

**HILLSBOROUGH TOWNSHIP HIGH SCHOOL**

**MATHEMATICS CURRICULUM**

**College Preparatory Statistics**

**July, 2020**

## **Course Overview**

### **College Preparatory Statistics**

This senior level course is designed as a fifth year mathematics course. This course is structured using the New Jersey Student Learning Standards for Mathematics. Content to be taught includes but is not limited to exploring and understanding data, exploring relationships between variables, gathering data and randomness and probability. The New Jersey Student Learning Standards for Mathematical Practice: make sense of problems and persevere in solving them; reason abstractly and quantitatively; construct viable arguments and critique the reasoning of others; model with mathematics; use appropriate tools strategically; attend to precision; look for and make use of structure; and look for and express regularity in repeated reasoning are embedded in the daily teaching and learning.

A variety of tools and strategies will be incorporated into the instruction of the curriculum to enhance the learning of every child. Such digital tools include calculators and web based sites as appropriate. Cross-curricular connections are made to help students see how mathematics concepts are applied in other content areas and in everyday life.

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<b>Unit Title:</b> Unit 1 Exploring and Understanding Data	<b>Time Frame/Pacing:</b> 50 days
<b>Essential Questions</b> <ul style="list-style-type: none"><li>● What is categorical data?</li><li>● What is quantitative data?</li><li>● How can data be organized and displayed to help with decision making?</li><li>● How are diverse groups that normally have nothing in common compared?</li></ul>	
<b>Enduring Understandings</b> <ul style="list-style-type: none"><li>● It is important to classify data as categorical or quantitative to know how to use it in decision making.</li></ul>	
<b>Standards Taught and Assessed</b> <ul style="list-style-type: none"><li>● <b>S.ID.B5</b> Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.</li><li>● <b>S.ID.A1</b> Represent data with plots on the real number line (dot plots, histograms, and box plots).</li><li>● <b>S.ID.A2</b> Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.</li><li>● <b>S.ID.A3</b> Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).</li><li>● <b>S.ID.A4</b> Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.</li></ul>	
<b>Highlighted Interdisciplinary Connections</b> <ul style="list-style-type: none"><li>● <b>NJSLSA.W4</b> Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</li><li>● <b>NJSLSA.W5</b> Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.</li><li>● <b>NJSLSA.W6</b> Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.</li></ul>	
<b>Highlighted Career Ready Practices and 21st Century Themes and Skill</b> <ul style="list-style-type: none"><li>● <b>9.4.2.IML.2</b> Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10).</li><li>● <b>9.4.2.IML.3</b> Use a variety of sources including multimedia sources to find information about topics such as climate change, with guidance and support from adults (e.g., 6.3.2.GeoGI.2, 6.1.2.HistorySE.3, W.2.6, 1-LSI-2).</li></ul>	

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<p><b>Social Emotional Learning Competencies</b></p> <ul style="list-style-type: none"> <li>● <b>CHPE. 2.1.12.EH.1</b> Recognize one’s personal traits, strengths, and limitations and identify how to develop skills to support a healthy lifestyle.</li> </ul>				
<p><b>Pre-Assessment</b></p> <ul style="list-style-type: none"> <li>● <b>S.ID.A1, S.ID.B5</b></li> </ul>		<p><b>Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)</b></p> <ul style="list-style-type: none"> <li>● As per student’s IEP’s and 504’s, for example: extra time, provide a copy of the notes.</li> </ul>		
<p><b>Student Learning Objectives: We are learning to/that...</b></p>	<p><b>Student Strategies (Mathematical Practices)</b></p>	<p><b>Formative Assessment</b></p>	<p><b>Activities and Resources</b></p>	<p><b>Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)</b></p>
<p><b>S.ID.B5</b> Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.</p>	<p>SMP 4 Model with mathematics.</p>	<p>Students start to understand the importance of statistics and data. Students learn to summarize categorical data and display the data in a chart.</p>	<p>Create a poll and represent the results using a frequency table and graph. Explain the results and any inferences that can be made.</p>	<p>As per student’s IEP’s and 504’s, for example: extra time, provide a copy of the notes, provide a copy of the text to read in class.</p>
<p><b>S.ID.A1</b> Represent data with plots on the real number line (dot plots, histograms, and box plots).</p>	<p>SMP 4 Model with mathematics.</p>	<p>Students learn to display quantitative data and interpret the graphs using the terms, shape, center, spread, and any unusual features.</p>	<p>Collect the heights of all the students in the class. Separate the data based on gender. Create a box-and-whisker plot &amp; a histogram. Describe observations in the data.</p>	<p>As per student’s IEP’s and 504’s, for example: extra time, provide a copy of the notes, provide a copy of the text to read in class.</p>

