

**ROBBINSVILLE PUBLIC SCHOOLS  
OFFICE OF CURRICULUM AND INSTRUCTION  
MATHEMATICS**

**Probability and Statistics**

**Board of Education**

**Mr. Thomas Halm, Jr., President  
Mrs. Shaina Ciaccio, Vice President  
Ms. Leslie Dee  
Mrs. Sharon DeVito  
Mr. Vito Galluccio  
Mr. Craig Heilman  
Mrs. Jane Luciano  
Mr. Scott Veisz  
Mr. Richard Young  
Dr. Kathie Foster, Superintendent  
Dr. Kimberly Tew, Assistant Superintendent**

**Curriculum Writing Committee  
Tiffany Brennan, Mathematics Supervisor**

**BOARD OF EDUCATION INITIAL ADOPTION DATE:**

**2017**

### **Course Philosophy**

The content of a mathematics course is brought to life when the student is involved in investigating real-world applications using inductive reasoning, cooperative learning, and critical thinking skills. To be able to communicate effectively in mathematics, a student needs to have a conceptual understanding of the mathematical topics. Use of technology and the use of real-world data will expand the students' mathematics experience so that they are able to solve real problems, reason effectively, make logical connections, and think mathematically.

### **Course Description**

This course is designed for seniors who want a better background in probability and statistics. A student in this course will need very little algebra, but it will come in handy on a few occasions. This provides students a chance to make a fresh start if they have had difficulty with "math" in the past. A course in applied statistics and probability gives these students a chance to be successful in a "math" course. Key components of the course include data collection, organization and representation, sampling, measures of central tendency, variance and correlation, probability distributions, hypotheses tests, and analysis and inference. Students will problem solve, collaborate and apply their statistical knowledge through applications and projects. Technology will be used not only to simplify calculation and display charts and graphs, but also to generate and access appropriate data for activities and projects.

Probability and Statistics Pacing Guide		
Content	Section(s)	Block(s)
<b>Unit 1: Collecting Data</b>		
Introduction to Data Collection	3.1	0.5
Sampling: Good and Bad	3.2	0.5
Simple Random Samples	3.3	1
Estimating a Margin of Error	3.4	0.5
Sampling and Surveys	3.5	0.5
Observational Studies and Experiments	3.6	0.5
How to Experiment Well	3.7	0.5
Inference for Experiments	3.8	0.5
Using Studies Wisely	3.9	0.5
Flex Day(s)		1
Review and Test		2
<b>Unit 2: Analyzing One-Variable Data</b>		
Statistics: The Science and Art of Data	1.1	0.5
Displaying Categorical Data	1.2	1
Displaying Quantitative Data: Dotplots	1.3	0.5
Displaying Quantitative Data: Stemplots	1.4	0.5
Displaying Quantitative Data: Histograms	1.5	0.5
Measuring Center	1.6	0.5
Measuring Variability	1.7	1
Summarizing Quantitative Data: Boxplots and Outliers	1.8	1
Describing Location in a Distribution	1.9	0.5
Flex Day(s)		1
Review and Test		2

<b>Unit 3: Analyzing Two-Variable Data</b>		
Relationships Between Two Categorical Variables	2.1	0.5
Relationships Between Two Quantitative Variables	2.2	0.5
Correlation	2.3	0.5
Calculating the Correlation	2.4	0.5
Regression Lines	2.5	0.5
The Least-Squares Regression Line	2.6	0.5
Assessing a Regression Model	2.7	0.5
Fitting Models to Curved Relationships	2.8	0.5
Flex Day(s)		1
Review and Test		2
<b>Unit 4: Probability</b>		
Randomness, Probability, and Simulation	4.1	0.5
Basic Probability Rules	4.2	0.5
Two-Way Tables and Venn Diagrams	4.3	0.5
Conditional Probability and Independence	4.4	1
The General Multiplication Rule and Tree Diagrams	4.5	0.5
The Multiplication Rule for Independent Events	4.6	0.5
The Multiplication Counting Principle and Permutations	4.7	0.5
Combinations and Probability	4.8	0.5
Flex Day(s)		1.5
Review and Test		2

<b>Unit 5: Random Variables</b>		
Two Types of Random Variables	5.1	0.5
Analyzing Discrete Random Variables	5.2	0.5
Binomial Random Variables	5.3	0.5
Analyzing Binomial Random Variables	5.4	0.5
Continuous Random Variables	5.5	0.5
The Standard Normal Distribution	5.6	0.5
Normal Distribution Calculations	5.7	0.5
Flex Day(s)		1.5
Review and Test		2
<b>Unit 6: Sampling Distributions</b>		
What is a Sampling Distribution?	6.1	1.5
Sampling Distributions: Center and Variability	6.2	1.5
<i>The Sampling Distribution of a Sample Count (The Normal Approximation to the Binomial)</i>		<i>optional</i>
The Sampling Distribution of a Sample Proportion	6.4	0.5
The Sampling Distribution of a Sample Mean	6.5	0.5
The Central Limit Theorem	6.6	1
Flex Day(s)		1
Review and Test		2
<b>Unit 7: Estimating a Parameter</b>		
The Idea of a Confidence Interval	7.1	0.5
What Affects the Margin of Error?	7.2	0.5
Estimating a Proportion	7.3	0.5
Confidence Intervals for a Proportion	7.4	0.5
Estimating a Mean	7.5	1.5
Confidence Intervals for a Mean	7.6	1
Flex Day(s)		1.5
Review and Test		2

<b>Unit 8: Testing a Claim</b>		
The Idea of a Significance Test	8.1	0.5
Significance Tests and Decision Making	8.2	0.5
Testing a Claim about a Proportion	8.3	0.5
Significance Tests for a Proportion	8.4	1
Testing a Claim about a Mean	8.5	0.5
Significance Tests for a Mean	8.6	1
Flex Day(s)		1
Review and Test		2
<b>Unit 9: Comparing Two Populations or Treatments</b>		
Estimating a Difference Between Two Proportions	9.1	1
Testing a Claim about a Difference Between Two Proportions	9.2	1
Estimating a Difference Between Two Means	9.3	1
Testing a Claim about a Difference Between Two Means	9.4	1
Analyzing Paired Data: Estimating a Mean Difference	9.5	1
Testing a Claim about a Mean Difference	9.6	1
Flex Day(s)		1
Review and Test		2
<b>Unit 10: Inference for Distributions and Relationships</b>		
Testing the Distribution of a Categorical Variable	10.1	1
Chi-Square Tests for Goodness of Fit	10.2	1
Testing the Relationship Between Two Categorical Variables	10.3	1
Chi-Square Tests for Association	10.4	0.5
Testing the Relationship Between Two Quantitative Variables	10.5	1
<i>Inference for the Slope of a Least-Squares Regression Line</i>	10.6	<i>optional</i>
Flex Day(s)		1.5
Review and Test		2
<b>Unit 11: Culminating Project</b>		

Incorporate all that has been learned	1.1-10.5	5
---------------------------------------	----------	---

**84 total  
blocks**



## Unit 1: Collecting Data

**Enduring Understanding / Big Idea:** Students will plan and design data collection, properly allowing chance into the process

**Essential Questions:** How do we properly allow chance into the data collection process?  
Why do we want to allow chance into the data collection process?  
What's the difference between random sampling and random design?

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
HSS-IC.B.3	<b><u>Students will be able to:</u></b>  Distinguish statistical questions from other types of questions  Identify the population and sample in a statistical study  Distinguish between an observational study and an experiment (3.1)	Do you have dinner plans?	Assignment: 1-17 odd, 21  Entrance ticket  Checkpoint exercises  Partner quiz  Exit ticket	0.5

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
----------------------------------	-----------	----------------------	------------	------------------

HSS-IC.B.3	<p><b><u>Students will be able to:</u></b></p> <p>Describe how convenience sampling can lead to bias</p> <p>Describe how voluntary response sampling can lead to bias</p> <p>Explain how random sampling can help to avoid bias (3.2)</p>	<p>Who wrote the federalist papers?</p> <p>Still on the phone?</p>	<p>Assignment: 1-15 odd, 19</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5
HSS-IC.B.3	<p>Describe how to obtain a simple random sample using slips of paper or technology</p> <p>Explain the concept of sampling variability and the effect of increasing sample size</p> <p>Use simulation to test a claim about a population proportion (3.3)</p>	<p><i>Technology:</i> Choosing an SRS on a TI-83/84</p> <p>Do students prefer name-brand cookies?</p> <p>Do you tweet?</p> <p><i>Technology:</i> Use the One Categorical Variable applet at <a href="http://www.highschool.bfwpub.com/spa3e">www.highschool.bfwpub.com/spa3e</a> to simulate the number of successes in a random sample.</p>	<p>Assignment: 1-13 odd, 19</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	1



Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
----------------------------------	-----------	----------------------	------------	---------------

<p>HSS-IC.B.3 HSS-IC.B.4</p>	<p><b><u>Students will be able to:</u></b> Use simulation to approximate the margin of error for a sample proportion and interpret the margin of error</p> <p>Use simulation to approximate the margin of error for a sample mean and interpret the margin of error (3.4)</p>	<p><i>Technology:</i> Use the One Categorical Variable applet at <a href="http://www.highschool.bfwpub.com/spa3e">www.highschool.bfwpub.com/spa3e</a> to help estimate the margin of error for a proportion</p> <p><i>Technology:</i> Use the One Categorical Variable applet at <a href="http://www.highschool.bfwpub.com/spa3e">www.highschool.bfwpub.com/spa3e</a> to help estimate the margin of error for a mean</p> <p>Can you roll your tongue?</p>	<p>Assignment: 1-15 odd, 19</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	<p>0.5</p>
	<p><i>Flex Day</i></p>	<p>Reteach (if needed), do an activity or two, give a quiz, work on student projects, show one or more of the online videos.</p>		<p>0.5</p>
<p>HSS-IC.B.3</p>	<p>Explain how undercoverage can lead to bias</p> <p>Explain how nonresponse can lead to bias</p> <p>Explain how other aspects of a sample survey can lead to bias (3.5)</p>	<p>Who did you say is calling? <i>Literary Digest?</i></p>	<p>Assignment: 1-17 odd, 21</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	<p>0.5</p>

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
----------------------------------	-----------	----------------------	------------	------------------

HSS-IC.B.3	<p><b><u>Students will be able to:</u></b></p> <p>Explain the concept of confounding and how it limits the ability to make cause-and-effect conclusions</p> <p>Explain the purpose of comparison in an experiment</p> <p>Describe the placebo effect and the purpose of blinding in an experiment (3.6)</p>	What happens when physicians study themselves?	<p>Assignment: 1-17 odd, 21</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5
HSS-IC.B.3	<p>Describe how to randomly assign treatments using slips of paper or technology</p> <p>Explain the purpose of random assignment in an experiment</p> <p>Identify other sources of variability in an experiment and explain the benefits of keeping these variables the same for all experimental units (3.7)</p>	Multitasking? Or multiple distractions?	<p>Assignment: 1-15 odd, 21</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5



Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
----------------------------------	-----------	----------------------	------------	------------------

HSS-IC.A.1	<p><b><u>Students will be able to:</u></b></p> <p>Outline an experiment that uses a completely randomized design</p> <p>Explain the concept of statistical significance in the context of an experiment</p> <p>Use simulation to determine if the difference between two means or two proportions in an experiment is significant (3.8)</p>	<p>Drawing conclusions from the caffeine experiment</p> <p>Does fish oil affect blood pressure?</p>	<p>Assignment: 1-13 odd, 17</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5
HSS-IC.A.1	<p>Identify when it is appropriate to use information from a sample to make an inference about a population and when it is appropriate to make an inference about cause and effect</p> <p>Evaluate if a statistical study has been carried out in an ethical manner (3.9)</p>	<p>Is foster care better for children than an orphanage?</p>	<p>Assignment: 1-13 odd, 17</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
	<u>Students will be able to:</u>  <i>Flex Day</i>	Reteach (if needed), do an activity or two, give a quiz, work on student projects, show one or more of the online videos.		0.5
	Chapter 3 Review	Chapter 3 Practice Test	Ch. 3 Review Exercises 1-10	1
	Chapter 3 Test/Project	Chapter 3 Test		1

## Unit 2: Analyzing One-Variable Data

**Enduring Understanding / Big Idea:** Students will learn how to organize, display, summarize, and interpret data.

**Essential Questions:** What is data? How can we organize and display it?

How do we know which type of display is appropriate for different types of data?

What different ways can we numerically summarize quantitative data?

How can we describe location in a distribution?

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
HSS-ID.A.1	<p><b><u>Students will be able to:</u></b></p> <p>Identify the individuals and variables in a data set, then classify the variables as categorical or quantitative</p> <p>Summarize the distribution of a variable with a frequency table or a relative frequency table</p> <p>(1.1)</p>	<p>The “1 in 6 wins” game</p> <p>Alternate examples from the Annotated Teachers’ Edition</p>	<p>Assignment: 1-13 odds</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5
			Assignment: 1-17 odd,	

HSS-ID.A.1	<p>Make and interpret bar charts of categorical data</p> <p>Interpret pie charts</p> <p>Identify what makes some graphs of categorical data deceptive</p> <p>(1.2)</p>	<p>Which cell phone speaks to you?</p> <p>Making bar charts and pie charts with technology (<a href="http://www.tinyurl.com/SPAapplets">www.tinyurl.com/SPAapplets</a>) and graphing calculator</p>	<p>21</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	<p>\</p> <p>1</p>
------------	--	---	---	-------------------

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
HSS-ID.A.1 HSS-ID.A.2	<p><b><u>Students will be able to:</u></b></p> <p>Make and interpret dotplots of quantitative data</p> <p>Describe the shape of a distribution</p> <p>Compare distributions of quantitative data with dotplots</p> <p>(1.3)</p>	<p>How can we check the health of a stream?</p> <p>Making a dotplot using an applet (<a href="http://www.tinyurl.com/SPAapplets">www.tinyurl.com/SPAapplets</a>)</p>	<p>Assignment: 1-19 odd</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5
HSS-ID.A.1 HSS-ID.A.2	<p>Make stemplots of quantitative data</p> <p>Interpret stemplots</p> <p>Compare distributions of quantitative data with stemplots</p> <p>(1.4)</p>	<p>How many shoes are too many shoes?</p> <p>Using an applet to make a stemplot (<a href="http://www.tinyurl.com/SPAapplets">www.tinyurl.com/SPAapplets</a>)</p>	<p>Assignment: 1-13 odd, 17</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5

--	--	--	--	--

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
HSS-ID.A.1 HSS-ID.A.2	<p><b><u>Students will be able to:</u></b></p> <p>Make histograms of quantitative data</p> <p>Interpret histograms</p> <p>Compare distributions of quantitative data with histograms</p> <p>(1.5)</p>	<p><i>Three is Company</i></p> <p>Making a histogram with an applet or graphing calculator: One Quantitative Variable applet (<a href="http://www.tinyurl.com/SPAapplets">www.tinyurl.com/SPAapplets</a>), or TI-83/84</p>	<p>Assignment: 1-15 odd, 19</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5
	<i>Flex Day</i>	<i>Reteach(if needed), do an activity or two, give a quiz, work on student projects, show one or more of the online videos</i>		0.5
HSS-ID.A.2 HSS-ID.A.3	<p>Find and interpret the median of a distribution of quantitative data</p> <p>Calculate the mean of a distribution of quantitative data</p> <p>Compare the mean and median of a distribution, and choose the more appropriate measure of center in a given setting</p> <p>(1.6)</p>	<p>Mean as a “balance point”</p>	<p>Assignment: 1-17 odd, 21</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5



--	--	--	--	--

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
HSS-ID.A.2 HSS-ID.A.3	<p><b><u>Students will be able to:</u></b></p> <p>Find the range of a distribution of quantitative data</p> <p>Find and interpret the interquartile range</p> <p>Calculate and interpret the standard deviation (1.7)</p>	<p><i>Did Mr. Starnes Stack His Class?</i></p> <p>Technology: Computing Numerical Summaries with Technology - - <i>One Quantitative Variable</i> applet (<a href="http://www.tinyurl.com/SPAapplets">www.tinyurl.com/SPAapplets</a>), or TI-83/84</p>	<p>Assignment: 1-17 odd, 21</p> <p>Application 1.7: Have we found the beef?</p>	1
HSS-ID.A.2 HSS-ID.A.3	<p>Use the 1.5 x IQR rule to identify outliers</p> <p>Make and interpret boxplots of quantitative data</p> <p>Compare distributions of quantitative data with boxplots (1.8)</p>	<p>Which is best in reducing stress?</p> <p>Making boxplots with technology: Technology: Computing Numerical Summaries with Technology - - <i>One Quantitative Variable</i> applet (<a href="http://www.tinyurl.com/SPAapplets">www.tinyurl.com/SPAapplets</a>), or TI-83/84</p>	<p>Assignment: 1-17 odd</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	1

--	--	--	--	--

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
----------------------------------	-----------	----------------------	------------	------------------

HSS-ID.A.3 HSS-ID.A.4	<p><b><u>Students will be able to:</u></b></p> <p>Find and interpret a percentile in a distribution of quantitative data</p> <p>Estimate percentiles and individual values using a cumulative relative frequency graph</p> <p>Find and interpret a standardized score (z-score) in a distribution</p> <p>(1.9)</p>	Which states are rich?	<p>Assignment: 1-17 odd, 21</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5
	<i>Flex Day</i>	<i>Reteach(if needed), do an activity or two, give a quiz, work on student projects, show one or more of the online videos</i>		0.5
	Ch. 1 Review	Ch. 1 Review Exercises 1-14		1
	Chapter 1 Student Project/Test			1

			Chapter 1 Student Project	
--	--	--	------------------------------	--



**Unit 3: Analyzing Two-Variable Data**

**Enduring Understanding / Big Idea:** Students will learn how to organize, display, and summarize the relationship between two variables.

