Beal City High School
Algebra 2B Curriculum and Alignment

UNIT 1 Probability (Chapters 1, 6, 9, 12)

1. Simulation (1-6)
2. Theoretical Probability (1-6)
3. Counting and Permuations (6-7)
4. Combinations (6-7)
5. Pascal's triangle (Int 2)
6. Multiple events (independent, dependent, mutually exclusive, complementary) (9-7)
7. Probability distribution (12-1)
8. Conditional probability (12-2)
9. Expected Value (Int 3)
10. Binomial Experiments (12-6, Int 3)
11. Binomial Theorem (Int 2)

CCSS:

A-APR.5. (+) Know and apply the Binomial Theorem for the expansion of $(x + y)^n$ in powers of x and y for a positive integer n, where x and y are any numbers, with coefficients determined for example by Pascal's Triangle.

- For small values of n, use Pascal's Triangle to determine the coefficients of the binomial expansion.
- Use the Binomial Theorem to find the nth term in the expansion of a binomial to a positive power.

S-IC.2. Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation. For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model?

- Design simulations of random sampling: assign digits in appropriate proportions for events, carry out the simulation using random number generators and random number tables and explain the outcomes in context of the population and the known proportions.

S-IC.5. Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.

S-CP.1. Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").

- Define a sample space and events within the sample space. Identify subsets from sample space given defined events, including unions, intersections and complements of events.

S-CP.2. Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.

- Identify two events as independent or not. Explain properties of Independence and Conditional Probabilities in context and simple English.

S-CP.3. Understand the conditional probability of A given B as P(A and B)/P(B), and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.

- Define and calculate conditional probabilities. Use the Multiplication Principal to decide if two events are independent and to calculate conditional probabilities.

S-CP.4. Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. For example, collect data from a random sample of students

in your school on their favorite subject among math, science, and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results.

- Construct and interpret two-way frequency tables of data for two categorical variables. Calculate probabilities from the table. Use probabilities from the table to evaluate independence of two variables.

S-CP.5. Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer.

- Recognize and explain the concepts of independence and conditional probability in everyday situations.

S-CP.6. Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in terms of the model.

- Calculate conditional probabilities using the definition: ―the conditional probability of A given B as the fraction of B's outcomes that also belong to A‖. Interpret the probability in context.

S-CP.7. Apply the Addition Rule, P(A or B) = P(A) + P(B) – P(A and B), and interpret the answer in terms of the model.

- Identify two events as disjoint (mutually exclusive). Calculate probabilities using the Addition Rule. Interpret the probability in context.

S-CP.8. (+) Apply the general Multiplication Rule in a uniform probability model, P(A and B) = P(A)P(B|A) = P(B)P(A|B), and interpret the answer in terms of the model.

- Calculate probabilities using the General Multiplication Rule. Interpret in context.

S-CP.9. (+) Use permutations and combinations to compute probabilities of compound events and solve problems.

- Identify situations as appropriate for use of a permutation or combination to calculate probabilities. Use permutations and combinations in conjunction with other probability methods to calculate probabilities of compound events and solve problems.

S-MD.1. (+) Define a random variable for a quantity of interest by assigning a numerical value to each event in a sample space; graph the corresponding probability distribution using the same graphical displays as for data distributions.

- Understand what a random variable is and the properties of a random variable.
- Given a probability situation (theoretical or empirical), be able to define a random variable, assign probabilities to its sample space, create a table and graph of the distribution of the random variable.

S-MD.2. (+) Calculate the expected value of a random variable; interpret it as the mean of the probability distribution.

- Calculate and interpret in context the expected value of a random variable.

S-MD.3. (+) Develop a probability distribution for a random variable defined for a sample space in which theoretical probabilities can be calculated; find the expected value. For example, find the theoretical probability distribution for the number of correct answers obtained by guessing on all five questions of a multiple-choice test where each question has four choices, and find the expected grade under various grading schemes.

