical methods for data representation?
- Which are the best types of graphs to use for different types of data?
- How can technology be helpful in the study of statistics?
- What information does a graph reveal about a distribution of data?
- What are some examples of statistics used in real life?

NJ Student Learning Standards: S-ID # 1,2,3, & 5

Upon completion of this unit students will be able to:

- Identify the individuals and variables in a set of data.
- Classify variables as categorical or quantitative.
- Display categorical data with a bar graph.
- Given a set of data, decide if it would be appropriate to make a pie chart.
- Identify what makes some graphs of categorical data deceptive.
- Calculate and display the marginal distribution of a categorical variable from a two-way table.
- Calculate and display the conditional distribution of a categorical variable for a particular value of the other categorical variable in a two-way table.
- Describe the association between two categorical variables by comparing appropriate conditional distributions.
- Make and interpret dotplots and stemplots of quantitative data.
- Describe the overall pattern (shape, center, and spread) of a distribution and identify any major departures from the pattern (outliers).
- Identify the shape of a distribution from a graph as roughly symmetric or skewed.

- Compare distributions of quantitative data using dotplots or stemplots.
- Make and interpret histograms of quantitative data.
- Compare distributions of quantitative data using histograms.
- Calculate measures of center (mean, median).
- Calculate and interpret measures of spread (range, *IQR, standard deviation*).
- Choose the most appropriate measure of center and spread in a given setting.
- Identify outliers using the 1.5×*IQR* rule.
- Make and interpret boxplots of quantitative data.
- Use appropriate graphs and numerical summaries to compare distributions of quantitative variables.

Interdisciplinary Standards

- Standard 9.1 21st-Century Life & Career Skills
- Standard 8.1 Computer and Information Literacy
- Standard 8.2 Technology Education
- Standard 6.3 Active Citizenship in the 21st Century
- Standard 9.3 Career Awareness, Exploration, and Preparation

Activities:

- Assignments and announcements will be delivered through Google Classroom
- Smartboard Lessons will be used to relay notes to students
- Students will read and study material presented in course textbook and then be challenged with questions about their reading through examples.
- Students will take notes on instructor's lecture and participate in class discussions.
- Students will navigate through the chapter using LaunchPad to access tutorial video clips, step-by-step worked out solutions to selected problems, and on-line practice quizzes.
- Instructor will provide opportunity for both guided and independent practice.
- Homework assignments will be discussed to insure a good understanding of the prerequisites.
- Technology: the graphing calculator will be integrated into various exercises to help the student visualize the problems.
- Students will be asked to make conclusions after working through explorations scattered throughout the unit.
- FRAPPY practice
- Lab activities: Hiring Discrimination (p.5)
  Motivating SOCS (p.26)
  Do you Know your Geography? (p.59)
  The Memory Game (p.59)
- Applets: One Variable Statistical Calculator
  Mean-Median
  Dot Plot Summaries
- Chapter 1 Project: Exploring Data in Real-Life Situations

Enrichment Activities:

- Students may access tutorial videos keyed to the student text through either e-book or on the textbook's website: www.whfreeman.com/tps5e
- Students may access worked out examples, exercises and detailed key-stroke-level instructional videos through either e-book or on the textbook's website: www.whfreeman.com/tps5e
- Review book *Strive for a 5:* Chapter 1
- Students may access practice Free-Response questions on the College Board website: apcentral.collegeboard.com/stats
- Video Unit 1: What Is Statistics? (6:23) http://www.learner.org/courses/againstallodds/unitpages/unit01.html
- Video Unit 2: Stemplots (11:49) http://www.learner.org/courses/againstallodds/unitpages/unit02.html
- Video Unit 3: Histograms (9:41) http://www.learner.org/courses/againstallodds/unitpages/unit03.html
- Video Unit 4: Measures of Center (8:50) http://www.learner.org/courses/againstallodds/unitpages/unit04.html
- Video Unit 6: Standard Deviation (9:07) http://www.learner.org/courses/againstallodds/unitpages/unit06.html
- Video Unit 5: Boxplots (9:06) http://www.learner.org/courses/againstallodds/unitpages/unit05.html

Methods of Assessments/Evaluation:

- Written quizzes and unit test
- Worksheets
- Responses to discussion questions
- Homework
- Classwork
- Verbal Assessment
- Think/Pair/Share
- Exit slips
- Self- Assessment exercises as found on textbook websites
- Independent extra credit assignments
- Observations
- Peer Editing-Grading

Resources/Including Online Resources

- Textbook website: www.whfreeman.com/tps5e
- Google Classroom
- LaunchPad
- Teacher Webpage
- Statistical Websites as referenced in textbook
- Teacher's Resource Flashdrive
- Magazine and Newspaper articles

- Statistical Applets as referenced in textbook
- Graphing Calculator
- AP Central College Board website and list-serve
- Annenberg-Learner Video Series: Against All Odds

Learning Goal Scale:

4 The student will analyze and design appropriate graphical and descriptive summaries for a given set of data
3 The student will compare and contrast distributions of data
2 The student will interpret a distribution of data for its center, shape, spread and outliers or gaps
1 The student will read a graphical display for its important characteristics

Unit II: Describing Location within a Distribution

Approximate # Of Weeks: 2

Essential Questions:

- What is a density curve?
- How can density curves be used to express relative standing?
- What is a normal distribution?
- What does a normal distribution imply about the spread of data?
- How does one assess normality?

NJ Student Learning Standards: S-ID # 4

Upon completion of this unit students will be able to:

- Find and interpret the percentile of an individual value within a distribution of data.
- Estimate percentiles and individual values using a cumulative relative frequency graph.
- Find and interpret the standardized score (z-score) of an individual value within a distribution of data.
- Describe the effect of adding, subtracting, multiplying by, or dividing by a constant on the shape, center, and spread of a distribution of data.
- Estimate the relative locations of the median and mean on a density curve.
- Use the 68–95–99.7 rule to estimate areas (proportions of values) in a Normal distribution.
- Use Table A or technology to find (i) the proportion of z-values in a specified interval, or (ii) a z-score from a percentile in the standard Normal distribution.
- Use Table A or technology to find (i) the proportion of values in a specified interval, or (ii) the value that corresponds to a given percentile in any Normal distribution.

- Determine if a distribution of data is approximately Normal from graphical and numerical evidence.