**Essential Questions:**

- How do we analyze two-variable data?
- How do we display two-variable data?
- How do we model linear associations?
- How is correlation measured and analyzed?
- How do we model nonlinear associations?

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
----------------------------------	-----------	----------------------	------------	------------------



<p>HSS-ID.B.5 HSS-ID.B.6</p>	<p><b><u>Students will be able to:</u></b></p> <p>Distinguish between explanatory and response variables for categorical data.</p> <p>Make segmented bar graphs to display the relationship between two categorical variables.</p> <p>Determine if there is an association between two categorical variables. Describe the association. (2.1)</p>	<p>Which finger is longer?</p> <p>Analyzing two categorical variables with Technology: <i>Two Categorical Variables</i> applet (<a href="http://www.highschool.bfwpub.com/spa3e">www.highschool.bfwpub.com/spa3e</a> )</p>	<p>Assignment: 1-15 odd, 21</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	<p>0.5</p>
----------------------------------	---	--	---	------------

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
----------------------------------	-----------	----------------------	------------	------------------

HSS-ID.B.5 HSS-ID.B.6 HSS-ID.B.6a	<p><b><u>Students will be able to:</u></b></p> <p>Distinguish between explanatory and response variables for quantitative data.</p> <p>Make a scatterplot to display the relationship between two quantitative variables.</p> <p>Describe the direction, form, and strength of a relationship displayed in a scatterplot and identify outliers. (2.2)</p>	<p>More sugar, more calories?</p> <p>Making a Scatterplot with Technology using the <i>Two Quantitative Variables</i> applet (<a href="http://www.highschool.bfwpub.com/spa3e">www.highschool.bfwpub.com/spa3e</a>)</p>	<p>Assignment: 1-17 odd, 21</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5
HSS-ID.B.8 HSS-ID.B.9	<p>Estimate the correlation between two quantitative variables from a scatterplot</p> <p>Interpret the correlation</p> <p>Distinguish correlation from causation (2.3)</p>	<p>Guess the Correlation (applet found at <a href="http://www.rossmanchance.com/applets">www.rossmanchance.com/applets</a> )</p> <p><i>If I eat more chocolate, will I win a Nobel Prize?</i> application</p>	<p>Assignment: 1-15 odd, 21</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5

--	--	--	--	--



Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
----------------------------------	-----------	----------------------	------------	------------------

HSS-ID.B.8 HSS-ID.B.9	<p><b><u>Students will be able to:</u></b></p> <p>Calculate the correlation between two quantitative variables</p> <p>Understand the properties of the correlation</p> <p>Describe how outliers influence the correlation</p> <p>(2.4)</p>	<p><i>Correlation and Regression</i> applet at (<a href="http://www.highschool.bfwpub.com/spa3e">www.highschool.bfwpub.com/spa3e</a>)</p> <p>Flying dinosaur or early bird? activity</p> <p><i>Two Quantitative Variables</i> applet for calculating the correlation at <a href="http://www.highschool.bfwpub.com/spa3e">www.highschool.bfwpub.com/spa3e</a></p>	<p>Assignment: 1-15 odd, 21</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5
	<i>Flex Day</i>	<p>Reteach (if needed), do an activity or two, give a quiz, work on student projects, show one or more of the online videos.</p>		0.5
HSS-ID.B.6c HSS-ID.B.7	<p>Make predictions using regression lines. Explain the dangers of extrapolation.</p> <p>Calculate and interpret a residual</p> <p>Interpret the slope and y intercept of a regression line.</p> <p>(2.5)</p>	<p>Do cut flowers benefit from sugar in the water?</p>	<p>Assignment: 1-15 odd, 19</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5





Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
HSS-ID.B.6a HSS-ID.B.6c	<p><b><u>Students will be able to:</u></b></p> <p>Calculate the equation of the least-squares regression line using technology</p> <p>Calculate the equation of the least-squares regression line using summary statistics</p> <p>Describe how outliers affect the least-squares regression line (2.6)</p>	<p>Calculate the equation of the LSRL using an applet (<a href="http://www.highschool.bfwpub.com/spa3e">www.highschool.bfwpub.com/spa3e</a>) or a graphing calculator</p> <p>Outliers and LSRL - <i>Correlation and Regression</i> applet at <a href="http://www.highschool.bfwpub.com/spa3e">www.highschool.bfwpub.com/spa3e</a></p> <p>Did the Broncos buck the trend?</p>	<p>Assignment: 1-11 odd, 19</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5
HSS-ID.B.6b HSS-ID.B.7	<p>Use a residual plot to determine whether a regression model is appropriate</p> <p>Interpret the standard deviation of the residuals</p> <p>Interpret <math>r^2</math> (2.7)</p>	<p>Do higher priced tablets have better battery life?</p> <p>Use <a href="http://www.highschool.bfwpub.com/spa3e">www.highschool.bfwpub.com/spa3e</a> or a TI-83/84 to make a residual plot, calculate <math>r^2</math>, and s (applet only)</p>	<p>Assignment: 1-17 odd, 21</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5



Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
HSS-ID.B.6a	<p><b><u>Students will be able to:</u></b></p> <p>Use technology to calculate quadratic models for curved relationships then calculate and interpret residuals using the model.</p> <p>Use technology to calculate exponential models for curved relationships, then calculate and interpret residuals using the model</p> <p>Use residual plots to determine the most appropriate model. (2.8)</p>	<p>Calculate a Quadratic Model using the applet at <a href="http://www.highschoolmath.bfwpub.com/spa3e">www.highschoolmath.bfwpub.com/spa3e</a> or a graphing calculator</p> <p>Calculate an Exponential Model using the applet at <a href="http://www.highschoolmath.bfwpub.com/spa3e">www.highschoolmath.bfwpub.com/spa3e</a> or a graphing calculator</p> <p>How does life insurance work?</p>	<p>Assignment: 1-11 odd, 17</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5
	<i>Flex Day</i>	Reteach (if needed), do an activity or two, give a quiz, work on student projects, show one or more of the online videos.		0.5
	Chapter 2 Review	Ch. 2 Review Exercises 1-13	Ch. 2 Practice Test	1
	Chapter 2 Test/project			1

## Unit 4: Probability

**Enduring Understanding / Big Idea:** Chance behavior is unpredictable in the short run but has a regular and predictable pattern in the long run; this long-run relative frequency is called its probability.

**Essential Questions:**

- What are the basic rules of probability?
- What is simulation used for?
- How do you calculate conditional probabilities?
- How do we use the multiplication counting principle to determine the total number of outcomes?

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
HSS-CP.A.1 HSS-CP.B.7	<b><u>Students will be able to:</u></b>  Interpret probability as a long-run relative frequency  Dispel common myths about randomness  Use simulation to model chance behavior (4.1)	What is probability?  Will the train arrive on time?	Assignment: 1-15 odd, 19  Entrance ticket  Checkpoint exercises  Partner quiz  Exit ticket	0.5



Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
----------------------------------	-----------	----------------------	------------	------------------

<p>HSS-CP.A.1 HSS-CP.B.7</p>	<p><b><u>Students will be able to:</u></b></p> <p>Give a probability model for a chance process with equally likely outcomes and use it to find the probability of an event.</p> <p>Use the complement rule to find probabilities</p> <p>Use the addition rule for mutually exclusive events to find probabilities (4.2)</p>	<p>How prevalent is high cholesterol?</p>	<p>Assignment: 1-13 odd, 17</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	<p>0.5</p>
<p>HSS-CP.B.6 HSS-CP.B.7</p>	<p>Use a two-way table to find probabilities</p> <p>Calculate probabilities with the general addition rule</p> <p>Use a Venn diagram to find probabilities (4.3)</p>	<p>Who owns a home?</p>	<p>Assignment: 1-15 odd, 19</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	<p>0.5</p>

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
----------------------------------	-----------	----------------------	------------	------------------