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<p><b>S.ID.A2</b> Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.</p>	<p>SMP 4 Model with mathematics.</p>	<p>Students learn to standardize the data using the standard deviation as a ruler.</p>	<p>Compare the results of the performance of two different types of athletes by using their z-score compared to other top athletes in their sport. Who is the better athlete based on the calculation?</p>	<p>As per student's IEP's and 504's, for example: extra time, provide a copy of the notes, provide a copy of the text to read in class.</p>
<p><b>S.ID.A3</b> Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).</p>	<p>SMP7 Look for and make use of structure.</p>	<p>Students learn to describe quantitative data in various ways, including graphs and charts and numerical ways to describe these distributions including the 5-number summary, measures of the center, and measures of the spread. They also learn boxplots to compare groups.</p>	<p>Select a data set from a sports team, environmental agency, etc and analyze the data. What observations or conclusions can be made based on the data?</p>	<p>As per student's IEP's and 504's, for example: extra time, provide a copy of the notes, provide a copy of the text to read in class.</p>
<p><b>S.ID.A4</b> Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.</p>	<p>SMP6. Attend to precision.</p>	<p>Use the Normal model to understand data.</p>	<p>Students will be presented with a normal data set. They will be able to calculate the percentiles and probabilities from data points using a z-score table.</p>	<p>As per student's IEP's and 504's, for example: extra time, provide a copy of the notes, provide a copy of the text to read in class.</p>

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<b>Benchmark Assessment</b> <ul style="list-style-type: none"><li>● Not applicable</li></ul>	<b>Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)</b> <ul style="list-style-type: none"><li>● As per student's IEP's and 504's, for example: extra time, use of a calculator.</li></ul>
<b>Summative Assessment(s)</b> <ul style="list-style-type: none"><li>● Common Assessment 1- S.ID.B5, S.ID.A1</li><li>● Common Assessment 2 - S.ID.B5</li><li>● Common Assessment 3 - S.ID.A2</li><li>● Common Assessment 4 - S.ID.A3</li><li>● Common Assessment 5 - S.ID.A4</li><li>● Performance Tasks- Chapters 1-5 (one per chapter)</li></ul>	

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<b>Unit Title:</b> Unit 2 Exploring Relationships Between Data Variables	<b>Time Frame/Pacing:</b> 30 days
<p><b>Essential Questions</b></p> <ul style="list-style-type: none"> <li>● Is there a relationship between two quantitative variables?</li> <li>● Is there a linear relationship between two quantitative variables and can this relationship be modeled?</li> <li>● Can we express non-linear data using functions and why would we do this?</li> </ul>	
<p><b>Enduring Understandings</b></p> <ul style="list-style-type: none"> <li>● Understand that correlation measures the strength of the association between two quantitative variables.</li> </ul>	
<p><b>Standards Taught and Assessed</b></p> <ul style="list-style-type: none"> <li>● <b>S.ID.B6.a</b> Fit a function to the data (including with the use of technology); use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear and exponential models.</li> <li>● <b>S.ID.B6.c</b> Fit a linear function for a scatter plot that suggests a linear association.</li> <li>● <b>S.ID.B7</b> Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.</li> <li>● <b>S.ID.B8</b> Compute (using technology) and interpret the correlation coefficient of a linear fit.</li> </ul>	
<p><b>Highlighted Interdisciplinary Connections</b></p> <ul style="list-style-type: none"> <li>● <b>NJSLSA.W4</b> Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</li> <li>● <b>NJSLSA.W5</b> Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.</li> <li>● <b>NJSLSA.W6</b> Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.</li> </ul>	
<p><b>Highlighted Career Ready Practices and 21st Century Themes and Skill</b></p> <ul style="list-style-type: none"> <li>● <b>9.4.2.IML.2</b> Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10).</li> <li>● <b>9.4.2.IML.3</b> Use a variety of sources including multimedia sources to find information about topics such as climate change, with guidance and support from adults (e.g., 6.3.2.GeoGI.2, 6.1.2.HistorySE.3, W.2.6, 1-LSI-2).</li> </ul>	
<p><b>Social Emotional Learning Competencies</b></p> <ul style="list-style-type: none"> <li>● <b>CHPE. 2.1.12.EH.1</b> Recognize one's personal traits, strengths, and limitations and identify how to develop skills to support a healthy lifestyle.</li> </ul>	
<b>Pre-Assessment</b>	<b>Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of</b>