- Develop a theoretical probability distribution and find the expected value.

S-MD.4. (+) Develop a probability distribution for a random variable defined for a sample space in which probabilities are assigned empirically; find the expected value. For example, find a current data distribution on the number of TV sets per household in the United States, and calculate the expected number of sets per household. How many TV sets would you expect to find in 100 randomly selected households?

- Develop an empirical probability distribution and find the expected value.

S-MD.5. (+) Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values. (Set up a probability distribution for a random variable representing payoff values in a game of chance.)

a. Find the expected payoff for a game of chance. For example, find the expected winnings from a state lottery ticket or a game at a fast-food restaurant.

b. Evaluate and compare strategies on the basis of expected values. For example, compare a high-deductible versus a low-deductible automobile insurance policy using various, but reasonable, chances of having a minor or a major accident.

S-MD.6. (+) Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator).

- Make decisions based on expected values. Use expected values to compare long term benefits of several situations.

S-MD.7. (+) Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).

- Explain in context decisions made based on expected values.

UNIT 2 Conic Sections and Sequences (Chapters 10 & 11)

1. Identifying conic equations and graphs (10-1)
2. Circles (10-3)
3. Ellipses (10-4)
4. Hyperbolas (10-5)
5. Parabolas (10-2)
6. Patterns and explicit formulas (11-1)
7. Recursive Formulas (11-2, 3)
8. Arithmetic and Geometric Sequences (11-2, 3)
9. Arithmetic and Geometric Series (11-4, 5)

CCSS:

A-SSE.4. Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. *For example, calculate mortgage payments.*

- Develop the formula for the sum of a finite geometric series when the ratio is not 1.
- Use the formula to solve real world problems such as calculating the height of a tree after n years given the initial height of the tree and the rate the tree grows each year. Calculate mortgage payments.

F-IF.3. Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the Fibonacci sequence is defined recursively by $f(0) = f(1) = 1$, $f(n+1) = f(n) + f(n-1)$ for $n \geq 1$.

- Recognize that sequences, sometimes defined recursively, are functions whose domain is a subset of the set of integers.

F-BF.1. Write a function that describes a relationship between two quantities.

a. Determine an explicit expression, a recursive process, or steps for calculation from a context. (From context, write an explicit expression, define a recursive process, or describe the calculations needed to model a function between two quantities.)

F-BF.2. Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.

- Write arithmetic sequences recursively and explicitly, use the two forms to model a situation, and translate between the two forms.
- Write geometric sequences recursively and explicitly, use the two forms to model a situation, and translate between the two forms.
- Understand that linear functions are the explicit form of recursively-defined arithmetic sequences and that exponential functions are the explicit form of recursively-defined geometric sequences.

F-LE.2. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).

G-GPE.1. Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation.

- Use the Pythagorean Theorem to derive the equation of a circle, given the center and the radius.
- Given an equation of a circle, complete the square to find the center and radius of a circle.

G-GPE.2. Derive the equation of a parabola given a focus and directrix.

- Given a focus and directrix, derive the equation of a parabola.
- Given a parabola, identify the vertex, focus, directrix, and axis of symmetry, noting that every point on the parabola is the same distance from the focus and the directrix

G-GPE.3. (+) Derive the equations of ellipses and hyperbolas given the foci, using the fact that the sum or difference of distances from the foci is constant.

- Given the foci, derive the equation of an ellipse, noting that the sum of the distances from the foci to any fixed point on the ellipse is constant, identifying the major and minor axis.
- Given the foci, derive the equation of a hyperbola, noting that the absolute value of the differences of the distances form the foci to a point on the hyperbola is constant, and identifying the vertices, center, transverse axis, conjugate axis, and asymptotes.

