

**Southington Public Schools
Curriculum Map**

Subject: Probability & Statistics

Grade: 12

UNIT TITLE	Comparing, Describing and Analyzing Data	Distribution	Unit 3
CONTENT	<ul style="list-style-type: none"> • Understand and apply statistical techniques to sets of data • Calculate measures of central tendency, z-scores, and coefficient of variation • Display sets of data using multiple representations 	<ul style="list-style-type: none"> • Calculate the probability of mutually exclusive and non-exclusive events • Understand and apply the differences between a permutation and a combination 	<ul style="list-style-type: none"> • Use the results of a probability experiment to make predictions • Identify and explain unusual results of an experiment
STATE STANDARDS	<p>4.2a(9-12C). Analyze real world problems using statistical techniques. <i>(3) Determine and use measures of spread and of central tendency to describe and compare sets of data.</i></p> <p>4.2a(9-12E). Describe and analyze sets of data using statistical models. <i>(1) Determine statistical measures to describe univariate data.</i></p>	<p>4.3a(9-12C) Understand and apply the principles of probability in a variety of situations <i>(1) Solve problems involving the probabilities of mutually exclusive events or complementary events</i></p> <p>4.3a(9-12E) Solve problems using the methods of discrete mathematics <i>(2) Explore the concepts of conditional probability and independent events in real world contexts</i></p>	<p>4.3b(9-12E) Make statistical inferences through the use of probability <i>4) Use relative frequency and expected values to represent and solve problems involving uncertainty</i></p>
ASSESSMENT	<p><u>PERFORMANCE TASK</u></p> <p>You are a statistician working for an auto insurance company. You will compare and analyze data from car crash fatalities based on the age of the victims. You will need to construct a frequency and relative frequency distribution for drivers killed in these car crashes. Then determine which age groups would have the highest insurance rates and justify why based on the data. Your final product will be to construct a graph that is effective in identifying the age categories that are prone to fatal car crashes.</p>	<p><u>PERFORMANCE TASK</u></p> <p>You are a job applicant at the Acton Paper Company. Your goal is to determine the effectiveness of the drug testing used for job applicants. This drug test may have cost you the job offer. Your final product will include the probabilities of a false positive, false negative, both on a whole and as a conditional probability, as well as a judgment of the testing from the applicant’s point of view.</p>	<p><u>PERFORMANCE TASK</u></p> <p>You are a patron of a casino. Your goal is to decide whether you lose more money playing the slots or the roulette wheel. Your final product will include the probabilities of the slot machine, the expected value for the slot machine and roulette wheel for both a 25 cent and one dollar bet, and an explanation of which game is more profitable.</p>

	<p><u>OTHER EVIDENCE</u></p> <ul style="list-style-type: none"> • Quiz – Frequency Distributions, Histograms, and Stem and Leaf • Quiz- Mean, Median, Mode, Boxplots • Test- Data Analysis • Homework • Teacher Observation 	<p><u>OTHER EVIDENCE</u></p> <ul style="list-style-type: none"> • Quiz – Permutations/Combinations • Quiz- Probability • Homework • Teacher Observation 	<p><u>OTHER EVIDENCE</u></p> <ul style="list-style-type: none"> • Test – Probability Distributions • Homework • Teacher Observation
SKILLS	<ul style="list-style-type: none"> • Define and identify a statistic and a parameter • Determine if data is good for statistical analysis • Construct a frequency and relative frequency distribution • Construct a histogram • Construct stem and leaf plots • Calculate mean, median, mode, range, and standard deviation • Calculate the coefficient of variation • Calculate z scores and identify unusual values 	<ul style="list-style-type: none"> • Analyze problems to determine if order is important • Choose and use the appropriate formula to find the total number of possible outcomes • Eliminate multiple occurring outcomes • Decide if there are single or multiple events • Determine actual odds against • Analyze a problem and conclude if the event is simple or compound • Calculate probability for simple and compound events and for single and multiple trials 	<ul style="list-style-type: none"> • Find the maximum and minimum values and interpret the results • Calculate expected values • Analyze two situations and decide which is a better choice • Identify a binomial probability distribution • Determine if a variable is discrete or continuous • Explain if a distribution is binomial • Analyze results for unusual values

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UNIT TITLE	Unit 4	Unit 5	Unit 6
CONTENT	<ul style="list-style-type: none"> Understand, construct, and analyze both normal and nonstandard distribution data Calculate values of a distribution of data and determine its inference for future outcomes 	<ul style="list-style-type: none"> Construct, Interpret, and Compare confidence intervals for sets of populations 	<ul style="list-style-type: none"> Calculate and Interpret linear correlation coefficients and regression equations Determine the most suitable predictor of a situation
STATE STANDARDS	4.3b(9-12E) Make statistical inferences through the use of probability <i>(1) Explore the characteristics and applications of the normal distribution and standardized scores</i>	4.3b(9-12E) Make statistical inferences through the use of probability <i>(2) Construct and interpret confidence intervals</i>	4.1a(9-12E) Model real data graphically using appropriate tools, technology, and strategies <i>(2) Apply and defend regression models for bivariate data and use them to make predictions</i>
ASSESSMENT	<p><u>PERFORMANCE TASK</u></p> <p>You have been hired by General Motors to design a new car seat. Your goal is to find a range of values acceptable sitting heights for most men and women. Your final product will include the different ranges of sitting heights for both men and women, discuss any differences, and include other accommodations that may also be important in the design of the seat.</p>	<p><u>PERFORMANCE TASK</u></p> <p>Your role is a coach for a sports team. Your goal is to choose a sports drink to use during practices and games. Your final product should include a conclusion on which drink is the best with statistical conclusions needed to support your opinion.</p>	<p><u>PERFORMANCE TASK</u></p> <p>Your role will vary based on the data set that you are given. Your goal is to determine if the two variables are related, and if it is possible to make predictions on your data set. Your final project should include a discussion of if the variables are related, if the data would give reliable predictions, statistical calculations, and a discussion of the results of these calculations.</p>

	<u>OTHER EVIDENCE</u>	<u>OTHER EVIDENCE</u>	<u>OTHER EVIDENCE</u>
	<ul style="list-style-type: none"> • Quiz- Normal Distribution • Test- Normal Distribution • Homework • Teacher Observation 	<ul style="list-style-type: none"> • Test – Estimates and Sample Size • Homework • Teacher Observation 	<ul style="list-style-type: none"> • Test – Correlation and Regression • Homework • Teacher Observation
SKILLS	<ul style="list-style-type: none"> • Construct normal distribution curves including labeling mean and shading areas • Analyze distribution curves to answer the appropriate question • Calculate z-scores and find probabilities • Use the normal distribution table to find values given areas • Recognize a nonstandard distribution and apply the standard curve to the appropriate information • Decide if the standard curve can be used in every situation • Analyze a situation to decide if the event is rare • Adapt calculations to samples larger than one • Convert values to standard scores 	<ul style="list-style-type: none"> • Identify point estimates for population parameters and means • Construct confidence intervals • Interpret the meaning of a confidence interval • Determine the appropriate sample size • Compare confidence intervals for at least two populations and make conclusions • Decide which distribution is necessary based on the sample 	<ul style="list-style-type: none"> • Calculate linear correlation coefficients • Interpret the strength of data based on the correlation coefficient and scatterplots • Find the coefficient of determination and interpret how much variation is explained • Find the regression equation • Examine the situation and select the appropriate method for predicting values • Judge if a point is an outlier and/or influential point • Construct a prediction interval based on a given x value • Interpret the meaning of the prediction interval