	Jackson County Core Curriculum Collaborative (JC4)
	Algebra 2
Standard	**Learning Targets in Student Friendly Language**
N.CN.1	I can describe complex numbers in terms of their real and imaginary parts.
	I can define the imaginary number *i* as a complex number where $i^2 = -1$.
	I can explain how every complex number has the form $a + bi$ where a and b are both real numbers.
	I can identify the real and the imaginary part of a complex number.
N.CN.2	I can apply the commutative, associative, and distributive properties to complex numbers in order to add, subtract, and multiply them.
	I can use the commutative and associative properties to add and subtract complex numbers.
	I can use the commutative, associative, and distributive properties to multiply complex numbers.
	I can create and explain algorithms for rewriting terms involving *i* with an exponent of 2 or higher.
	I can explain how the properties of real numbers extend to complex numbers.
N.CN.7	I can solve quadratic equations with real coefficients that have complex solutions.
	I can determine when a quadratic equation has complex solutions by looking at its graph or by calculating the discriminant.
	I can solve quadratic equations with real numbers as coefficients.
	I can express the solution of a quadratic equation as a complex number, $a+bi$.
N.CN.8+	I can use algebraic reasoning to simplify and extend polynomial identities to complex numbers.
	I can discover simple extensions of polynomial identities to complex number representations.
	I can write a generalization for how the difference of squares identity extends to the complex numbers.
	I can write a generalization for how the square of a binomial extends to the complex numbers.
N.CN.9+	I can explain the Fundamental Theorem of Algebra and show that the FTA holds for all quadratic polynomials.
	I can explain the Fundamental Theorem of Algebra.
	I can determine the number of roots possible for a polynomial equation based on its degree.
	I can use graphs to illustrate why all quadratics have two roots.
A.SSE.1.a	I can interpret the parts of an expression that describe a real-world scenario, this includes the factors, coefficients, and terms.
	I can interpret the meaning of coefficients of an expression based on the context.
	I can interpret the meaning of factors of an expression based on the context.
	I can interpret the meaning of each term in an expression based on the context.
A.SSE.1.b	I can use grouping strategies to interpret algebraic expressions that describe real-world scenarios.
	I can group the parts of an expression differently in order to better interpret their meaning.
	I can break down complex expressions into parts to better understand the context by analyzing one part at a time.
A.SSE.2	I can identify common structures of an expression (such as the difference of two squares) and use that structure to rewrite it.
	I can recognize familiar patterns in the structure of an expression.
	I can rewrite an expression using a familiar pattern to make it easier to use.
	I can factor expressions using their structure as clues.
	I can explain why equivalent expressions are equivalent.

A.SSE.4	I can derive the formula for a finite geometric series and use it to solve problems.
	I can explain the parts of a geometric sequence and a geometric series.
	I can derive the formula for the sum of a finite geometric series.
	I can apply the sum for a geometric series to contextual problems.
A.APR.1	I can relate integer arithmetic to polynomial arithmetic (they are closed under the same operations) and become fluent in adding, subtracting, and multiplying polynomials.
	I can compare and contrast integer arithmetic to polynomial arithmetic.
	I can add and subtract polynomial expressions.
	I can multiply polynomial expressions.
	I can define closure.
	I can apply the definition of polynomials to explain why polynomials are closed under the operations of addition, subtraction, and multiplication.
A.APR.2	I can apply the Remainder Theorem in order to determine the factors (or zeros) of a polynomial.
	I can explain the Remainder Theorem and how it relates to the identification of factors.
	I can use the Remainder Theorem to confirm factors of polynomial expressions.
	I can divide polynomials using long division.
	I can divide polynomials using synthetic division.
A.APR.3	I can construct rough graphs of polynomial functions when the polynomial functions can be appropriately factored.
	I can identify the zeros of factored polynomials.
	I can identify the multiplicity of the zeroes of a factored polynomial.
	I can use end behavior, leading coefficient, zeros and their multiplicity to produce a rough graph of a polynomial.
A.APR.4	I can prove polynomial identities algebraically and use them to describe numerical relationships.
	I can verify whether a given polynomial equation is true or not.
	I can determine what numeric pattern may be described by an identity by substituting different values into the identity.
A.APR.5+	I can explain the Binomial Theorem for the expansion of (x + y)^n, determine patterns in powers and coefficients, and use these patterns to expand binomials of the form (x + y)^n.
	I can apply the combination formula to *n* items taken *k* at a time.
	I can explain the steps for expanding a polynomial of the form (a+b)^n, using the Binomial Theorem.
	I can generate Pascal's Triangle to find the coefficients of a binomial expansion.
	I can find terms for an expanded product using the Binomial Theorem.
A.APR.6	I can determine the quotient and remainder of rational expressions using inspection, long division, and/or a computer algebra system.
	I can define a rational expression.
	I can determine the best method of simplifying the given rational expressions.
	I can write a rational expression a(x)/ b(x) in the quotient and remainder form, q(x) + r(x)/b(x).
	I can use long division and/or synthetic substitution to rewrite rational expressions in different forms.
	I can explain how polynomial division relates to the Remainder Theorem.
A.APR.7+	I can describe the similarities between the set of rational numbers and rational expressions and their operations.
	I can add and subtract rational expressions.
	I can multiply and divide rational expressions.