HSS-CP.A.2 HSS-CP.A.4	<u><b>Students will be able to:</b></u>  Find and interpret conditional probabilities using two-way tables  Use the conditional probability formula to calculate probabilities  Determine whether two events are independent (4.4)	Who earns A's in college?	Assignment: 1-17 odd, 21  Entrance ticket  Checkpoint exercises  Partner quiz  Exit ticket	1
	<i>Flex Day</i>	Give the Lesson 4.1-4.4 Quiz, show one or more of the online videos listed in the Additional Chapter 4 Resources, or re-teach (if needed)		1
HSS-CP.A.2 HSS-CP.A.3	Use the general multiplication rule to calculate probabilities  Use a tree diagram to model a chance process involving a sequence of outcomes  Calculate conditional probabilities using tree diagrams (4.5)	Not milk?	Assignment: 1-13 odd, 19  Entrance ticket  Checkpoint exercises  Partner quiz  Exit ticket	0.5

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
HSS-CP.A.2 HSS-CP.A.5 HSS-CP.B.8	<p><b><u>Students will be able to:</u></b></p> <p>Use the multiplication rule for independent events to calculate probabilities</p> <p>Calculate <math>P(\text{at least one})</math> using the complement rule and the multiplication rule for independent events</p> <p>Determine if it is appropriate to use the multiplication rule for independent events in a given setting (4.6)</p>	How should we interpret genetic screening?	<p>Assignment: 1-13 odd, 17</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5
HSS-CP.B.9	<p>Use the multiplication counting principle to determine the number of ways to complete a process involving several steps.</p> <p>Use factorials to count the number of permutations of a group of individuals</p> <p>Compute the number of permutations of <math>n</math> individuals taken <math>k</math> at a time</p>	<p>Do you scream for ice cream?</p> <p><i>Technology:</i> Calculating Factorials and Permutations using an applet or Ti-83/84 (<a href="http://www.highschoolbfpwpub.com/spa3e">www.highschoolbfpwpub.com/spa3e</a>; launch the <i>Probability</i> applet)</p>	<p>Assignment: 1-15 odd, 19</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5

	(4.7)			
--	-------	--	--	--

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
HSS-CP.B.9	<p><b><u>Students will be able to:</u></b></p> <p>Compute the number of combinations of <math>n</math> individuals taken <math>k</math> at a time</p> <p>Use combinations to calculate probabilities</p> <p>Use the multiplication counting principle and combinations to calculate probabilities (4.8)</p>	<p>How many ways can you set up an iPod play list?</p> <p><i>Technology:</i> Use an applet or TI-83/84 to compute the number of combinations of <math>n</math> individuals taken <math>r</math> at a time.  <a href="http://www.highschool.bfwpub.com/spa3e">www.highschool.bfwpub.com/spa3e</a>; launch the <i>Probability</i> applet)</p>	<p>Assignment: 1-15 odd, 19</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5
	<i>Flex Day</i>	<p>This is a great day to have students work in groups on the Stats Applied! at the end of Lesson 4.8. Also consider showing one or more of the online videos listed in the Additional Chapter 4 Resources, giving the Lesson 4.5-4.8 Quiz, or re-teaching (if needed).</p>	<p>Optional assignment: 4.5 ex14, 4.6 ex14, 4.7 ex14, 4.8 ex14</p>	0.5
	Chapter 4 Review	Ch. 4 Practice Test	Ch. 4 Review Exercises 1—8	0.5

	Chapter 4 Test	Chapter 4 Test		1
--	----------------	----------------	--	---



## Unit 5: Random Variables

**Enduring Understanding / Big Idea:** Students will be able to describe the shape, center, and variability of distributions of random variables and compute probabilities from those distributions, including binomial and normal distributions.

**Essential Questions:**

- What are the differences between discrete and random variables?
- How do you find probabilities from a Binomial Distribution?
- How do you find probabilities from a Normal Distribution?
- How can you find probabilities from discrete random variables?

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
HSS-MD.A1	<p><b><u>Students will be able to:</u></b></p> <p>Verify that the probability distribution of a discrete random variable is valid</p> <p>Calculate probabilities involving a discrete random variable</p> <p>Classify a random variable as discrete or continuous (5.1)</p>	Making the grade?	<p>Assignment: 1-17 odd</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
-------------------------------	-----------	----------------------	------------	------------------



<p>HSS-MD.A1 HSS-MD.A2</p>	<p><b><u>Students will be able to:</u></b></p> <p>Make a histogram to display the probability distribution of a discrete random variable and describe its shape</p> <p>Calculate and interpret the mean (expected value) of a discrete random variable</p> <p>Calculate and interpret the standard deviation of a discrete random variable (5.2)</p>	<p>How much do college grades vary?</p> <p><i>Technology:</i> Analyzing Discrete Random Variables with Technology (<a href="http://www.highschool.bfwpub.com/spa3e">www.highschool.bfwpub.com/spa3e</a>); launch the <i>Probability</i> applet</p>	<p>Assignment: 1-15 odd, 19</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	<p>0.5</p>
	<p>Determine whether or not a given scenario is a binomial setting</p> <p>Calculate probabilities involving a single value of a binomial random variable</p> <p>Make a histogram to display a binomial distribution and describe its shape (5.3)</p>	<p>Pop quiz!</p> <p>Is the train binomial?</p> <p><i>Technology:</i> Use an applet or TI-83/84 to graph a binomial distribution and calculate binomial probabilities (<a href="http://www.highschool.bfwpub.com/spa3e">www.highschool.bfwpub.com/spa3e</a>); choose <i>Binomial Distribution</i>)</p>	<p>Assignment: 1-13 odd, 17</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	<p>0.5</p>

	<p>Graph and write equations using point-slope form (5.4)</p>			
--	---	--	--	--

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
-------------------------------	-----------	----------------------	------------	------------------

HAS-APR.C.5	<p><b><u>Students will be able to:</u></b></p> <p>Calculate and interpret the mean and standard deviation of a binomial distribution</p> <p>Find probabilities involving several values of a binomial random variable</p> <p>Use technology to calculate cumulative binomial probabilities (5.4)</p>	<p><i>Technology:</i> Use the <i>Probability Applet</i> or a TI-83/84 to calculate cumulative binomial probabilities</p> <p>Free lunch?</p>	<p>Assignment: 1-13 odd, 17</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5
	<i>Flex Day</i>	Give the Lesson 5.1-5. Quiz, show one or more of the online videos listed in the Additional Chapter 5 Resources, or re-teach(if needed).	Optional assignment: 5.1 ex14, 5.2 ex16, 5.3 ex14, 5.4 ex14	1
HSS-ID.A.4	<p>Show that the probability distribution of a continuous random variable is valid and use the distribution to calculate probabilities</p> <p>Determine the relative locations of the mean and median of a continuous random variable from the shape of its probability distribution</p> <p>Draw a normal probability distribution with a given mean and standard deviation (5.5)</p>	Still waiting for the server?	<p>Assignment: 1-15 odd, 19</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5

	<p>Find slopes of parallel and perpendicular lines (5.6)</p> <p>Write equations of parallel and perpendicular lines, given data (5.6)</p>			
--	---	--	--	--



Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
HSS-ID.A.4	<p><b><u>Students will be able to:</u></b></p> <p>Use the 68-95-99.7 rule to find approximate probabilities in a normal distribution</p> <p>Use Table A to find a probability (area) from a z-score in the standard normal distribution</p> <p>Use Table A to find a z-score from a probability (area) in the standard normal distribution (5.6)</p>	<p>What's so special about normal distributions?</p> <p>What's a good batting average?</p>	<p>Assignment: 1-13 odd, 17</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5
HSS-ID.A.4	<p>Calculate the probability that a value falls within a given interval in a normal distribution</p> <p>Find a value corresponding to a given probability (area) in a normal distribution (5.7)</p>	<p>What cholesterol levels are unhealthy for teen boys?</p> <p><i>Technology:</i> Finding Values from Probabilities in Any Normal Distribution, and Vice Versa (using the <i>Probability</i> applet and the TI-83/84)</p>	<p>Assignment: 1-13 odd, 17</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
	<u>Students will be able to:</u>  <i>Flex Day</i>	This is a great day to have students work in groups on the <i>Stats Applied!</i> at the end of Lesson 5.7. Also consider showing one or more of the online videos listed in the Additional Chapter 5 Resources, giving the Lesson 5.5-5.7 Quiz, or reteaching (if needed).	Optional assignment: 5.5 ex14, 5.5 ex16, 5.6 ex14, 5.7 ex14	0.5
	Ch. 5 Review	Chapter 5 Practice Test	Ch.5 Review Exercises 1—8	1
	Chapter 5 Test	Chapter 5 Test		1



**Unit 6: Sampling Distributions**

**Enduring Understanding / Big Idea:** A sampling distribution describes the possible values of a statistic such as the sample mean or the sample proportion and how often they occur. Center, variability, and shape are examined in detail.

**Essential Questions:**      What is a Sampling Distribution?  
   How do we determine if a statistic is an unbiased estimator of a population parameter?  
   What does the Central Limit Theorem tell us about sampling distributions?