Interdisciplinary Standards

- Standard 9.1 21st-Century Life & Career Skills
- Standard 8.1 Computer and Information Literacy
- Standard 8.2 Technology Education
- Standard 6.3 Active Citizenship in the 21st Century

Activities:

- Assignments and announcements will be delivered through Google Classroom
- Smartboard Lessons will be used to relay notes to students
- Students will read and study material presented in course textbook and then be challenged with questions about their reading through examples.
- Students will take notes on instructor's lecture and participate in class discussions.
- Students will navigate through the chapter using LaunchPad to access tutorial video clips, step-by-step worked out solutions to selected problems, and on-line practice quizzes.
- Instructor will provide opportunity for both guided and independent practice.
- Homework assignments will be discussed to insure a good understanding of the prerequisites.
- Technology: the graphing calculator will be integrated into various exercises to help the student visualize the problems.
- Students will be asked to make conclusions after working through explorations scattered throughout the unit.
- FRAPPY practice
- AP Multiple Choice and Free Response questions
- Special Problem**:** Exploring Normal Distributions
- Data Exploration: The Vending Machine Problem
- Technology: Normal Curve Applet; Normal Probability Plots on the Calculator

Enrichment Activities:

- Students may access tutorial videos keyed to the student text through either e-book or on the textbook's website: www.whfreeman.com/tps5e
- Students may access worked out examples, exercises and detailed key-stroke-level instructional videos through either e-book or on the textbook's website: www.whfreeman.com/tps5e
- Review book *Strive for a 5:* Chapter 3
- Students may access practice Free-Response questions on the College Board website: apcentral.collegeboard.com/stats
- Video Unit 7: Normal Curves (12:08) [Use after Lesson 5.6] (http://www.learner.org/courses/againstallodds/unitpages/unit07.html)
- Video Unit 8: Normal Calculations (12:49) [Use with Lesson 5.6] (http://www.learner.org/courses/againstallodds/unitpages/unit08.html

- Video Unit 9: Checking the assumption of Normality
  http://www.learner.org/courses/againstallodds/unitpages/unit09.html

Methods of Assessments/Evaluation:

- Written quizzes and unit test
- Worksheets
- Responses to discussion questions
- Homework
- Classwork
- Verbal Assessment
- Think/Pair/Share
- Exit slips
- Self- Assessment exercises as found on textbook website
- Independent extra credit assignments
- Observations
- Peer Editing-Grading

Resources/Including Online Resources

- Textbook website: www.whfreeman.com/tps5e
- Google Classroom
- LaunchPad
- Teacher Webpage
- Statistical Websites as referenced in textbook
- Teacher's Resource Flashdrive
- Statistical Applets as referenced in textbook
- Graphing Calculator
- AP Central College Board website and list-serve
- Annenberg-Learner Video Series: Against All Odds

Learning Goal Scale:

4 The student will analyze a data set for its Normal characteristics and apply the Normal Model to solve real world problems
3 The student will interpret the Empirical Rule and use it to compare data values
2 The student will use z- scores and percentiles to make decisions
1 The student will calculate percentiles and z-scores

Unit III: DATA COLLECTION

Approximate # Of Weeks: 3.5

Essential Questions:

- How do we collect data?
- How do we avoid bias?

- How can causation be established?
- What are the parts of a well-designed experiment?
- What cautions about experimentation exist?

NJ Student Learning Standards: S-IC #1, 3, 6

Upon completion of this unit students will be able to:

- Identify the population and sample in a statistical study.
- Identify voluntary response samples and convenience samples and explain how these sampling methods can lead to bias.
- Describe how to obtain a random sample using slips of paper, technology, or a table of random digits.
- Distinguish a simple random sample from a stratified random sample or cluster sample.
- Give the advantages and disadvantages of each type of sampling method.
- Explain how undercoverage, nonresponse, question wording, and other aspects of a sample survey can lead to bias.
- Distinguish between an observational study and an experiment.
- Explain the concept of confounding and how it limits the ability to make cause-and-effect conclusions.
- Identify the experimental units, explanatory and response variables, and treatments.
- Explain the purpose of comparison, random assignment, control, and replication in an experiment.
- Describe a completely randomized design for an experiment, including how to randomly assign treatments using slips of paper, technology, or a table of random digits.
- Describe the placebo effect and the purpose of blinding in an experiment.
- Interpret the meaning of statistically significant in the context of an experiment.
- Explain the purpose of blocking in an experiment.
- Describe a randomized block design or a matched pairs design for an experiment.
- Describe the scope of inference that is appropriate in a statistical study.
- Evaluate whether a statistical study has been carried out in an ethical manner.

Interdisciplinary Standards

- Standard 9.1 21st-Century Life & Career Skills
- Standard 8.1 Computer and Information Literacy
- Standard 8.2 Technology Education
- Standard 6.3 Active Citizenship in the 21st Century
- Standard 5.1 Science Practices A & B

Activities:

- Assignments and announcements will be delivered through Google Classroom
- Smartboard Lessons will be used to relay notes to students

- Students will read and study material presented in course textbook and then be challenged with questions about their reading through examples.
- Students will take notes on instructor's lecture and participate in class discussions.
- Students will navigate through the chapter using LaunchPad to access tutorial video clips, step-by-step worked out solutions to selected problems, and on-line practice quizzes.
- Instructor will provide opportunity for both guided and independent practice.
- Homework assignments will be discussed to insure a good understanding of the prerequisites.
- Technology: the graphing calculator will be integrated into various exercises to help the student visualize the problems.
- Students will be asked to make conclusions after working through explorations scattered throughout the unit.
- FRAPPY practice
- AP Multiple Choice and Free Response questions
- Lab activities: See No Evil, Hear No Evil
  Who Wrote the Federalist Papers
  Random Rectangles
  Sampling Sunflowers
  Distracted Driving
- Project: Response Bias

Enrichment Activities:

- Students may access tutorial videos keyed to the student text through either e-book or on the textbook's website: www.whfreeman.com/tps5e
- Students may access worked out examples, exercises and detailed key-stroke-level instructional videos through either e-book or on the textbook's website: www.whfreeman.com/tps5e
- Review book *Strive for a 5:* Chapter 4
- Students may access practice Free-Response questions on the College Board website: apcentral.collegeboard.com/stats
- Video Unit 16: Census and Sampling (9:44) [Use after Lesson 3.2] (http://www.learner.org/courses/againstallodds/unitpages/unit02.html)
- Video Unit 17: Samples and Surveys (10:05) [Use after Lesson 3.4] (http://www.learner.org/courses/againstallodds/unitpages/unit17.html)
- Video Unit 14: The Question of Causation (14:05) [Use after Lesson 3.5] (http://www.learner.org/courses/againstallodds/unitpages/unit03.html)
- Video Unit 15: Designing Experiments (11:11) [Use after Lesson 3.6] (http://www.learner.org/courses/againstallodds/unitpages/unit15.html

Methods of Assessments/Evaluation:

- Written quizzes and unit test
- Worksheets
- Responses to discussion questions
- Homework

- Classwork
- Verbal Assessment
- Think/Pair/Share
- Exit slips
- Self- Assessment exercises as found on textbook websites
- Independent extra credit assignments
- Observations
- Peer Editing-Grading

Resources/Including Online Resources

- Textbook website: www.whfreeman.com/tps5e
- Google Classroom
- LaunchPad
- Teacher Webpage
- Statistical Websites as referenced in textbook
- Teacher's Resource Flashdrive
- Statistical Applets as referenced in textbook
- Graphing Calculator
- AP Central College Board website and list-serve
- Annenberg-Learner Video Series: Against All Odds

Learning Goal Scale:

4 The student will design an appropriate study to answer a given research question
3 The student will compare different sampling and/or experimental design techniques
2 The student will collect and appropriately display data for a given real world problem
1 The student will recognize the different methods of gathering data

Unit IV: RANDOMNESS AND PROBABILITY

Approximate # Of Weeks: 2.5

Essential Questions:

- What is Randomness?
- What is a Probability Model and how does it affect our world?
- What is a Probability Distribution?
- How can we compute and express probabilities in simple and complex situations?
- How can simulations be used to model probability?
- What is demonstrated by the Law of Large Numbers?