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<ul style="list-style-type: none"> <li>• <b>S.ID.B6.a, S.ID.B6.c</b></li> </ul>		<b>Failure, 504)</b> <ul style="list-style-type: none"> <li>• Extended time, use of calculator, challenge work and specific other accommodations/modifications per a student's IEP or 504 plan.</li> </ul>		
<b>Student Learning Objectives: We are learning to/that...</b>	<b>Student Strategies (Mathematical Practices)</b>	<b>Formative Assessment</b>	<b>Activities and Resources</b>	<b>Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)</b>
<b>S.ID.B6.a</b> Fit a function to the data (including with the use of technology); use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear and exponential models.	SMP 4 Model with mathematics.	Students learn to use re-expression to make a non-linear scatterplot "more" linear. They then use the regression model to make assumptions about the original non-linear relationship.	Students will model and look for a correlation between two variables. Students will generate their own surveys to gather the data from peers.	As per student's IEP's and 504's, for example: extra time, provide a copy of the notes, provide a copy of the text to read in class.
<b>S.ID.B6.c</b> Fit a linear function for a scatter plot that suggests a linear association.	SMP 7 Look for and make use of structure.	Students learn to make scatterplots. They decide if there is an association between two variables and is there evidence of a cause-and-effect relationship.	Students will model and look for a correlation between two variables. Students will generate their own surveys to gather the data from peers.	As per student's IEP's and 504's, for example: extra time, provide a copy of the notes, provide a copy of the text to read in class.
<b>S.ID.B7</b> Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the	SMP 7 Look for and make use of structure.	Students will use regression lines to make predictions about future values. They will use the	Students will use a data set from the math text to plot and find the line of best fit by hand. They will compute the	As per student's IEP's and 504's, for example: extra time, provide a copy of the notes,



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context of the data.		correlation coefficient to decide how reliable the models are in making predictions.	slope and y-intercept, then interpret its meaning in terms of the model.	provide a copy of the text to read in class.
<b>S.ID.B8</b> Compute (using technology) and interpret the correlation coefficient of a linear fit.	SMP 6 Attend to precision.	Students learn that when the requirements are met we can model the relationship between two variables with a least square regression line.	Students will use the data sets in the text software to create scatter plots in Google Sheets & Statcrunch. They will then use the software to calculate the correlation coefficient.	As per student's IEP's and 504's, for example: extra time, provide a copy of the notes, provide a copy of the text to read in class.
<b>Benchmark Assessment</b> <ul style="list-style-type: none"> <li>Not applicable</li> </ul>		<b>Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)</b> <ul style="list-style-type: none"> <li>As per student's IEP's and 504's, for example: extra time, use of a calculator.</li> </ul>		
<b>Summative Assessment(s)</b> <ul style="list-style-type: none"> <li>Common Assessment 6 - S.ID.B6.a</li> <li>Common Assessment 7 - S.ID.B6.c, S.ID.B7</li> <li>Common Assessment 8 - S.ID.B8</li> <li>Performance Tasks- Chapters 6-8 (one per chapter)</li> </ul>				