UNIT 3 Statistics and Data (Chapter 12)

1. Data collection and sampling/margin of error (12-5 and Int 2)
2. Sampling Methods (Int 2)
3. Bias (conf, Int 2, 12-5)
4. Observational vs. experimental design (conf, internet)
5. Types of data (quantitative discrete/continuous, categorical (conf)
6. Types of graphs (conf)
7. Analyzing data (mean, median, mode, range, interquartile range, outliers) (12-3, conf)
8. Distribution (conf)
9. Standard deviation, variance (12-4)
10. Normal distribution and 68-95-99.7 rule (12-7, conf)
11. Z-scores and percentiles (12-4, conf)
12. Regression

CCSS:

N-Q.1. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

- Interpret units in the context of the problem
- When solving a multi-step problem, use units to evaluate the appropriateness of the solution.
- Choose the appropriate units for a specific formula and interpret the meaning of the unit in that context.
- Choose and interpret both the scale and the origin in graphs and data displays

N-Q.2. Define appropriate quantities for the purpose of descriptive modeling.

- Determine and interpret appropriate quantities when using descriptive modeling.

S-ID.1. Represent data with plots on the real number line (dot plots, histograms, and box plots).

- Construct dot plots, histograms and box plots for data on a real number line.

S-ID.2. 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.

- Describe a distribution using center and spread.
- Use the correct measure of center and spread to describe a distribution that is symmetric or skewed.

- Identify outliers (extreme data points) and their effects on data sets.
- Compare two or more different data sets using the center and spread of each.

S-ID.3. Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).

- Interpret differences in different data sets in context. Interpret differences due to possible effects of outliers.

S-ID.4. 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.

- Identify data sets as approximately normal or not.
- Use the mean and standard deviation to fit it to a normal distribution where appropriate.
- Use calculators, spreadsheets, and tables to estimate areas under the normal curve.
- Interprets areas under a normal curve in context.

S-ID.5. 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.

- Create a two-way table from two categorical variables and read values from two way table. Interpret joint, marginal, and relative frequencies in context.
- Recognize associations and trends in data from a two-way table.

S-ID.6. Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.

a. Fit a function to the data; 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, quadratic, and exponential models. (Categorize data as linear or not. Use algebraic methods and technology to fit a linear function to the data. Use the function to predict values. Explain the meaning of the slope and y-intercept in context. Categorize data as exponential. Use algebraic methods and technology to fit an exponential function to the data. Use the function to predict values. Explain the meaning of the growth rate and y-intercept in context. Categorize data as quadratic. Use algebraic methods and technology to fit a quadratic function to the data. Use the function to predict values. Explain the meaning of the constant and coefficients in context.)

b. Informally assess the fit of a function by plotting and analyzing residuals. (Calculate a residual. Create and analyze a residual plot.)

c. Fit a linear function for a scatter plot that suggests a linear association. (Categorize data as linear or not. Use algebraic methods and technology to fit a linear function to the data. Use the function to predict values.)

S-ID.9. Distinguish between correlation and causation.

- Explain the difference between correlation and causation.

S-IC.1. Understand that statistics allows inferences to be made about population parameters based on a random sample from that population.

- Explain in context the difference between values describing a population and a sample.

S-IC.2. Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation. For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model?

- Explain how well and why a sample represents the variable of interest from a population.
- Demonstrate understanding of the different kinds of sampling methods.
- Design simulations of random sampling: assign digits in appropriate proportions for events, carry out the simulation using random number generators and random number tables and explain the outcomes in context of the population and the known proportions.

S-IC.3. Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.

- Identify situations as either sample survey, experiment, or observational study. Discuss the appropriateness of each one's use in contexts with limiting factors.
- Design or evaluate sample surveys, experiments and observational studies with randomization. Discuss the importance of randomization in these processes.

S-IC.4. 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.

- Use sample means and sample proportions to estimate population values.
- Conduct simulations of random sampling to gather sample means and sample proportions. Explain what the results mean about variability in a population and use results to calculate margins of error for these estimates.

S-IC.5. Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.