NJ Student Learning Standards: S-ID # 1, 2, S-CP # 1-9

Upon completion of this unit students will be able to:

- Interpret probability as a long-run relative frequency.
- Use simulation to model chance behavior.
- Determine a probability model for a chance process.
- Use basic probability rules, including the complement rule and the addition rule for mutually exclusive events.
- Use a two-way table or Venn diagram to model a chance process and calculate probabilities involving two events.
- Use the general addition rule to calculate probabilities.
- Calculate and interpret conditional probabilities.
- Use the general multiplication rule to calculate probabilities.
- Use tree diagrams to model a chance process and calculate probabilities involving two or more events.
- Determine whether two events are independent.
- When appropriate, use the multiplication rule for independent events to compute probabilities.

Interdisciplinary Standards

- Standard 9.1 21st-Century Life & Career Skills
- Standard 8.1 Computer and Information Literacy
- Standard 8.2 Technology Education
- Standard 6.3 Active Citizenship in the 21st Century

Activities:

- Assignments and announcements will be delivered through Google Classroom
- Smartboard Lessons will be used to relay notes to students
- Students will read and study material presented in course textbook and then be challenged with questions about their reading through examples.
- Students will take notes on instructor's lecture and participate in class discussions.
- Students will navigate through the chapter using LaunchPad to access tutorial video clips, step-by-step worked out solutions to selected problems, and on-line practice quizzes.
- Instructor will provide opportunity for both guided and independent practice.
- Homework assignments will be discussed to insure a good understanding of the prerequisites.
- Technology: the graphing calculator will be integrated into various exercises to help the student visualize the problems.
- Students will be asked to make conclusions after working through explorations scattered throughout the unit.
- FRAPPY practice
- AP Multiple Choice and Free Response questions
- Simulation Activity: Airline Overbooking Part I
- Lab activities: Monty Hall Problem
  "1 in 6 Wins" Game
  Whose Book is This?
- Data Exploration: Investigating Randomness

Enrichment Activities:

- Students may access tutorial videos keyed to the student text through either e-book or on the textbook's website: www.whfreeman.com/tps5e
- Students may access worked out examples, exercises and detailed key-stroke-level instructional videos through either e-book or on the textbook's website: www.whfreeman.com/tps5e
- Review book *Strive for a 5:* Chapter 5
- Students may access practice Free-Response questions on the College Board website: apcentral.collegeboard.com/stats
- Video Unit 18: Introduction to Probability (11:20) [Use after Lesson 4.1] (http://www.learner.org/courses/againstallodds/unitpages/unit18.html)
- Video Unit 19: Probability Models (10:33) [Use after Lesson 4.6] (http://www.learner.org/courses/againstallodds/unitpages/unit19.html

Methods of Assessments/Evaluation:

- Written quizzes and unit test
- Worksheets
- Responses to discussion questions
- Homework
- Classwork
- Verbal Assessment
- Think/Pair/Share
- Exit slips
- Self- Assessment exercises as found on textbook websites
- Independent extra credit assignments
- Observations
- Peer Editing-Grading

Resources/Including Online Resources

- Textbook website: www.whfreeman.com/tps5e
- Google Classroom
- LaunchPad
- Teacher Webpage
- Statistical Websites as referenced in textbook
- Teacher's Resource Flashdrive
- Statistical Applets as referenced in textbook
- Graphing Calculator
- AP Central College Board website and list-serve
- Annenberg-Learner Video Series: Against All Odds

Learning Goal Scale:

4 The student will analyze and solve real world problems with the appropriate probability strategies

3 The student will differentiate the basic definitions and rules of probability including the Complement Rule, the Addition Rule, the Multiplication Rule
2 The student will solve and interpret routine probability problems
1 The student will recognize the appropriate calculation of the number of ways an event may occur and use it to compute probabilities

Unit V: Random Variables and Discrete Probability Distributions

Approximate # Of Weeks: 2.5

Essential Questions:

- What is a Random Variable?
- What is a Probability Distribution for a Random Variable?
- How do we combine Independent Random Variables?
- How does one identify a Binomial or Geometric Variable?
- How are Binomial or Geometric Probability models used?

NJ Student Learning Standards: S-MD # 1-4, 5Aa, 5b

Upon completion of this unit students will be able to:

- Compute probabilities using the probability distribution of a discrete random variable.
- Calculate and interpret the mean (expected value) of a discrete random variable.
- Calculate and interpret the standard deviation of a discrete random variable.
- Compute probabilities using the probability distribution of a continuous random variable.
- Describe the effects of transforming a random variable by adding or subtracting a constant and multiplying or dividing by a constant.
- Find the mean and standard deviation of the sum or difference of independent random variables.
- Find probabilities involving the sum or difference of independent Normal random variables.
- Determine whether the conditions for using a binomial random variable are met.
- Compute and interpret probabilities involving binomial distributions.
- Calculate the mean and standard deviation of a binomial random variable and interpret these values in context.
- Find probabilities involving geometric random variables.

Interdisciplinary Standards

- Standard 9.1 21st-Century Life & Career Skills
- Standard 8.1 Computer and Information Literacy
- Standard 8.2 Technology Education
- Standard 6.3 Active Citizenship in the 21st Century

Activities:

- Assignments and announcements will be delivered through Google Classroom
- Smartboard Lessons will be used to relay notes to students
- Students will read and study material presented in course textbook and then be challenged with questions about their reading through examples.
- Students will take notes on instructor's lecture and participate in class discussions.
- Students will navigate through the chapter using LaunchPad to access tutorial video clips, step-by-step worked out solutions to selected problems, and on-line practice quizzes.
- Instructor will provide opportunity for both guided and independent practice.
- Homework assignments will be discussed to insure a good understanding of the prerequisites.
- Technology: the graphing calculator will be integrated into various exercises to help the student visualize the problems.
- Students will be asked to make conclusions after working through explorations scattered throughout the unit.
- FRAPPY practice
- AP Multiple Choice and Free Response questions
- Lab Activity: Airline Overbooking Part II
  Is This Your Luck Day?