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<b>Unit Title:</b> Unit 3- Gathering Data	<b>Time Frame/Pacing:</b> 30 days
<b>Essential Questions</b> <ul style="list-style-type: none"><li>● What are samples?</li><li>● How do we collect data?</li><li>● How do we avoid bias?</li><li>● How and why do we conduct randomized comparative experiments?</li></ul>	
<b>Enduring Understandings</b> <ul style="list-style-type: none"><li>● Collecting samples which best summarize the population that needs to be studied and understood to ensure that the conclusions are skewed.</li></ul>	
<b>Standards Taught and Assessed</b> <ul style="list-style-type: none"><li>● <b>S-IC-A.1</b> Understand statistics as a process for making inferences about population parameters based on a random sample from that population.</li><li>● <b>S-IC-B.3</b> Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.</li><li>● <b>S-IC-B.5</b> Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.</li></ul>	
<b>Highlighted Interdisciplinary Connections</b> <ul style="list-style-type: none"><li>● <b>NJSLSA.W4</b> Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</li><li>● <b>NJSLSA.W5</b> Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.</li><li>● <b>NJSLSA.W6</b> Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.</li></ul>	
<b>Highlighted Career Ready Practices and 21st Century Themes and Skill</b> <ul style="list-style-type: none"><li>● <b>9.4.2.IML.2</b> Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10).</li><li>● <b>9.4.2.IML.3</b> Use a variety of sources including multimedia sources to find information about topics such as climate change, with guidance and support from adults (e.g., 6.3.2.GeoGI.2, 6.1.2.HistorySE.3, W.2.6, 1-LSI-2).</li></ul>	

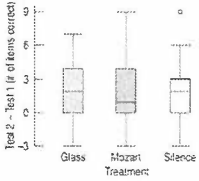
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<p><b>Social Emotional Learning Competencies</b></p> <ul style="list-style-type: none"> <li>● <b>CHPE. 2.1.12.EH.1</b> Recognize one’s personal traits, strengths, and limitations and identify how to develop skills to support a healthy lifestyle.</li> </ul>				
<p><b>Pre-Assessment</b></p> <ul style="list-style-type: none"> <li>● <b>S-IC-B.3</b></li> </ul>		<p><b>Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)</b></p> <ul style="list-style-type: none"> <li>● Extended time, use of calculator, challenge work and specific other accommodations/modifications per a student’s IEP or 504 plan.</li> </ul>		
<p><b>Student Learning Objectives: We are learning to/that...</b></p>	<p><b>Student Strategies (Mathematical Practices)</b></p>	<p><b>Formative Assessment</b></p>	<p><b>Activities and Resources</b></p>	<p><b>Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)</b></p>
<p><b>S-IC-A.1</b> Understand statistics as a process for making inferences about population parameters based on a random sample from that population.</p>	<p>SMP 8- Look for and express regularity in repeated reasoning.</p>	<p>Students will pose a question and design their own survey. Students will decide what type of sampling is needed to gather the best data to answer the question posed.</p>	<p>Text Exercise: Consider each situation. Does the proposed sampling method used seem appropriate? A) We want to know if there is neighborhood support to turn a vacant lot into a playground. We spend a Saturday afternoon going door-to-door in a neighborhood, asking people to sign a petition. B) We want to know if students at our college are satisfied with the selection of food available on campus. We go to the latest cafeteria and interview every 10th person in line.</p>	<p>As per student’s IEP’s and 504’s, for example: extra time, provide a copy of the notes, provide a copy of the text to read in class.</p>