- Evaluate effectiveness and differences in two treatments based on data from randomized experiments. Explain in context.
- Use simulations to generate data simulating application of two treatments. Use results to evaluate significance of differences.

S-IC.6. Evaluate reports based on data.

- Read and explain in context data from outside reports.

UNIT 4 Trigonometry (Chapters 13 & 14)

1. Periodic models (13-1)
2. Polar graphing (13-2)
3. Special Right Triangles (pg 717)
4. Radians (13-3)
5. Sine, cosine, tangent and the unit circle (13-4,5,6)
6. Sine, cosine, and tangent graphs (13-4,5,6)
7. Trig graph transformations (13-7)
8. Trig identities (14-1)
9. Trig inverse and equations (14-2)

CCSS:

F-TF.1. Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.

- Know that if the length of an arc subtended by an angle is the same length as the radius of the circle, then the measure of the angle is 1 radian.
- Know that the graph of the function, f, is the graph of the equation y=f(x).

F-TF.2. Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.

- Explain how radian measures of angles rotated counterclockwise in a unit circle are in a one-to-one correspondence with the nonnegative real numbers, and that angles rotated clockwise in a unit circle are in a one-to-one correspondence with the non-positive real numbers.

F-TF.3. (+) Use special triangles to determine geometrically the values of sine, cosine, tangent for $\pi/3$, $\pi/4$ and $\pi/6$, and use the unit circle to express the values of sine, cosines, and tangent for x, $\pi + x$, and $2\pi - x$ in terms of their values for x, where x is any real number.

- Use 30º-60º-90º and 45º-45º-90º triangles to determine the values of sine, cosine, and tangent.

F-TF.4. (+) Use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions.

- Use the unit circle and periodicity to find values of sine, cosine, and tangent for any value of θ, such as $\pi+ \theta$, $2\pi +\theta$, where θ is a real number.
- Use the values of the trigonometric functions derived from the unit circle to explain how trigonometric functions repeat themselves.

F-TF.5. Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline.

- Use sine and cosine to model periodic phenomena such as the ocean's tide or the rotation of a Ferris wheel.
- Given the amplitude; frequency; and midline in situations or graphs, determine a trigonometric function used to model the situation.

F-TF.6. (+) Understand that restricting a trigonometric function to a domain on which it is always increasing or always decreasing allows its inverse to be constructed.

- Know that the inverse for a trigonometric function can be found by restricting the domain of the function so it is always increasing or decreasing.

F-TF.7. (+) Use inverse functions to solve trigonometric equations that arise in modeling contexts; evaluate the solutions using technology, and interpret them in terms of the context.

- Use the inverse of trigonometric functions to solve equations that arise in real-world contexts.
- Use technology to evaluate the solutions to the inverse trigonometric functions, and interpret their meaning in terms of the context.

F-TF.8. Prove the Pythagorean identity $\sin2(\theta) + \cos2(\theta) = 1$ and use it to find $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ given $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ and the quadrant of the angle.

- Use the unit circle to prove the Pythagorean identity $\sin2(\theta) + \cos2(\theta) = 1$.
- Given the value of the $\sin(\theta)$ or $\cos(\theta)$, use the Pythagorean identity $\sin2(\theta) + \cos2(\theta) = 1$ to calculate other trigonometric ratios.