Enrichment Activities:

- Students may access tutorial videos keyed to the student text through either e-book or on the textbook's website: www.whfreeman.com/tps5e
- Students may access worked out examples, exercises and detailed key-stroke-level instructional videos through either e-book or on the textbook's website: www.whfreeman.com/tps5
- Review book *Strive for a 5:* Chapter 6
- Students may access practice Free-Response questions on the College Board website: apcentral.collegeboard.com/stats
- Video Unit 20: Random Variables (11:09) [Use after Lesson 5.2] (http://www.learner.org/courses/againstallodds/unitpages/unit20.html)
- Video Unit 21: Binomial Distributions (11:28) [Use after Lesson 5.3] (http://www.learner.org/courses/againstallodds/unitpages/unit21.html)

Methods of Assessments/Evaluation:

- Written quizzes and unit test
- Worksheets
- Responses to discussion questions
- Homework
- Classwork
- Verbal Assessment
- Think/Pair/Share
- Exit slips
- Self- Assessment exercises as found on textbook websites
- Independent extra credit assignments

- Observations
- Peer Editing-Grading

Resources/Including Online Resources

- Textbook website: www.whfreeman.com/tps5e
- Google Classroom
- LaunchPad
- Teacher Webpage
- Statistical Websites as referenced in textbook
- Teacher's Resource Flashdrive
- Statistical Applets as referenced in textbook
- Graphing Calculator
- AP Central College Board website and list-serve
- Annenberg-Learner Video Series: Against All Odds

Learning Goal Scale:

4 The student will analyze real world situations so as to interpret the mean and standard deviation of random variables

3 The student will use the appropriate Binomial or Geometric model to find probabilities

2 The student will calculate the expected value (mean) and standard deviation for the distribution of random variables

1 The student will specify the probability model for the distribution of a discrete random variable

Unit VI: Sampling Distributions

Approximate # Of Weeks: 2.5

Essential Questions:

- How do Statistics Vary?
- What is a Sampling Distribution?
- How does sample size effect the distribution of means?
- What is the impact of the Central Limit Theorem?
- How does one model the distribution of sample proportions?

NJ Student Learning Standards: S-IC #1, 3, 4

Upon completion of this unit students will be able to:

- Identify parameters and statistics in a sample or experiment.
- Develop and understand the characteristics of sampling variability of the distribution of sample proportions.
- Interpret a sampling distribution as describing the values taken by a statistic in all possible repetitions of a sample of experiment under the same conditions.

- Describe the bias and variability of a statistic in terms of the mean and spread of its sampling distribution.
- Recognize when a problem involves a sample proportion.
- Determine the mean and standard deviation of the sampling distribution of sample proportions.
- Develop and understand the characteristics of the variability of the sampling distribution of sample proportions.
- Recognize when it is possible to use the Normal approximation to the sampling distribution of sample proportions.
- Use Normal approximations to calculate the probabilities of sample proportions.
- Recognize when a problem involves the mean of a sample.
- Determine the mean and standard deviation of the sampling distribution of sample means.
- Develop and understand the characteristics of sampling variability of the distribution of sample means.
- Develop, understand, and apply the Central Limit Theorem.

Interdisciplinary Standards

- Standard 9.1 21st-Century Life & Career Skills
- Standard 8.1 Computer and Information Literacy
- Standard 8.2 Technology Education
- Standard 6.3 Active Citizenship in the 21st Century

Activities:

- Assignments and announcements will be delivered through Google Classroom
- Smartboard Lessons will be used to relay notes to students
- Students will read and study material presented in course textbook and then be challenged with questions about their reading through examples.
- Students will take notes on instructor's lecture and participate in class discussions.
- Students will navigate through the chapter using LaunchPad to access tutorial video clips, step-by-step worked out solutions to selected problems, and on-line practice quizzes.
- Instructor will provide opportunity for both guided and independent practice.
- Homework assignments will be discussed to insure a good understanding of the prerequisites.
- Technology: the graphing calculator will be integrated into various exercises to help the student visualize the problems.
- Students will be asked to make conclusions after working through explorations scattered throughout the unit.
- FRAPPY practice
- AP Multiple Choice and Free Response questions
- Lab Activities Lab activities: GETTYSBURGH ADDRESS
  Reaching for Chips
  Sampling Heights
  Candy Machine

- Statistical Applet: Reese's Pieces
- Data Exploration: Polls (Sampling Proportions)

Enrichment Activities:

- Students may access tutorial videos keyed to the student text through either e-book or on the textbook's website: www.whfreeman.com/tps5e
- Students may access worked out examples, exercises and detailed key-stroke-level instructional videos through either e-book or on the textbook's website: www.whfreeman.com/tps5e
- Review book *Strive for a 5:* Chapter 7
- Students may access practice Free-Response questions on the College Board website: apcentral.collegeboard.com/stats
- Video # 22: Sampling Distributions http://www.learner.org/courses/againstallodds/unitpages/unit22.html

Methods of Assessments/Evaluation:

- Written quizzes and unit test
- Worksheets
- Responses to discussion questions
- Homework
- Classwork
- Verbal Assessment
- Think/Pair/Share
- Exit slips
- Self- Assessment exercises as found on textbook websites
- Independent extra credit assignments
- Observations
- Peer Editing-Grading

Resources/Including Online Resources

- Textbook website: www.whfreeman.com/tps5e
- Google Classroom
- LaunchPad
- Teacher Webpage
- Statistical Websites as referenced in textbook
- Teacher's Resource Flashdrive
- Statistical Applets as referenced in textbook
- Graphing Calculator
- AP Central College Board website and list-serve
- Annenberg-Learner Video Series: Against All Odds

Learning Goal Scales:

4 The student will analyze a data distribution and apply the appropriate sampling model to solve real world problems

3 The student will use appropriate sampling model to describe the variability of a sampling distribution

2 The student will calculate the mean and standard deviation of a sampling distribution

1 The student will distinguish between the sampling distribution of proportions or means

Unit VII: Estimating with Confidence

Approximate # Of Weeks: 3

Essential Questions:

- What does it mean to make an inference?
- How do we use statistics to estimate parameters?
- What is a margin of error?
- What is a confidence interval?
- How does one distinguish among the various confidence intervals?