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<p><b>S-IC-B.3</b> Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.</p>	<p>SMP 8- Look for and express regularity in repeated reasoning.</p>	<p>Students will identify when a hypothesis should be answered by surveys, experiments or observational studies.</p>	<p>Text Exercise: It's a common belief that people behave strangely when there's a full moon and that as a result police and emergency rooms are busier than usual. Design a way you could find out whether there is any merit to this belief. Will you use an observational study or an experiment? Explain.</p>	<p>As per student's IEP's and 504's, for example: extra time, provide a copy of the notes, provide a copy of the text to read in class.</p>
<p><b>S-IC-B.5</b> Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.</p>	<p>SMP 5 - Use appropriate tools strategically.</p>	<p>Students will examine box plots displaying the results of experiments to identify if the differences are statistically significant.</p>	<p>Text Exercise: Will listening to a Mozart piano sonata make you smarter? A study in 1995 reported that when students were given a spatial reasoning section of a standard IQ test, those who listened to Mozart for 10 minutes improved their score more than those who simply sat quietly.</p> <ul style="list-style-type: none"> <li>a) Researchers said the differences were statistically significant, what does this mean?</li> <li>b) The experiment was repeated with 125 college students split into three groups: listening to a Mozart piano sonata, music by Philip Glass, and sitting for tens minutes in silence. Three days after treatment they were retested. Draw a diagram displaying the design of the experiment.</li> </ul>	<p>As per student's IEP's and 504's, for example: extra time, provide a copy of the notes, provide a copy of the text to read in class.</p>

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			<p>c) These boxplots show the differences in score before and after treatment for the three groups. Did the Mozart group show the greatest improvement?</p> 	
<p><b>Benchmark Assessment</b></p> <ul style="list-style-type: none"> <li>• Not applicable</li> </ul>		<p><b>Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)</b></p> <ul style="list-style-type: none"> <li>• As per student's IEP's and 504's, for example: extra time, use of a calculator.</li> </ul>		
<p><b>Summative Assessment(s)</b></p> <ul style="list-style-type: none"> <li>• Common Assessment 9 - S-IC-B.3</li> <li>• Common Assessment 10 - S-IC-A.1</li> <li>• Common Assessment 11 - S-IC-B.5</li> <li>• Performance Tasks- Chapters 9-11 (one per chapter)</li> </ul>				

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<b>Unit Title:</b> Unit 4 - Randomness & Probability	<b>Time Frame/Pacing:</b> 50 days
<b>Essential Questions</b> <ul style="list-style-type: none"><li>● What is randomness?</li><li>● What is probability and how does it affect our world?</li><li>● What are some specific probability models and how do we apply them?</li><li>● What is a random variable and how is it used in probability and statistics?</li></ul>	
<b>Enduring Understandings</b> <ul style="list-style-type: none"><li>● Probability models are useful tools for making decisions and predictions.</li><li>● The Law of Large Numbers is an important concept when simulating probability experiments.</li><li>● Probability models are useful tools for making decisions and predictions.</li></ul>	
<b>Standards Taught and Assessed</b> <ul style="list-style-type: none"><li>● <b>S-IC-A.2</b> Decide if a specified model is consistent with results from a given data-generating process.</li><li>● <b>S-CP-A</b> Understand independence and conditional probability and use them to interpret data.</li><li>● <b>S-CP-B</b> Use the rules of probability to compute probabilities of compound events in a uniform probability model.</li><li>● <b>S-MD-A</b> Calculate expected values and use them to solve problems.</li><li>● <b>S-MD-B</b> Use probability to evaluate outcomes of decisions.</li></ul>	
<b>Highlighted Interdisciplinary Connections</b> <ul style="list-style-type: none"><li>● <b>NJSLSA.W4</b> Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</li><li>● <b>NJSLSA.W5</b> Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.</li><li>● <b>NJSLSA.W6</b> Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.</li></ul>	
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<b>Pre-Assessment</b> <ul style="list-style-type: none"> <li><b>S-CP-B</b></li> </ul>		<b>Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)</b> <ul style="list-style-type: none"> <li>Extended time, use of calculator, challenge work and specific other accommodations/modifications per a student's IEP or 504 plan.</li> </ul>		
<b>Student Learning Objectives: We are learning to/that...</b>	<b>Student Strategies (Mathematical Practices)</b>	<b>Formative Assessment</b>	<b>Activities and Resources</b>	<b>Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)</b>
<b>S-IC-A.2</b> Decide if a specified model is consistent with results from a given data-generating process.	SMP 8 - Look for and express regularity in repeated reasoning.	Students will compare the expected outcomes to trials, i.e. rolling a die or tossing a coin.	Text Exercise: You are going to toss 4 coins. A) Create a sample space for the number of tails you could get. B) Explain why counting outcomes in that sample space can't tell you the probability that you'll get exactly two tails.	As per student's IEP's and 504's, for example: extra time, provide a copy of the notes, provide a copy of the text to read in class.
<b>S-CP-A</b> Understand independence and conditional probability and use them to interpret data.	SMP 2 - Reason abstractly and quantitatively.	Students will find the probability of independent events.	Text Exercise: You roll a fair die three times. What is the probability that A) you roll all 6's? B) you roll all odd numbers? C) you roll at least one 5? D) the numbers you roll are not 5's?	As per student's IEP's and 504's, for example: extra time, provide a copy of the notes, provide a copy of the text to read in class.
<b>S-CP-B</b> Use the rules of probability to compute probabilities of compound	SMP 6 - Attend to precision.	Students will be able to compute the probability of compound events.	Text Exercise: Seventy percent of kids who visit the doctor have a fever and 30% of kids with a fever	As per student's IEP's and 504's, for example: extra time, provide a