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
-------------------------------	-----------	----------------------	------------	------------------

HSS-IC.B.3	<p><b><u>Students will be able to:</u></b></p> <p>Distinguish between a parameter and a statistic</p> <p>Create a sampling distribution using all possible samples from a small population</p> <p>Use the sampling distribution of a statistic to evaluate a claim about a parameter (6.1)</p>	<p>A penny for your thoughts? (day 1)</p> <p>How cold is it inside the cabin? (day 2)</p>	<p>Assignment: 1-15 odd, 19</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	1.5
------------	--	---	---	-----

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
-------------------------------	-----------	----------------------	------------	------------------

HSS-IC.B.3	<p><b><u>Students will be able to:</u></b></p> <p>Determine if a statistic is an unbiased estimator of a population parameter</p> <p>Describe the relationship between sample size and the variability of a statistic (6.2)</p>	<p>How many craft sticks are in the bag? (day 1)</p> <p>How many tanks does the enemy have? (day 2)</p>	<p>Assignment: 1-15 odd, 19</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	1.5
HSS.ID.A.3 HSS.ID.A.4	<p>Calculate the mean and the standard deviation of the sampling distribution of a sample count and interpret the standard deviation</p> <p>Determine if the sampling distribution of a sample count is approximately normal</p> <p>If appropriate, use the normal approximation to the binomial distribution to calculate probabilities involving a sample count (6.3)</p>	<p>Simulating with the Normal Approximation to Binomial Distributions applet (<a href="http://www.highschool.bfwpub.com/spa3e">www.highschool.bfwpub.com/spa3e</a>)</p> <p>How can we check for bias in a survey?</p>	<p>Assignment: 1-15 odd, 19</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	<b>OPTIONAL (IF TIME ALLOWS)</b>
	<i>Flex Day</i>	Consider giving a quiz on lessons 6.1-6.3, showing one or more of the online videos, or re-teaching (if needed)	Optional assignment: 6.1 ex12, 6.2 ex10, 6.2 ex14, 6.3 ex 14	0.5

--	--	--	--	--

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
-------------------------------	-----------	----------------------	------------	------------------

HSS.ID.A.3 HSS.ID.A.4	<p><b><u>Students will be able to:</u></b></p> <p>Calculate the mean and standard deviation of the sampling distribution of a sample proportion <math>\hat{p}</math> and interpret the standard deviation</p> <p>Determine if the sampling distribution of <math>\hat{p}</math> is approximately normal</p> <p>If appropriate, use a normal distribution to calculate probabilities involving <math>\hat{p}</math> (6.4)</p>	<p>Sampling from the candy machine (<a href="http://www.rossmanchance.com/applets">www.rossmanchance.com/applets</a> )</p> <p>What's that spot on my potato chip?</p>	<p>Assignment: 1-15 odd, 19</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5
HSS.ID.A.3 HSS.ID.A.4	<p>Find the mean and standard deviation of the sampling distribution of a sample mean <math>\bar{x}</math> and interpret the standard deviation</p> <p>Use a normal distribution to calculate probabilities involving <math>\bar{x}</math> when sampling from a normal population (6.5)</p>	<p>Sampling from a normal population applet (<a href="https://onlinestatbook.com/stat_sim/sampling_dist">https://onlinestatbook.com/stat_sim/sampling_dist</a> )</p> <p>Any college women taller?</p>	<p>Assignment: 1-15 odd, 19</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5

	<p>Use real world applications to linear inequalities and systems of linear inequalities (6.5, 6.6)</p>			
--	---	--	--	--



Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
-------------------------------	-----------	----------------------	------------	------------------

HSS.ID.A.3 HSS.ID.A.4	<p><b><u>Students will be able to:</u></b></p> <p>Determine if the sampling distribution of <math>\bar{x}</math> is approximately normal when sampling from a non-normal population</p> <p>If appropriate, use a normal distribution to calculate probabilities involving <math>\bar{x}</math> (6.6)</p>	<p>Sampling from a non-normal population (<a href="https://onlinestatbook.com/stat_sim/sampling_dist">https://onlinestatbook.com/stat_sim/sampling_dist</a> )</p> <p>Keeping things cool with statistics?</p>	<p>Assignment: 1-15 odd, 19</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	1
	<i>Flex Day</i>	<p>This is a great day to have students work in groups on the <i>Stats Applied!</i> at the end of Lesson 6.6. Also consider showing one or more of the online videos listed in the Additional Chapter 6 Resources, giving a Lesson 6.4-6.6 Quiz, or reteaching (if needed).</p>	<p>Optional assignment: 6.4 ex14, 6.5 ex10, 6.5 ex12, 6.6 ex10, 6.6 ex12</p>	0.5
	Ch. 6 Review	Chapter 6 Practice Test	Ch. 6 Review Exercises 1-6	1
	Chapter 6 Test	Chapter 6 Test		1

			Ch.6 Review Exercises 1—6	
--	--	--	------------------------------	--

**Unit 7: Estimating a Parameter**

**Enduring Understanding / Big Idea:** A confidence interval is an interval of plausible values for the population parameter.

**Essential Questions:**

- What is a confidence interval?
- What affects the margin of error?
- How can we estimate a population proportion?
- How can we estimate a population mean?

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
-------------------------------	-----------	----------------------	------------	------------------

---

HSS-IC.A.1 HSS-IC.B.4	<b><u>Students will be able to:</u></b>  Interpret a confidence interval in context  Determine the point estimate and margin of error from a confidence interval  Use confidence intervals to make decisions (7.1)	What's the mystery mean?  Do you approve of the president's job performance?	Assignment: 1-13 odd, 19  Entrance ticket  Checkpoint exercises  Partner quiz  Exit ticket	0.5
--------------------------	--	--	--	-----

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
-------------------------------	-----------	----------------------	------------	------------------

HSS-IC.A.1 HSS-IC.B.3 HSS-IC.B.4	<p><b><u>Students will be able to:</u></b></p> <p>Interpret a confidence interval in context</p> <p>Describe how the confidence level and sample size affect the margin of error</p> <p>Explain how practical issues like nonresponse, undercoverage, and response bias can affect the interpretation of a confidence interval (7.2)</p>	<p>Investigating confidence level with the <i>Confidence Intervals</i> applet (<a href="http://www.highschool.bfwpub.com/spa3e">www.highschool.bfwpub.com/spa3e</a> )</p> <p>Exploring margin of error with the <i>Confidence Intervals</i> applet (<a href="http://www.highschool.bfwpub.com/spa3e">www.highschool.bfwpub.com/spa3e</a> )</p> <p>Do you like my photos?</p>	<p>Assignment: 1-15 odd, 19</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5
HSS-IC.A.1 HSS-IC.B.4	<p>Check the Random and Large Counts conditions for constructing a confidence interval for a population proportion</p> <p>Determine the critical value for calculating a C% confidence interval for a population proportion using Table A or technology</p> <p>Calculate a C% confidence interval for a population proportion (7.3)</p>	<p>What proportion of the beads are red?</p> <p>Do you know your government?</p>	<p>Assignment: 1-15 odd, 19</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5

--	--	--	--	--



Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
-------------------------------	-----------	----------------------	------------	------------------

HSS-IC.A.1 HSS-IC.B.4	<p><b><u>Students will be able to:</u></b></p> <p>Use the four-step process to construct and interpret a confidence interval for a population proportion</p> <p>Determine the sample size required to obtain a C% confidence interval for a population proportion with a specified margin of error (7.4)</p>	<p>TV in bed?</p> <p><i>Technology:</i> Confidence Intervals for a Population Proportion using the <i>One Categorical Variable</i> applet at <a href="http://www.highschool.bfwpub.com/spa3e">www.highschool.bfwpub.com/spa3e</a></p>	<p>Assignment: 1-11 odd, 17</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p>	0.5
	<i>Flex Day</i>	<p>Consider giving a quiz on lessons 7.1-7.4, doing an activity from the TRM, or re-teaching (if needed)</p>	<p>Exit ticket</p> <p>Optional assignment: 7.1 ex14, 7.2 ex14, 7.3 ex14, 7.3 ex16, 7.4 ex10</p>	1
	<p>State and check the Random and Normal/Large Sample conditions for constructing a confidence interval for a population mean</p> <p>Determine critical values for calculating a C% confidence interval for a population mean</p> <p>Calculate the C% confidence interval for a population mean (7.5)</p>	<p>Confidence interval BINGO!</p> <p>What does an Oreo weigh?</p>	<p>Assignment: 1, 3, 19 (day 1); 5-15 odd (day 2)</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	1.5

--	--	--	--	--



Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
-------------------------------	-----------	----------------------	------------	------------------

	<p><b><u>Students will be able to:</u></b></p> <p>Use sample data to check the Normal/Large Sample condition</p> <p>Use the four-step process to construct and interpret a confidence interval for a population mean (7.6)</p>	<p>How tense are the video screens?</p> <p><i>Technology:</i> Confidence Intervals for a Population Mean, using the <i>One Quantitative Variable</i> applet at <a href="http://www.highschool.bfwpub.com/spa3e">www.highschool.bfwpub.com/spa3e</a> or a TI-83/84</p>	<p>Assignment: 1-11 odd, 17</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	1
	<i>Flex Day</i>	Use this time to have students work in groups on the <i>STATS applied!</i> at the end of Lesson 7.6. Also consider doing an activity from the TRM, giving quiz on lessons 7.4-7.6, or re-teaching (if needed)	Optional assignment: 7.5 ex14, 7.5 ex 16, 7.6 ex10, 7.6 ex 12	0.5
	Ch. 7 Review	Chapter 7 Practice Test	Ch.7 Review Exercises 1—7	1
	Chapter 7 Test	Chapter 7 Test		1

**Unit 8: Testing a Claim**

**Enduring Understanding / Big Idea:** Tests of significance assess the extent to which sample data support a hypothesis about a population parameter. Not all results of a study are statistically significant. Significance levels are used to assess the strength of a conclusion.