NJ Student Learning Standards: S-IC # 1, 2, 4, 5,

Upon completion of this unit students will be able to:

- Interpret a confidence interval in context.
- Interpret a confidence level in context.
- Determine the point estimate and margin of error from a confidence interval.
- Describe how the sample size and confidence level affect the length of a confidence interval.
- Explain how practical issues like nonresponse, undercoverage, and response bias can affect the interpretation of a confidence interval.
- State and check the Random, 10%, and Large Counts conditions for constructing a confidence interval for a population proportion.
- Determine critical values for calculating a C% confidence interval for a population proportion using a table or technology.
- Construct and interpret a confidence interval for a population proportion.
- Determine the sample size required to obtain a C% confidence interval for a population proportion with a specified margin of error.
- Explain how the t distributions are different from the standard Normal distribution and why it is necessary to use a t distribution when calculating a confidence interval for a population mean.
- Determine critical values for calculating a C% confidence interval for a population mean using a table or technology.
- State and check the Random, 10%, and Normal/Large Sample conditions for constructing a confidence interval for a population mean.
- Construct and interpret a confidence interval for a population mean.
- Determine the sample size required to obtain a C% confidence interval for a population mean with a specified margin of error.

Interdisciplinary Standards

- Standard 9.1 21st-Century Life & Career Skills
- Standard 8.1 Computer and Information Literacy
- Standard 8.2 Technology Education
- Standard 6.3 Active Citizenship in the 21st Century
- Standard 5.1 Science Practices

Activities – include 21st Century Technologies:

- Assignments and announcements will be delivered through Google Classroom
- Smartboard Lessons will be used to relay notes to students
- Students will read and study material presented in course textbook and then be challenged with questions about their reading through examples.
- Students will take notes on instructor's lecture and participate in class discussions.
- Students will navigate through the chapter using LaunchPad to access tutorial video clips, step-by-step worked out solutions to selected problems, and on-line practice quizzes.
- Instructor will provide opportunity for both guided and independent practice.
- Homework assignments will be discussed to insure a good understanding of the prerequisites.
- Technology: the graphing calculator will be integrated into various exercises to help the student visualize the problems.
- Students will be asked to make conclusions after working through explorations scattered throughout the unit.
- FRAPPY practice
- AP Multiple Choice and Free Response questions
- Lab Activity: Calculator Bingo
  Mystery Mean
- Applet: Confidence Intervals for Proportions

Enrichment Activities:

- Students may access tutorial videos keyed to the student text through either e-book or on the textbook's website: www.whfreeman.com/tps5e
- Students may access worked out examples, exercises and detailed key-stroke-level instructional videos through either e-book or on the textbook's website: www.whfreeman.com/tps5e
- Review book *Strive for a 5:* Chapter 8
- Students may access practice Free-Response questions on the College Board website: apcentral.collegeboard.com/stats
- Video Unit 28: Inference for Proportions (http://www.learner.org/courses/againstallodds/unitpages/unit02.html)
- Video Unit 26: Small Sample Inference for One Mean (http://www.learner.org/courses/againstallodds/unitpages/unit02.html)
- Video Unit 24: Confidence Intervals (10:02) (http://www.learner.org/courses/againstallodds/unitpages/unit24.html)

Methods of Assessments/Evaluation:

- Written quizzes and unit test
- Worksheets
- Responses to discussion questions
- Homework
- Classwork
- Verbal Assessment
- Think/Pair/Share
- Exit slips
- Self- Assessment exercises as found on textbook websites
- Independent extra credit assignments
- Observations
- Peer Editing-Grading

Resources/Including Online Resources

- Textbook website: www.whfreeman.com/tps5e
- Google Classroom
- LaunchPad
- Teacher Webpage
- Statistical Websites as referenced in textbook
- Teacher's Resource Flashdrive
- Statistical Applets as referenced in textbook
- Graphing Calculator
- AP Central College Board website and list-serve
- Annenberg-Learner Video Series: Against All Odds

Learning Goal Scale:

4 The student will analyze a real world problem so as to appropriately use a t distribution or a Normal distribution to calculate and interpret a confidence interval for a population mean or proportion

3 The student will explain the difference between t and Normal distributions

2 The student will calculate the margin of error for a confidence interval

1 The student will use a calculator to find appropriate confidence interval

Unit VIII: Significance Testing for One Population

Approximate # Of Weeks: 3

Essential Questions:

- How do we draw conclusions from samples?
- How do we assess the strength of a claim based on a sample?
- What is a test of significance?
- What is the process for running a test of significance?
- How does one distinguish among the various tests of significance?

NJ Student Learning Standards: S-IC # 1, 2, 5, 6 & S-MD # 5a, 5b, 6, 7

Upon completion of this unit students will be able to:

- State the null and alternative hypotheses for a significance test about a population parameter.
- Interpret a P-value in context.
- Determine if the results of a study are statistically significant and draw an appropriate conclusion using a significance level.
- Interpret a Type I and a Type II error in context, and give a consequence of each.
- State and check the Random, 10%, and Large Counts conditions for performing a significance test about a population proportion.
- Perform a significance test about a population proportion.
- Use a confidence interval to draw a conclusion for a two-sided test about a population parameter.
- Interpret the power of a test and describe what factors affect the power of a test.
- Describe the relationship among the probability of a Type I error (significance level), the probability of a Type II error, and the power of a test.
- State and check the Random, 10%, and Normal/Large Sample conditions for performing a significance test about a population mean.
- Perform a significance test about a population mean.
- Use a confidence interval to draw a conclusion for a two-sided test about a population parameter.
- Perform a significance test about a mean difference using paired data.

Interdisciplinary Standards

- Standard 9.1 21st-Century Life & Career Skills
- Standard 8.1 Computer and Information Literacy
- Standard 8.2 Technology Education
- Standard 6.3 Active Citizenship in the 21st Century
- Standard 5.1 Science Practices A & B

Activities:

- Assignments and announcements will be delivered through Google Classroom
- Smartboard Lessons will be used to relay notes to students
- Students will read and study material presented in course textbook and then be challenged with questions about their reading through examples.
- Students will take notes on instructor's lecture and participate in class discussions.
- Students will navigate through the chapter using LaunchPad to access tutorial video clips, step-by-step worked out solutions to selected problems, and on-line practice quizzes.
- Instructor will provide opportunity for both guided and independent practice.
- Homework assignments will be discussed to insure a good understanding of the prerequisites.