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events in a uniform probability model.			have sore throats. What is the probability that a kid who goes to the doctor has a fever and a sore throat?	copy of the notes, provide a copy of the text to read in class.
<b>S-MD-A</b> Calculate expected values and use them to solve problems.	SMP 6 - Attend to precision.	Expected values are used in business often to determine if a venture could be profitable or in determining the cost of insurance premiums.	Text Exercise: A car owner took their minivan for a repair because the air conditioner was cutting out intermittently. The mechanic identified the problem as dirt in a control unit. The mechanic said that in about 75% of such cases, drawing down and then recharging the coolant a couple of times cleans up the problem and costs \$60. If that fails, then the control unit must be replaced at a cost of \$140. A) Construct a probability model. B) What is the expected value of the cost of this repair? C) What does that mean in this context?	As per student's IEP's and 504's, for example: extra time, provide a copy of the notes, provide a copy of the text to read in class.
<b>S-MD-B</b> Use probability to evaluate outcomes of decisions.	SMP 2 - Reason abstractly and quantitatively.	Expected values are used in business often to determine if a venture could be profitable or in determining the cost of insurance premiums.		As per student's IEP's and 504's, for example: extra time, provide a copy of the notes, provide a copy of the text to read in class.
<b>Benchmark Assessment</b>		<b>Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)</b>		
<ul style="list-style-type: none"> <li>● Not applicable</li> </ul>				
<b>Summative Assessment(s)</b>		<ul style="list-style-type: none"> <li>● As per student's IEP's and 504's, for example: extra time, use of a calculator.</li> </ul>		
<ul style="list-style-type: none"> <li>● Common Assessment 12 - S-IC-A.1</li> <li>● Common Assessment 13 - S-IC-A.2</li> <li>● Common Assessment 14 - S-CP-A &amp; S-CP-B</li> <li>● Common Assessment 15- S-MD-A &amp; S-MD-B</li> <li>● Performance Tasks- Chapters 12-15 (one per</li> </ul>				