- Essential Questions:**
- What are hypotheses for a significance test?
  - What is the *P*-value of a statistical test?
  - What conditions must be met for a test to be valid?
  - What conclusions can be drawn from a statistical test?

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
-------------------------------	-----------	----------------------	------------	------------------

HSS-IC.B.5 HSS-IC.B.6	<p><b><u>Students will be able to:</u></b></p> <p>State appropriate hypotheses for a significance test about a population parameter</p> <p>Interpret a <math>P</math>-value in context</p> <p>Make an appropriate conclusion for a significance test based on a <math>P</math>-value (8.1)</p>	<p>I'm a great free-throw shooter!</p> <p>Do people kiss the "right" way?</p>	<p>Assignment: 1-15 odd, 19</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5
--------------------------	--	---	---	-----

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
----------------------------	-----------	----------------------	------------	---------------



HSS-CP.B7	<p><b><u>Students will be able to:</u></b></p> <p>Determine if the results of a study are statistically significant and make an appropriate conclusion using a significance level</p> <p>Interpret a Type I error and a Type II error in context</p> <p>Give a consequence of a Type I error and a Type II error in a given setting (8.2)</p>	Are these potatoes keepers?	<p>Assignment: 1-17 odd, 21</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5
HSS-CP.B7	<p>Check the Random and Large Counts conditions for performing a significance test about a population proportion</p> <p>Calculate the standardized test statistic for a significance test about a population proportion</p> <p>Find the a <math>P</math>-value for a one-sided significance test about a population proportion using Table A or technology (8.3)</p>	Is it better to be last?	<p>Assignment: 1-15 odd, 19</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5

--	--	--	--	--

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
-------------------------------	-----------	----------------------	------------	---------------

HSS-CP.B7	<p><b>Students will be able to:</b></p> <p>Use the four-step process to perform a one-sided significance test about a population proportion (8.4)</p>	<p><i>Technology:</i> One-sample z test for a proportion, using the <i>One Categorical Variable</i> applet at <a href="http://www.highschool.bfwpub.com/spa3e">www.highschool.bfwpub.com/spa3e</a> or a TI-83/84</p>	Assignment: 1, 3, 21	0.5
HSS-CP.B7	<p>Calculate the <math>P</math>-value for a two-sided significance test about a population proportion using Table A or technology</p> <p>Use the four-step process to perform a two-sided significance test about a population proportion (8.4)</p>	Who feels job stress?	<p>Assignment: 5-9 odd, 15, 17</p> <p>Entrance ticket</p> <p>Checkpoint exs.</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5
	<i>Flex Day</i>	<p><i>Consider giving Quiz 8A: Lessons 8.1-8.4, doing an activity from the Teachers Resource Materials, or re-teaching (if needed).</i></p>	<p>Optional assignment:</p> <p>8.1 Ex14, 16</p> <p>8.2 Ex14</p> <p>8.3 Ex14</p> <p>8.4 Ex 14</p>	0.5

--	--	--	--	--

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
-------------------------------	-----------	----------------------	------------	---------------

HSS-CP.B7	<p><b><u>Students will be able to:</u></b></p> <p>Check the Random and Normal/Large Sample conditions for performing a significance test about a population mean</p> <p>Calculate the standardized test statistic for a significance test about a population mean</p> <p>Find the a <math>P</math>-value for a significance test about a population mean using Table B (8.5)</p>	Who needs an aspirin?	<p>Assignment: 1-17 odd</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5
HSS-CP.B7	Use the four-step process to perform a significance test about a population mean(8.6)	<p><i>Technology:</i> One-Sample t-test for a Mean, using the <i>One Quantitative Variable</i> applet at <a href="http://www.highschool.bfwpub.com/spa3e">www.highschool.bfwpub.com/spa3e</a> or a TI-83/84</p>	<p>Assignment: 1-5 odd, 19</p> <p>Exit ticket</p>	0.5
HSS-CP.B7	Use a confidence interval to draw a conclusion about a two-sided test for a population mean (8.6)	Do our employees have high blood pressure?	<p>Assignment: 7-13 odd</p> <p>Exit ticket</p>	0.5

--	--	--	--	--



Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
-------------------------------	-----------	----------------------	------------	---------------

	<b><u>Students will be able to:</u></b>			
	<i>Flex Day</i>	<i>Have students work in groups on the STATS applied! at the end of Lesson 8.6. Also consider doing an activity from the TRM, giving Quiz 8B: Lessons 8.5-8.6, or re-teaching (if needed)</i>		0.5
	Ch. 8 Review	Chapter 8 Practice Test	Ch.8 Review Exercises 1—7	1
	Chapter 8 Test	Chapter 8 Test		1

**Unit 9: Comparing Two Populations or Treatments**

**Enduring Understanding / Big Idea:** Inferential statistics involves methods of using information from a sample to draw conclusions regarding the population. Significance tests can be used to compare two populations. Significance levels are used to assess the strength of a conclusion.

**Essential Questions:** Which significance test is appropriate for a given situation?  
Why do we do significance tests?

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
-------------------------------	-----------	----------------------	------------	------------------

<p>HSS-ID.A2 HSS-ID.A3</p>	<p><b><u>Students will be able to:</u></b></p> <p>Describe the shape, center, and variability of the sampling distribution of a difference between two sample proportions</p> <p>Check the Random and Large Counts conditions for constructing a confidence interval for a difference between two proportions</p> <p>Use the four-step process to construct and interpret a confidence interval for the difference between two proportions (9.1)</p> <p>Identify how the parts of the equations shape the graph of the parabola (width, shift of vertex etc.) (9.1)</p>	<p>Who likes rap music more?</p> <p><i>Technology:</i> Confidence Intervals for a Difference Between Two Proportions using the <i>One Categorical Variable</i> applet at <a href="http://www.highschool.bfwpub.com/spa3e">www.highschool.bfwpub.com/spa3e</a> or a TI-83/84</p>	<p>Assignment: 1-15 odd, 19</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	<p>1</p>
--------------------------------	---	---	---	----------

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
-------------------------------	-----------	----------------------	------------	---------------

HSS-CP.B7	<p><b><u>Students will be able to:</u></b></p> <p>State hypotheses and check conditions for performing a significance test about a difference between two proportions</p> <p>Calculate the standardized test statistic and <math>P</math>-value for a significance test about a difference between two proportions (9.2)</p>	<p>Does taking aspirin help prevent heart attacks?</p> <p><i>Technology:</i> Significance Tests for a Difference Between Two Proportions, using the <i>One Categorical Variable</i> applet at <a href="http://www.highschool.bfwpub.com/spa3e">www.highschool.bfwpub.com/spa3e</a> or a TI 83/84</p>	<p>Assignment: 1-7 odd, 17, 19</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5
HSS-CP.B7	<p>Use the four-step process to perform a significance test about a difference between two proportions (9.2)</p>		<p>Assignment: 9-15 odd</p> <p>Exit ticket</p>	0.5
	<i>Flex Day</i>	<p><i>Consider giving Quiz 9A: Lessons 9.1-9.2, doing an activity from the TRM, or re-teaching (if needed)</i></p>	<p>Optional assignment: 9.1 Ex14, 16 9.2 Ex14, 16</p>	0.5

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
-------------------------------	-----------	----------------------	------------	---------------