- Technology: the graphing calculator will be integrated into various exercises to help the student visualize the problems.
- Students will be asked to make conclusions after working through explorations scattered throughout the unit.
- FRAPPY practice
- AP Multiple Choice and Free Response questions
- Lab activities: Pick A Card
- Technology: Statistical Applet: Test of Significance Power Applet

Enrichment Activities

- Students may access tutorial videos keyed to the student text through either e-book or on the textbook's website: www.whfreeman.com/tps5e
- Students may access worked out examples, exercises and detailed key-stroke-level instructional videos through either e-book or on the textbook's website: www.whfreeman.com/tps5e
- Review book *Strive for a 5:* Chapter 9
- Students may access practice Free-Response questions on the College Board website: apcentral.collegeboard.com/stats
- Video Unit 26: Small Sample Inference for One Mean (http://www.learner.org/courses/againstallodds/unitpages/unit02.html)
- Video Unit 25: Test of Significance (http://www.learner.org/courses/againstallodds/unitpages/unit25.html
- Video Unit 28: Inference for Proportions (http://www.learner.org/courses/againstallodds/unitpages/unit02.html)

Methods of Assessments/Evaluation:

- Written quizzes and unit test
- Worksheets
- Responses to discussion questions
- Homework
- Classwork
- Verbal Assessment
- Think/Pair/Share
- Exit slips
- Self- Assessment exercises as found on textbook websites
- Independent extra credit assignments
- Observations
- Peer Editing-Grading

Resources/Including Online Resources

- Textbook website: www.whfreeman.com/tps5e
- Google Classroom
- LaunchPad
- Teacher Webpage
- Statistical Websites as referenced in textbook

- Teacher's Resource Flashdrive
- Statistical Applets as referenced in textbook
- Graphing Calculator
- AP Central College Board website and list-serve
- Annenberg-Learner Video Series: Against All Odds

Learning Goal Scale:

4 The student will analyze the results of a study to determine if they are statistically significant and draw an appropriate conclusion using a reasonable significance level

3 The student will determine and understand the relationship among the probability of a Type I error (significance level), the probability of a Type II error, and the power of a test

2 The student will interpret the "p" value of a test

1 The student will state the null and alternative hypothesis for a significance test

Unit IX: Comparing Two Population Parameters

Approximate # Of Weeks: 2

Essential Questions:

- How and why do we test statistics?
- How do we distinguish between 2 sample inference and matched-pair inference?
- How does one construct a confidence interval for two population proportions or means?
- How does one execute a test of significance for two population proportions or means?

NJ Student Learning Standards: S-IC # 1, 2, 5, 6 & S-MD # 5a, 5b, 6, 7

Upon completion of this unit students will be able to:

- Determine whether a problem requires inference about comparing means or proportions.
- Recognize from the design of a study whether one-sample t, paired t, or two-sample t procedures are needed.
- Calculate and interpret a confidence interval for the difference between two means.
- Test the hypothesis that two populations have equal means against either a one-sided or a two-sided alternative.
- Recognize when the two-sample t-procedures are appropriate in practice.
- Use the two-sample z procedure to give a confidence interval for the difference between the two proportions in two populations based on independent SRS from the populations.
- Use a two-proportion z-test to test the hypothesis that the proportions in two distinct populations are equal.
- State and understand the assumptions and/or conditions for the appropriate hypothesis test.

Interdisciplinary Standards

- Standard 9.1 21st-Century Life & Career Skills
- Standard 8.1 Computer and Information Literacy
- Standard 8.2 Technology Education
- Standard 6.3 Active Citizenship in the 21st Century
- Standard 5.1 Science Practices A & B

Activities:

- Assignments and announcements will be delivered through Google Classroom
- Smartboard Lessons will be used to relay notes to students
- Students will read and study material presented in course textbook and then be challenged with questions about their reading through examples.
- Students will take notes on instructor's lecture and participate in class discussions.
- Students will navigate through the chapter using LaunchPad to access tutorial video clips, step-by-step worked out solutions to selected problems, and on-line practice quizzes.
- Instructor will provide opportunity for both guided and independent practice.
- Homework assignments will be discussed to insure a good understanding of the prerequisites.
- Technology: the graphing calculator will be integrated into various exercises to help the student visualize the problems.
- Students will be asked to make conclusions after working through explorations scattered throughout the unit.
- FRAPPY practice
- AP Multiple Choice and Free Response questions
- Lab activities: Is Yawning Contagious?
  Exercising to Lose Weight

Enrichment Activities:

- Students may access tutorial videos keyed to the student text through either e-book or on the textbook's website: www.whfreeman.com/tps5e
- Students may access worked out examples, exercises and detailed key-stroke-level instructional videos through either e-book or on the textbook's website: www.whfreeman.com/tps5e
- Review book *Strive for a 5:* Chapter 10
- Students may access practice Free-Response questions on the College Board website: apcentral.collegeboard.com/stats
- Video Unit 27: Comparing Two Means
  http://www.learner.org/courses/againstallodds/unitpages/unit27.html

Methods of Assessments/Evaluation:

- Written quizzes and unit test
- Worksheets
- Responses to discussion questions
- Homework
- Classwork

- Verbal Assessment
- Think/Pair/Share
- Exit slips
- Self- Assessment exercises as found on textbook websites
- Independent extra credit assignments
- Observations
- Peer Editing-Grading

Resources/Including Online Resources

- Textbook website: www.whfreeman.com/tps5e
- Google Classroom
- LaunchPad
- Teacher Webpage
- Statistical Websites as referenced in textbook
- Teacher's Resource Flashdrive
- Statistical Applets as referenced in textbook
- Graphing Calculator
- AP Central College Board website and list-serve
- Annenberg-Learner Video Series: Against All Odds

Learning Goal Scale:

4 The student will analyze a real world situation for the design of the study and determine whether one-sample t, paired t, or two-sample t procedures are required

3 The student will use two sample inference procedures to construct a confidence interval or conduct a significance test for population mean or proportion

2 The student will interpret the results of a two sample test for means or proportions

1 The student will state the assumptions and conditions for two sample inference procedures

Unit X: Inference for Distributions of Categorical Variables

Approximate # of Weeks: 2

Essential Questions:

- What is a two-way table?
- When are two categorical variables independent?
- How does one distinguish between various types of hypothesis testing?
- How does one conduct a Chi-Square Goodness of Fit test?
- How does one conduct a Chi-Square test for Homogeneity or Association?

NJ Student Learning Standards: S-ID # 5, S-IC # 1, 2, 4, 5, 6, & S-MD # ,7

Upon completion of this unit the student will be able to:

- State appropriate hypotheses and compute expected counts for a chi-square test for goodness of fit.

- Calculate the chi-square statistic, degrees of freedom, and P-value for a chi-square test for goodness of fit.
- Perform a chi-square test for goodness of fit.
- Conduct a follow-up analysis when the results of a chi-square test are statistically significant.
- Compare conditional distributions for data in a two-way table.
- State appropriate hypotheses and compute expected counts for a chi-square test based on data in a two-way table.
- Calculate the chi-square statistic, degrees of freedom, and P-value for a chi-square test based on data in a two-way table.
- Perform a chi-square test for homogeneity.
- Perform a chi-square test for independence.
- Choose the appropriate chi-square test.