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chapter)	
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<b>Unit Title:</b> Unit 5 From the Data to the World at Large	<b>Time Frame/Pacing:</b> 20 days
<b>Essential Questions</b> <ul style="list-style-type: none"><li>• How do we determine if there is a statistically significant difference between two claims?</li><li>• How can we test data driven decisions?</li></ul>	
<b>Enduring Understandings</b> <ul style="list-style-type: none"><li>• Understanding the variability of our estimates will enable us to better understand the world.</li><li>• Hypothesis testing will help to inform a statistically supported decision.</li></ul>	
<b>Standards Taught and Assessed</b> <ul style="list-style-type: none"><li>• <b>S-IC-A1.</b> Understand statistics as a process for making inferences about population parameters based on a random sample from that population</li><li>• <b>S-IC-B4.</b> Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling</li></ul>	
<b>Highlighted Interdisciplinary Connections</b> <ul style="list-style-type: none"><li>• <b>NJSLSA.W4</b> Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</li><li>• <b>NJSLSA.W5</b> Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.</li><li>• <b>NJSLSA.W6</b> Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.</li></ul>	
<b>Highlighted Career Ready Practices and 21st Century Themes and Skill</b> <ul style="list-style-type: none"><li>• <b>9.4.2.IML.2</b> Represent data in a visual format to tell a story about the data (e.g., 2.MD.D.10).</li><li>• <b>9.4.2.IML.3</b> Use a variety of sources including multimedia sources to find information about topics such as climate change, with guidance and support from adults (e.g., 6.3.2.GeoGI.2, 6.1.2.HistorySE.3, W.2.6, 1-LSI-2).</li></ul>	
<b>Social Emotional Learning Competencies</b> <ul style="list-style-type: none"><li>• <b>CHPE. 2.1.12.EH.1</b> Recognize one's personal traits, strengths, and limitations and identify how to develop skills to support a healthy lifestyle.</li></ul>	

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<b>Pre-Assessment</b> <ul style="list-style-type: none"> <li>S-IC-A1</li> </ul>		<b>Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)</b> <ul style="list-style-type: none"> <li>Extended time, use of calculator, challenge work and specific other accommodations/modifications per a student's IEP or 504 plan.</li> </ul>		
<b>Student Learning Objectives: We are learning to/that...</b>	<b>Student Strategies (Mathematical Practices)</b>	<b>Formative Assessment</b>	<b>Activities and Resources</b>	<b>Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)</b>
<b>S-IC-A1.</b> Understand statistics as a process for making inferences about population parameters based on a random sample from that population	SMP 8 - Look for and express regularity in repeated reasoning.	Students will write and test hypotheses.	Text Exercise: "A large city's DMV claimed that 89% of candidates pass driving tests, but a newspaper reporter's survey of 90 randomly selected local teens who had taken the test found only 61 who passed."  Does this finding suggest that the passing rate for teenagers is lower than the DMV reported?	As per student's IEP's and 504's, for example: extra time, provide a copy of the notes, provide a copy of the text to read in class.
<b>S-IC-B4.</b> Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models	SMP 4 - Model with mathematics.	Students will use samples to make a confidence interval that estimates what proportion of a population has a certain characteristic.	Text Exercise: City voters will soon go to the polls to decide whether to support a tax increase to build a new high school. Approval of bond issues like this requires a 60% "super majority"	As per student's IEP's and 504's, for example: extra time, provide a copy of the notes, provide a copy of the text to read in class.

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<p>for random sampling.</p>			<p>of yes votes. A local radio station phones 148 randomly selected voters, and finds 96 in favor of building the school. A) Discuss the assumptions and conditions required to create a confidence interval for the true proportion. B) Create a 95% confidence interval. C) Explain why the station said the outcome was "too close to call." D) The local newspaper wants to conduct a poll of its own, with a margin of error only one-third as large. How many voters must the paper contact?</p>	
<p><b>Benchmark Assessment</b></p> <ul style="list-style-type: none"> <li>● Not applicable</li> </ul>		<p><b>Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)</b></p> <ul style="list-style-type: none"> <li>● As per student's IEP's and 504's, for example: extra time, use of a calculator.</li> </ul>		
<p><b>Summative Assessment(s)</b></p> <ul style="list-style-type: none"> <li>● Common Assessment 16 - S-IC-B4</li> <li>● Common Assessment 17 -S-IC-A1</li> <li>● Performance Tasks- Chapters 16 &amp; 17 (one per chapter)</li> </ul>				

**Bibliography**  
**CP Statistics**

Bock, D. E; Mariano, T. J.; Craine, W. B.; Velleman, P. F.; De Veaux, R. D. (2016). *Stats in your world*. Boston: Pearson.

Digital textbook materials:

[www.mymathlabforschool.com](http://www.mymathlabforschool.com)