Algebra 2B—12th grade

Units		Common Core Standards	Vocabulary	Pacing
Unit 1: Probability	Chapter 1, Section 6 Chapter 6, Section 7 Chapter 9, Section 7 Chapter 12, Section 1 Chapter 12, Section 2 Chapter 12, Section 6 Integrated 2 text Integrated 3 text	**A-APR.5.** (+) Know and apply the Binomial Theorem for the expansion of (x + y)n in powers of x and y for a positive integer n, where x and y are any numbers, with coefficients determined for example by Pascal's Triangle. **S-IC.2.** Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation. For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model? **S-IC.5.** Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant. **S-CP.1.** Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not"). **S-CP.2.** Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent. **S-CP.3.** Understand the conditional probability of A given B as P(A and B)/P(B), and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B. **S-CP.4.** Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. For example, collect data from a random sample of students in your school on their favorite subject among math, science, and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results. **S-CP.5.** Recognize and explain the concepts of conditional probability and independence in everyday language and everyday situations. For example, compare the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer. **Assessments:** Multiple Quizzes Final Test	Simulation Theoretical probability Counting Tree diagram Systematic list Multiplication counting principle Factorial Permutations Combinations Pascal's triangle Independent events Dependent events Mutually exclusive events Complementary events Probability distribution Conditional probability Expected value Binomial experiments Binomial theorem	25 days

Algebra 2B—12th grade

Units	Common Core Standards (cont.)	Vocabulary	Pacing
Unit 1: Probability (cont.)	**S-CP.6.** Find the conditional probability of A given B as the fraction of B's outcomes that also belong to A, and interpret the answer in terms of the model. **S-CP.7.** Apply the Addition Rule, P(A or B) = P(A) + P(B) – P(A and B), and interpret the answer in terms of the model. **S-CP.8.** (+) Apply the general Multiplication Rule in a uniform probability model, P(A and B) = P(A)P(B|A) = P(B)P(A|B), and interpret the answer in terms of the model. **S-CP.9.** (+) Use permutations and combinations to compute probabilities of compound events and solve problems. **S-MD.1.** (+) Define a random variable for a quantity of interest by assigning a numerical value to each event in a sample space; graph the corresponding probability distribution using the same graphical displays as for data distributions. **S-MD.2.** (+) Calculate the expected value of a random variable; interpret it as the mean of the probability distribution. **S-MD.3.** (+) Develop a probability distribution for a random variable defined for a sample space in which theoretical probabilities can be calculated; find the expected value. For example, find the theoretical probability distribution for the number of correct answers obtained by guessing on all five questions of a multiple-choice test where each question has four choices, and find the expected grade under various grading schemes. **S-MD.4.** (+) Develop a probability distribution for a random variable defined for a sample space in which probabilities are assigned empirically; find the expected value. For example, find a current data distribution on the number of TV sets per household in the United States, and calculate the expected number of sets per household. How many TV sets would you expect to find in 100 randomly selected households? **S-MD.5.** (+) Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values. (Set up a probability distribution for a random variable representing payoff values in a game of chance.) **S-MD.6.** (+) Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator). **S-MD.7.** (+) Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).		

Algebra 2B—12th grade

Units		Common Core Standards	Vocabulary	Pacing
Unit 2: Conic Sections and Sequences	Chapter 10, Section 1 Chapter 10, Section 3 Chapter 10, Section 4 Chapter 10, Section 5 Chapter 10, Section 2 Chapter 11, Section 1 Chapter 11, Section 2 Chapter 11, Section 3 Chapter 11, Section 4 Chapter 11, Section 5	**A-SSE.4.** Derive the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. *For example, calculate mortgage payments.* **F-IF.3.** Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the Fibonacci sequence is defined recursively by $f(0) = f(1) = 1$, $f(n+1) = f(n) + f(n-1)$ for $n \geq 1$. **F-BF.1.** Write a function that describes a relationship between two quantities. **F-BF.2.** Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms. **F-LE.2.** Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table). **G-GPE.1.** Derive the equation of a circle of given center and radius using the Pythagorean Theorem; complete the square to find the center and radius of a circle given by an equation. **G-GPE.2.** Derive the equation of a parabola given a focus and directrix. **G-GPE.3. (+)** Derive the equations of ellipses and hyperbolas given the foci, using the fact that the sum or difference of distances from the foci is constant. **Assessments:** Multiple Quizzes Final Test	Conic sections Cones Circles Center/radius Ellipses Foci Vertices/co-vertices Major/minor axis Hyperbolas Asymptotes Parabolas Directrix Patterns Explicit formulas Recursive formulas Arithmetic sequences Geometric sequences Arithmetic series Geometric series	45 days