Interdisciplinary Standards

- Standard 9.1 21st-Century Life & Career Skills
- Standard 8.1 Computer and Information Literacy
- Standard 8.2 Technology Education
- Standard 6.3 Active Citizenship in the 21st Century
- Standard 5.1 Science Practices A & B

Activities:

- Assignments and announcements will be delivered through Google Classroom
- Smartboard Lessons will be used to relay notes to students
- Students will read and study material presented in course textbook and then be challenged with questions about their reading through examples.
- Students will take notes on instructor's lecture and participate in class discussions.
- Students will navigate through the chapter using LaunchPad to access tutorial video clips, step-by-step worked out solutions to selected problems, and on-line practice quizzes.
- Instructor will provide opportunity for both guided and independent practice.
- Homework assignments will be discussed to insure a good understanding of the prerequisites.
- Technology: the graphing calculator will be integrated into various exercises to help the student visualize the problems.
- Students will be asked to make conclusions after working through explorations scattered throughout the unit.
- FRAPPY practice
- AP Multiple Choice and Free Response questions
- Lab activities: The Candy Man Can!
- Internet Activities: NSDL Classifying Statistical Problems

Enrichment Activities:

- Students may access tutorial videos keyed to the student text through either e-book or on the textbook's website: www.whfreeman.com/tps5e

- Students may access worked out examples, exercises and detailed key-stroke-level instructional videos through either e-book or on the textbook's website: www.whfreeman.com/tps5e
- Review book *Strive for a 5:* Chapter 11
- Students may access practice Free-Response questions on the College Board website: apcentral.collegeboard.com/stats
- Video Unit 29: Inference for Two-Way Tables (http://www.learner.org/courses/againstallodds/unitpages/unit29.html)

Methods of Assessments/Evaluation:

- Written quizzes and unit test
- Worksheets
- Responses to discussion questions
- Homework
- Classwork
- Verbal Assessment
- Think/Pair/Share
- Exit slips
- Self- Assessment exercises as found on textbook websites
- Independent extra credit assignments
- Observations
- Peer Editing-Grading

Resources/Including Online Resources

- Textbook website: www.whfreeman.com/tps5e
- Google Classroom
- LaunchPad
- Teacher Webpage
- Statistical Websites as referenced in textbook
- Teacher's Resource Flashdrive
- Statistical Applets as referenced in textbook
- Graphing Calculator
- AP Central College Board website and list-serve
- Annenberg-Learner Video Series: Against All Odds

Learning Goal Scale:

4 The student will analyze a two-way table to appropriately use the Chi-squared distribution to solve real world problems

3 The student will draw conclusions from a Chi-Squared significance test

2 The student will calculate the chi-square statistic, degrees of freedom, and P-value for a chi-square test

1 The student will state appropriate hypotheses and compute expected counts for a chi-square test

Unit XI: EXAMINING RELATIONSHIPS

Approximate # of Weeks: 2.5

Essential Questions:

- What is Bivariate Data?
- How can we assess the association between two variables?
- What is regression?
- How well does data fit a regression model?
- What are the properties of a linear regression model?

NJ Student Learning Standards: S-ID #5, 6a, 6b, 6c, 7, 8, 9

Upon completion of this unit students will be able to:

- Identify explanatory and response variables in situations where one variable helps to explain or influences the other.
- Make a scatterplot to display the relationship between two quantitative variables.
- Describe the direction, form, and strength of a relationship displayed in a scatterplot and recognize outliers in a scatterplot.
- Interpret the correlation coefficient.
- Understand the basic properties of correlation, including how the correlation is influenced by outliers.
- Use technology to calculate correlation.
- Explain why association does not imply causation.
- Interpret the slope and y intercept of a least-squares regression line.
- Use the least-squares regression line to predict y for a given x.
- Explain the dangers of extrapolation.
- Calculate and interpret residuals.
- Explain the concept of least squares.
- Determine the equation of a least-squares regression line using technology.
- Construct and interpret residual plots to assess if a linear model is appropriate.
- Interpret the standard deviation of the residuals and use these values to assess how well the least-squares regression line models the relationship between two variables.
- Determine the equation of a least-squares regression line using computer output.
- Describe how the slope, y intercept, standard deviation of the residuals are influenced by outliers.
- Find the slope and y intercept of the least-squares regression line from the means and standard deviations of x and y and their correlation.

Interdisciplinary Standards

- Standard 9.1 21st-Century Life & Career Skills
- Standard 8.1 Computer and Information Literacy

- Standard 8.2 Technology Education
- Standard 6.3 Active Citizenship in the 21st Century

Activities:

- Assignments and announcements will be delivered through Google Classroom
- Smartboard Lessons will be used to relay notes to students
- Students will read and study material presented in course textbook and then be challenged with questions about their reading through examples.
- Students will take notes on instructor's lecture and participate in class discussions.
- Students will navigate through the chapter using LaunchPad to access tutorial video clips, step-by-step worked out solutions to selected problems, and on-line practice quizzes.
- Instructor will provide opportunity for both guided and independent practice.
- Homework assignments will be discussed to insure a good understanding of the prerequisites.
- Technology: the graphing calculator will be integrated into various exercises to help the student visualize the problems.
- Students will be asked to make conclusions after working through explorations scattered throughout the unit.
- FRAPPY practice
- AP Multiple Choice and Free Response questions
- Special Problem**:** Are SAT Scores Linked?
- Data Exploration: Guess the Correlation
  Investigating properties of the least-squares regression line
- Statistical Applet: Correlation and Regression

Enrichment Activities:

- Students may access tutorial videos keyed to the student text through either e-book or on the textbook's website: www.whfreeman.com/tps5e
- Students may access worked out examples, exercises and detailed key-stroke-level instructional videos through either e-book or on the textbook's website: www.whfreeman.com/tps5e
- Review book *Strive for a 5:* Chapter 2
- Students may access practice Free-Response questions on the College Board website: apcentral.collegeboard.com/stats
- Video Unit 10: Scatterplots
  http://www.learner.org/courses/againstallodds/unitpages/unit10.html
- Video Unit 11: Fitting Lines to Data
  http://www.learner.org/courses/againstallodds/unitpages/unit11.html
- Video Unit 12: Correlation
  http://www.learner.org/courses/againstallodds/unitpages/unit12.html

Methods of Assessments/Evaluation:

- Written quizzes and unit test

- Worksheets
- Responses to discussion questions
- Homework
- Classwork
- Verbal Assessment
- Think/Pair/Share
- Exit slips
- Self- Assessment exercises as found on textbook websites
- Independent extra credit assignments
- Observations
- Peer Editing-Grading

Resources/Including Online Resources

- Textbook website: www.whfreeman.com/tps5e
- Google Classroom
- LaunchPad
- Teacher Webpage
- Statistical Websites as referenced in textbook
- Teacher's Resource Flashdrive
- Statistical Applets as referenced in textbook
- Graphing Calculator
- AP Central College Board website and list-serve
- Annenberg-Learner Video Series: Against All Odds

Learning Goal Scale:

4 The student will analyze bivariate data for correlation and patterns to solve real world problems

3 The student will construct appropriate regression model for bivariate data and use it to solve real world problems

2 The student will interpret slope and y-intercept in context of real world problems

1 The student will use a calculator to construct scatterplot and identify if a linear model is appropriate

Unit XII: Inference for Regression and Transformations

Approximate # of Weeks: 1.5

Essential Questions:

- How well does data fit a regression model?
- How can we use mathematical functions to "straighten out" data?
- What are the properties of a linear regression model?
- If two variables have a linear relationship, how do we test a claim about the population regression line?