HSS-ID.A2 HSS-ID.A3 HSS-ID.B5	<p><b><u>Students will be able to:</u></b></p> <p>Describe the shape, center, and variability of the sampling distribution of a difference between two sample means</p> <p>Check the Random and Normal/Large sample conditions for constructing a confidence interval for a difference between two means</p> <p>Use the four-step process to construct and interpret a confidence interval for the difference between two means (9.3)</p>	<p>Do bigger apartments cost more money?</p> <p><i>Technology:</i> Confidence Intervals for a Difference Between Two Means, using the <i>One Quantitative Variable</i> applet at <a href="http://www.highschool.bfwpub.com/spa3e">www.highschool.bfwpub.com/spa3e</a> or a TI 83/84</p>	<p>Assignment: 1-15 odd, 19</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	<p>1</p>
HSS-CP.B7	<p>State hypotheses and check conditions for performing a significance test about a difference between two means</p> <p>Calculate the standardized test statistic and <math>P</math>-value for a significance test about a difference between two means (9.4)</p>	<p><i>Technology:</i> Significance Tests for a Difference Between Two Means, using the <i>One Quantitative Variable</i> applet at <a href="http://www.highschool.bfwpub.com/spa3e">www.highschool.bfwpub.com/spa3e</a> or a TI-83/84</p>	<p>Assignment: 1-7 odd, 17, 21</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	<p>1</p>



--	--	--	--	--

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
-------------------------------	-----------	----------------------	------------	---------------

HSS-CP.B7	<p><b><u>Students will be able to:</u></b></p> <p>Use a graph to analyze the distribution of differences in a paired data set</p> <p>Calculate the mean and s.d. of the differences in a paired data set and interpret the mean difference in context</p> <p>Use the four-step process to construct and interpret a confidence interval for the true mean difference (9.5)</p>	Is caffeine dependence real?	<p>Assignment: 1-17 odd</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	1
HSS-CP.B7	<p>Use the four-step process to perform a significance test about a mean difference</p> <p>Determine whether you should use two-sample <math>t</math>-procedures for inference about <math>\mu_1 - \mu_2</math> or one-sample <math>t</math>-procedures for inference about <math>\mu_{diff}</math> in a given setting (9.6)</p>	<p>Get your heart rate beating!</p> <p>Does generic ice cream melt faster?</p>	<p>Assignment: 1-13 odd, 17</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	1

--	--	--	--	--

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
	<u>Students will be able to:</u>  <i>Flex Day</i>	<i>Have students work in groups on the STATS applied! at the end of Lesson 9.6. Also consider giving Quiz 9C: Lessons 9.5-9.6, or re-teaching (if needed)</i>	<i>Optional assignment: 9.5 Ex 14 9.6 Ex 12, 14</i>	0.5
	Ch. 9 Review	Ch. 9 Practice Test	Ch. 9 Review Exercises 1-7	1
	Ch. 9 Test	Ch. 9 Test		1

--	--	--	--	--

**Unit 10: Inference for Distributions and Relationships**

**Enduring Understanding / Big Idea:**

Inferential statistics involves methods of using information from a sample to draw conclusions regarding the population.

Inference is based on chance. The purpose of a “goodness of fit” test is to decide if the sample results are consistent with results that would have been obtained if a random sample had been selected from a population with a known distribution.

**Essential Questions:**      How can the relationship between two categorical variables be assessed?  
How can the relationship between two quantitative variables be assessed?

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
-------------------------------	-----------	----------------------	------------	------------------

<p>HSS-MD.A.1 HSS-MD.B.1</p>	<p><b><u>Students will be able to:</u></b></p> <p>State hypotheses for a test about the distribution of a categorical variable</p> <p>Calculate expected counts for a test about the distribution of a categorical variable</p> <p>Calculate the test statistic for a test about the distribution of a categorical variable (10.1)</p> <p>Apply the Pythagorean Theorem to find missing side lengths of right triangles (10.1)</p>	<p>The Color of Candy (day 1)</p> <p>Are fruit flies predictable? (day 2)</p>	<p>Assignment: 1-15 odd, 19 (day 2)</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	<p>1</p>
----------------------------------	--	---	---	----------



Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
-------------------------------	-----------	----------------------	------------	------------------

HSS-CP.B7	<p><b><u>Students will be able to:</u></b></p> <p>Check the conditions for a test about the distribution of a categorical variable</p> <p>Calculate the <math>P</math>-value for a test about the distribution of a categorical variable</p> <p>Use the four-step process to perform a chi-square test for goodness of fit (10.2)</p>	<p>Is this die fair?</p> <p><i>Technology:</i> Chi-Square Test for Goodness of Fit, using the <i>One Categorical Variable</i> applet at <a href="http://www.highschool.bfwpub.com/spa3e">www.highschool.bfwpub.com/spa3e</a> or a TI-84 (note: this test isn't available on the TI-83 and some color models of TI-84s)</p>	<p>Assignment: 1-15 odd, 19</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	1
	<i>Flex Day</i>	<i>Consider giving quiz10A: Lessons 10.1-10.2, doing an activity from the TRM, or re-teaching (if needed)</i>	<i>Optional assignment: 10.1 Ex14, 16 10.2 Ex 14, 16</i>	0.5
HSS-CP.B7	<p>State hypotheses for a test about the relationship between two categorical variables</p> <p>Calculate expected counts for a test about the relationship between two categorical variables</p> <p>Calculate the test statistic for a test about the relationship between two categorical variables (10.3)</p>	<p>Is there an association between gender and superpower preference?</p>	<p>Assignment: 1-13 odd, 19</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	1



Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
-------------------------------	-----------	----------------------	------------	------------------

HSS-CP.B7	<p><b><u>Students will be able to:</u></b></p> <p>Check conditions for a test about the relationship between two categorical variables</p> <p>Calculate the <math>P</math>-value for a test about the relationship between two categorical variables</p> <p>Use the four-step process to perform a chi-square test for association (10.4)</p>	<p>Should angry people go to the sauna?</p> <p><i>Technology:</i> Chi-Square Test for Association, using the <i>Two Categorical Variables</i> applet at <a href="http://www.highschool.bfwpub.com/spa3e">www.highschool.bfwpub.com/spa3e</a> or a TI-83/84</p>	<p>Assignment: 1-15 odd, 19</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5
	<i>Flex Day</i>	<p><i>Consider giving quiz10B: Lessons 10.3-10.4, doing an activity from the TRM, or re-teaching (if needed)</i></p>	<p><i>Optional assignment:</i> 10.3 Ex 14 10.4 Ex 14, 16</p>	0.5
HSS-CP.B7	<p>State hypotheses for a test about the relationship between two quantitative variables (10.5)</p>	<p>Should you sit in front?</p>	<p>Assignment: 1, 3, 19</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5

--	--	--	--	--

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
-------------------------------	-----------	----------------------	------------	------------------

HSS-CP.B7	<p><b><u>Students will be able to:</u></b></p> <p>Calculate expected counts for a test about the relationship between two quantitative variables</p> <p>Calculate the test statistic and P-value for a test about the relationship between two quantitative variables given summary statistics (10.5)</p>	Do beavers benefit beetles?	<p>Assignment: 5-13 odd</p> <p>Entrance ticket</p> <p>Checkpoint exercises</p> <p>Partner quiz</p> <p>Exit ticket</p>	0.5
HSS-CP.B7	<p>Use technology to calculate the test statistic and <i>P</i>-value for a test about the relationship between two quantitative variables</p> <p>Use the four-step process to perform a test for the slope of a least-squares regression line (10.6)</p> <p>Use the four-step process to calculate and interpret a confidence interval for the slope of a least squares regression line (10.6)</p>	<p><i>Technology:</i> t Test for the Slope of a Least-Squares Regression Line, using the <i>Two Quantitative Variables</i> applet at <a href="http://www.highschool.bfwpub.com/spa3e">www.highschool.bfwpub.com/spa3e</a> or a TI-83/84</p> <p>How fit can you get?</p>	<p>Assignment: 1-7 odd, 19</p> <p>Assignment: 9-15 odd</p>	<b>OPTIONAL (IF TIME ALLOWS)</b>



--	--	--	--	--

Common Core State Standard	Objective	Suggested Activities	Assessment	Pacing (days)
	<u>Students will be able to:</u>  <i>Flex Day</i>	Have students work in groups on the STATS applied! at the end of lesson 10.6. Also consider giving quiz 10B: Lessons 10.5-10.6 or re-teaching (if needed)	Optional assignment: 10.5 Ex 14 10.6 Ex 14, 16	0.5
	Ch. 10 Review	Ch. 10 Practice Test	Ch. 9 Review Exercises 1-5	1
	Ch. 10 Test	Ch. 10 Test		1

## **Unit 11: Culminating Project - 5 DAYS**

### **Probability and Statistics Final Project**

**The projects are due on \_\_\_\_\_**

**Purpose:** This project is to be culmination of a year's work. It will incorporate all that you have learned: designing an experiment, exploratory data analysis, constructing confidence intervals, and hypothesis testing. In addition, it will require learning some technological skills and practicing your presentation ones.