Algebra 2B—12th grade

Units		Common Core Standards	Vocabulary	Pacing
Unit 3: Statistics and Data	Chapter 12, Section 5 Chapter 12, Section 3 Chapter 12, Section 4 Chapter 12, Section 7 Integrated 2 Text Many other conference resources	**N-Q.1.** Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. **N-Q.2.** Define appropriate quantities for the purpose of descriptive modeling. **S-ID.1.** Represent data with plots on the real number line (dot plots, histograms, and box plots). **S-ID.2**. 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. **S-ID.3.** Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers). **S-ID.4.** 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. **S-ID.5**. 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. **S-ID.6**. Represent data on two quantitative variables on a scatter plot, and describe how the variables are related. **S-ID.9.** Distinguish between correlation and causation. **S-IC.1.** Understand that statistics allows inferences to be made about population parameters based on a random sample from that population. **S-IC.2.** Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation. For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model? **Assessments:** Multiple Quizzes Group Project Final Test	Sampling Sample proportion Margin of error Population proportion Census Random Stratified random Systematic Convenience Cluster Bias Observational design Experimental design Quantitative discrete Quantitative continuous Categorical Line plot Dot plot Bar graph Case-value plot Circle graph Stem plot Histogram Box plot Line graph Scatterplot Mean/median/mode Range Interquartile range	44 days

Algebra 2B—12th grade

Units		Common Core Standards (cont.)	Vocabulary (cont)	Pacing
Unit 3: Statistics and Data (cont.)		**S-IC.3.** Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each. **S-IC.4.** 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. **S-IC.5.** Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant. **S-IC.6.** Evaluate reports based on data.	Outliers Skewed distribution Symmetrical distribution Uniform distribution Bimodal distribution Standard deviation Variance Normal distribution Empirical (68-95-99.7) rule Z-scores Percentiles Regression Control charts	

Algebra 2B—12th grade

Units		Common Core Standards	Vocabulary	Pacing
Unit 4: Trigonometry	Chapter 13, Section 1 Chapter 13, Section 2 Pg 717 Chapter 13, Section 3 Chapter 13, Section 4 Chapter 13, Section 5 Chapter 13, Section 6 Chapter 13, Section 7 Chapter 14, Section 1 Chapter 14, Section 2	**F-TF.1.** Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle. **F-TF.2.** Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle. **F-TF.3.** (+) Use special triangles to determine geometrically the values of sine, cosine, tangent for $\pi/3$, $\pi/4$ and $\pi/6$, and use the unit circle to express the values of sine, cosines, and tangent for x, π + x, and 2π – x in terms of their values for x, where x is any real number. **F-TF.4.** (+) Use the unit circle to explain symmetry (odd and even) and periodicity of trigonometric functions. **F-TF.5.** Choose trigonometric functions to model periodic phenomena with specified amplitude, frequency, and midline. **F-TF.6.** (+) Understand that restricting a trigonometric function to a domain on which it is always increasing or always decreasing allows its inverse to be constructed. **F-TF.7**. (+) Use inverse functions to solve trigonometric equations that arise in modeling contexts; evaluate the solutions using technology, and interpret them in terms of the context. **F-TF.8.** Prove the Pythagorean identity $\sin^2(\theta) + \cos^2(\theta) = 1$ and use it to find $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ given $\sin(\theta)$, $\cos(\theta)$, or $\tan(\theta)$ and the quadrant of the angle. **Assessments:** Multiple Quizzes Final Test	Periodic Cycle Period Frequency Axis Amplitude Polar graphing Standard position Coterminal angles Special right triangles Radians Sine/cosine/tangent Unit circle Secant/cosecant/cotangent Trig graphs Trig identities Trig inverse functions Solving trig equations	25 days