NJ Student Learning Standards: S-ID # 6, 6a, 6b, 6c, S-IC # 1, 2, 4, 6

Upon completion of this unit the student will be able to:

- Check the conditions for performing inference about the slope β of the population (true) regression line.
- Interpret the values of a, b, s, SE, and r^2 in context, and determine these values from computer output.
- Construct and interpret a confidence interval for the slope of the population (true) regression line.
- Perform a significance test about the slope of the population (true) regression line.
- Use transformations involving powers and roots to find a power model that describes the relationship between two variables, and use the model to make predictions.
- Use transformations involving logarithms to find a power model or an exponential model that describes the relationship between two variables, and use the model to make predictions.
- Determine which of several transformations does a better job of producing a linear relationship.

Interdisciplinary Standards

- Standard 9.1 21st-Century Life & Career Skills
- Standard 8.1 Computer and Information Literacy
- Standard 8.2 Technology Education
- Standard 6.3 Active Citizenship in the 21st Century

Activities:

- Assignments and announcements will be delivered through Google Classroom
- Smartboard Lessons will be used to relay notes to students
- Students will read and study material presented in course textbook and then be challenged with questions about their reading through examples.
- Students will take notes on instructor's lecture and participate in class discussions.
- Students will navigate through the chapter using LaunchPad to access tutorial video clips, step-by-step worked out solutions to selected problems, and on-line practice quizzes.
- Instructor will provide opportunity for both guided and independent practice.
- Homework assignments will be discussed to insure a good understanding of the prerequisites.
- Technology: the graphing calculator will be integrated into various exercises to help the student visualize the problems.
- Students will be asked to make conclusions after working through explorations scattered throughout the unit.
- FRAPPY practice
- AP Multiple Choice and Free Response questions
- Lab Activity: The Helicopter Experiment
- Applets: The Sampling Regression Lines

Enrichment Activities:

- Students may access tutorial videos keyed to the student text through either e-book or on the textbook's website: www.whfreeman.com/tps5e
- Students may access worked out examples, exercises and detailed key-stroke-level instructional videos through either e-book or on the textbook's website: www.whfreeman.com/tps5e
- Review book *Strive for a 5:* Chapter 12
- Students may access practice Free-Response questions on the College Board website: apcentral.collegeboard.com/stats
- Video Unit 30: Inference for Regression http://www.learner.org/courses/againstallodds/unitpages/unit30.html

Methods of Assessments/Evaluation:

- Written quizzes and unit test
- Worksheets
- Responses to discussion questions
- Homework
- Classwork
- Verbal Assessment
- Think/Pair/Share
- Exit slips
- Self- Assessment exercises as found on textbook websites
- Independent extra credit assignments
- Observations
- Peer Editing-Grading

Resources/Including Online Resources

- Textbook website: www.whfreeman.com/tps5e
- Google Classroom
- LaunchPad
- Teacher Webpage
- Statistical Websites as referenced in textbook
- Teacher's Resource Flashdrive
- Statistical Applets as referenced in textbook
- Graphing Calculator
- AP Central College Board website and list-serve
- Annenberg-Learner Video Series: Against All Odds

Learning Goal Scale:

4 The student will analyze bivariate data to see if two variables have a linear relationship and test a claim about the population regression line

3 The student will draw conclusions about a linear regression model from reading a computer output or graphical displays

2 The student will use transformations involving logarithms to find a power model or an exponential model that describes the relationship between two variables

1 The student will, given the graph of a residual plot, determine which of several transformations does a better job of producing a linear relationship.

AP EXAM REVIEW

Approximate # of Weeks: 2.5

After completing the College Board AP Statistics curriculum standards, students will use the remaining time (approximately 2.5 weeks) in preparing for the AP exam. The instructor will assign AP Free Response questions daily and use the available College Board rubrics to discuss test taking strategies. Prior to the AP exam, students should be given a practice AP test. The College Board provides a practice test and this exam should be given simulating AP exam conditions as closely as possible.

Upon completion of this Review the student will be able to:

- Successfully answer selected free-response questions and multiple choice questions from previous exams.
- Understand and apply the AP exam reader's commentary and grading rubric on selected free-response questions.
- Understand and fulfill the AP free-response grading rubric.
- Be successful at mock grading sessions.

Enrichment Activities:

- Answer AP Free Response Questions from exams 2007 through current year and Multiple Choice Questions
- Simulate AP exam situation by taking a practice AP exam which will then count as 1/3 of the 4th marking period grade.
- Internet Activities: NSDL Classifying Statistical Problems

Methods of Assessment/Evaluation:

- Think/Pair/Share
- Self-Assessments
- Peer Editing-Grading
- Graded AP Free Response Questions and practice exam

POST EXAM ACTIVITIES

Students will analyze how statistics can be applied to many different disciplines and fields. To this end, they will watch appropriate videos such as the History Channel's *Breaking Vegas*, the movies *MoneyBall*, *Freakanomics*, or *A Civil Action.* As a final project, they will choose a statistical based book to read and then write a reaction paper about the book or create a video based on a Statistical topic from the class.

Lists of texts, resources, and/or literature:

PRIMARY TEXT
Starnes, Tabor, Yates. *The Practice of Stastics,* 5rd edition. New York, W.H. Freeman, 2015

REVIEW BOOK
Strive for a 5 Guide

SUPPLEMENTARY TEXTS

Bock, Velleman, and DeVeaux. *Stats Modeling the World.* 2nd edition, Boston, Massachusetts, Pearson Addison Wesley, 2007

Bohan, James F. *AP Statistics: Preparing for the Advanced Placement Examination,* 2nd edition. New York, New York, AMSCO School Publications, 2006

Millard and Turner. *Activities and Projects for High School Statistics Courses.* New York, W.H. Freeman and Company, 2004

Peck, Olsen, and Devore. *Introduction to Statistics and Data Analysis.* 2nd edition, Pacific Grove, California, Duxbury, 2004

Peck. *Activities Workbook*, Thomson Brooks and Cole, 2005

Rossman, Allan and Beth Chance. *Workshop Statistic: Discovery With Data and the Graphing Calculator.* 2nd edition, Key Curriculum Press, 2002

Scheaffer, Richard, et al. *Activity Based Statistics.* Key College Publishing, 2004

Utts, Jessica dn Rober Heckard. *Mind On Statistics,* 3rd edition, Thomson Learning, 2007

SOFTWARE

Fathom for Macintosh and Windows by Key Curriculum Press.

MATERIALS ALSO TAKEN FROM ARTICLES IN NEWSPAPERS, JOURNALS AND THE WORLD WIDE WE