**Group size:** Groups can be either one, two or three people, based on how many people are really necessary for your topic. For example, if you are analyzing how people react in traffic, you will certainly need 2 people – one to watch cars and motorists and the other to write the information down. It is rare that projects need 3 students and many can be done with one. **YOUR TEACHER WILL DECIDE THE MAXIMUM NUMBER OF PEOPLE IN THE GROUP ONCE THE PROJECT TOPIC IS CHOSEN.**

**Time:** During the last several weeks of the school year you will be expected to use class time to collect data and work on your report and presentation. Failure to use class time productively will result in a lower grade.

**The projects are due on \_\_\_\_\_**

**Question:** The first task of your group is to decide on a question to investigate. Part of answering the question must involve constructing confidence intervals and hypothesis testing. **You must have permission by your teacher for any project.**

**Data:** You may collect your data via a student survey. You may not enter a classroom to distribute surveys. If an experiment is quite complex, you may work in groups of three **but you must have permission before doing so.**

## Project Grading Guidelines

I will be looking for the following characteristics:

1. **Consistency:** Did you answer your question of interest?
2. **Clarity:** Is it easy for your reader to understand what you did and the arguments you made?
3. **Relevancy:** Did you use statistical techniques wisely to address your question?
4. **Interest:** Did you tackle a challenging, interesting question (good), or did you just collect descriptive statistics (bad)?

Some suggestions for scoring high on these criteria and suggestions you should keep in mind when writing are the following:

1. Know your audience. In this case, you should design the project for an audience of your peers. You may want to have your classmates examine your project for clarity.
2. State your question up front, and use statistics to help answer it. The statistics should not drive the question; the question should drive the statistics.
3. Have a specific question in mind before collecting data. If not, you wind up being hard-pressed to come up with something challenging and interesting.
4. Be selective with computer output to help clarity.

If you are using techniques we learned in class, you do not have to re-explain the techniques. That hurts clarity. If you are using techniques that we did not cover in class, you should definitely explain the techniques. That is clarity!

## Guidelines for Creating an Effective Project

An effective project communicates your purpose in a clear and concise fashion. The project should address the following six points:

1. **Statement of the problem (5% of total grade):**  
Provide a description of your topic and how you found your data using 3-5 sentences.  
Also, describe any key issues surrounding your topic.
2. **Data collection (10% of total grade):**  
Explain how you collected the data. Include any questions you asked. Also, include response rates and raw data.  
You must provide ALL of your sample data based on the topic you chose.
3. **Analyses (45% of total grade):**

Describe the analyses you did. Be ready to explain why you believe these methods are justified.

You must answer the following:

- a. List the sample size and determine the mean and standard deviation.
- b. Determine the margin of error for the 80%, 95% and 99% confidence levels.
- c. Find the 80%, 95% and 99% confidence intervals for the population mean/proportion of success, variance, and standard deviation.
- d. Test your claims at the 10%, 5% and 1% significance levels (Hypothesis Testing).

4. **Results (10% of total grade):**

Present relevant descriptive statistics (e.g., number of men and women surveyed, if that is important). Include tables or graphs that support your analyses (be judicious here--too many tables and graphs hurts the clarity of your message).

5. **Discussion (20% of total grade):**

Each student/group must write a FULL half page reflection. The reflection should include the following:

- a. What implications do your results have for the population you sampled from?
- b. What could be done to improve the study if it was done again?
- c. What types of biases might exist?
- d. Explain how this project is relevant to something you have experienced or seen in the real world.

6. **Presentation (10% of total grade):**

**Presentations should be brief and to the point, 5-10 minutes maximum.**

You could present your project using a Power-Point file or a poster board. You should strive to make the presentation clear. Avoid unnecessary clutter, and don't put too much information on any one page. Think about what you would want to see on other people's presentation as guidance for creating your Power-Point file or poster.

**Procedures For When Group Members Are Not Contributing Their Fair Share**

Each group should spread the work among members so that everyone shares in the project. If some group members do not contribute their assigned workload, or are unwilling to take on work, your group may petition to have such group members dropped from the group. The process of this petition proceeds as follows:

- 1) Send an e-mail to the instructor explaining how the group members have not contributed adequately. **ALL MEMBERS OF THE GROUP MUST BE SENT THIS E-MAIL.** This is to ensure that everything is done openly.
- 2) The instructor will arrange a meeting with the group. Subjects of a petition who fail to attend the arranged meeting will be dropped from the group.
- 3) At this meeting, the instructor will make a decision on the petition.

These petitions can be made until the first week of June. After this date, groups will not be split up. Students who have been dropped from groups must find another group or get special permission to work alone from the instructor. After one of these meetings, any group member who does not contribute after promising to do so will be dropped from the group.

### **Examples of Data Collection Projects:**

A study to determine which brand of cookie has a higher mean number of chips per cookie: Chips Ahoy or Famous Amos. This type of project can be used in many types of foods or other articles.

Does the number of French Fries in a large container versus a small container justify the higher cost?

Does age affect people's ability to answer questions?

A study comparing the difference between the proportion of men in advertisements in women's magazines and the proportion of women in advertisements in a men's magazine

Do boys or girls have better hearing (coordinated with school nurse)?

Does higher cost in foods mean better taste?

Does taking a test with questions from easiest to hardest, hardest to easiest, and in random order make a difference?

Does a yellow light mean that drivers stop or speed up through an intersection?

A study of whether there was a greater proportion of complaint letters to the editor in Time Magazine during the first half or the second half of the year 2002

Clinton speeches vs. Bush speeches - is there a difference in the proportion of longer words in each.

Do men tend to make purchases more frequently than women when shopping?

Does gender make a difference in whether a person stops or goes through a yellow light?

Does a bug zapper really attract bugs?

Examine the ratio of content pages to ad pages in different genre of magazines and see if there is a relationship.

Are Boys More Generous Than Girls?

Which Language Uses A Higher Proportion of Vowels?

The Proportion of Advertisements Containing Websites in Sports Illustrated and Newsweek

Do men or women have larger handwriting?

A Study Comparing the Soft Drink Preferences of Men and Women

A study of the price of a single scoop of vanilla ice cream (or other foods) from many stores

Is there a bias towards any digit on the serial number of money?

How far do rubber bands stretch before they break?

Are self-checkouts actually faster?

Weights of full backpacks for RHS students - does gender, grade, height of student, race, etc. make a difference?

A study of gasoline prices - does having several gas stations in close proximity keep the price lower?

Door widths of local businesses that should be wheelchair accessible.

Is there a relationship between the size of a font and the amount of space a paragraph takes on a page?

Sports teams who have higher salaries win more championships. Is this generally true?

Bake cupcakes with different color icing. Does the color make a difference when people select them? You can do this many ways with many types of foods - shapes of glasses, shape of product, etc.

Tap water versus bottled.

### **Questionnaire Survey type projects:**

Which gender tends to wear jeans more, men or women?

How far will people travel to save 5 cents a gallon on gas - is there a difference between the sexes?

A study comparing the proportion of young adults, middle age people, and senior citizens and teenagers who claim to have a strong belief in God.

In what ways does exercise help a person? How strong are these impacts? (Example: Does someone who regularly exercises and then stops feel more depressed than someone who never exercises? How much happier is a person after they start exercising? Does it matter what kind of exercise? How long do these impacts last?)

A study to determine which gender follows the rules of the road more often by comparing the proportion of men and women who fully stop when making a turn on red as opposed to not making a full stop.

Is there a relationship between the number of colleges a student applied to and his or her GPA?

Do glasses make people look smart? Are people more inclined to respect a person with glasses?

Do certain accents (Russian, English, southern) carry with them certain connotations? For example, might a person think someone is smarter simply because they have an English accent, and think the person less bright if they have a southern accent?

Is there a relationship between the colors people wear and the color of their car?

Does taking vitamin C have an impact on colds?

Do people tend to enter into professions that are like what their parents did? How much is this tendency, if there is one, affected by the quality of their relationship with their parents? And which has more affect - the father's relationship, the mother's, or does it depend on the quality of the parent-child relationship, or perhaps on the match of personality?

Does working have an impact on how much one spends on popcorn and such at a movie?

Does the wording of a survey actually make a difference in the results?



The government should allow... as opposed to the government should forbid ...

Conjecture: there is a relationship between a student's GPA and the cost of the college they are going to?

## RESOURCES

- Statistics and Probability with Applications, 3<sup>rd</sup> Edition, bfw publishers
- [www.highschool.bfwpub.com/spa3e](http://www.highschool.bfwpub.com/spa3e)
- [https://onlinestatbook.com/stat\\_sim/sampling\\_dist](https://onlinestatbook.com/stat_sim/sampling_dist)
- [www.rossmanchance.com/applets](http://www.rossmanchance.com/applets)
- [www.youcubed.org](http://www.youcubed.org)
- [www.corestandards.org](http://www.corestandards.org)