	I can simplify rational expressions.
	I can apply the definition of a rational expression to explain why adding, subtracting, multiplying, or dividing two rational expressions always produce a rational expression.
A.CED.1	I can look for patterns in one variable in data, contextual situations, and other numeric patterns to create equations and inequalities which can be used to solve contextual problems.
	I can create equations and inequalities in one variable to solve real-world problems involving simple rational functions and exponential functions.
	I can interpret the solution in the context of the problem.
	I can determine the best model for the real-world problem.
	I can explain my reasoning and steps when creating an equation or inequality.
	I can solve and interpret the solutions to one variable equation and inequality problems.
	I can describe the relationship between the quantities in the problem.
A.CED.2	I can look for patterns in bivariate data, contextual situations, and other numeric patterns to create equations and inequalities which can be used to solve the contextual problem.
	I can identify the variables and quantities represented in a real-world problem.
	I can justify which quantities in a real-world problem are dependent and independent of one another.
	I can correctly choose an appropriate function family for modeling a situation, including simple rational, radical, polynomial, and trigonometric.
	I can create an equation, inequality, or system to model a situation with two variables.
	I can graph one or more created equations on a coordinate axes with appropriate labels and scales.
A.CED.3	I can represent constraints symbolically and determine whether solutions are viable or non-viable in the given context.
	I can use contexts to determine constraints for equations and inequalities.
	I can use contexts to determine the constraints for systems of equations and inequalities.
	I can explain my reasoning for defining a constraint.
	I can contextually, analytically, and graphically explain why a solution is viable or non-viable.
	I can determine and write the system of equations or inequalities that best models the problem with constraints.
A.CED.4	I can solve formulas for a particular variable of interest.
	I can solve a formula for another variable using inverse operations and properties of equality.
A.REI.2	I can solve rational and radical equations in one variable and determine extraneous solutions.
	I can explain how extraneous solutions may arise from rational or radical equations.
	I can explain the steps used to solve a rational equation.
	I can solve rational equations with one variable.
	I can solve radical equations in one variable.
	I can identify extraneous solutions.
	I can explain what causes an extraneous solution.
A.REI.11	I can describe and interpret the solution set of a system of equations graphically and relate that to the algebraic solution.
	I can determine the approximate solutions of systems of equations using technology, tables, or successive approximations.
	I can find solutions to systems of linear, polynomial, rational, absolute value, exponential and logarithmic functions by graphing on technology.

	I can find solutions to systems of linear, polynomial, rational, absolute value, exponential and logarithmic functions using a table.
	I can find approximate solutions to systems of equations by using a graphing calculator.
	I can explain that a point of intersection on the graph of a system of equations represents a solution to both equations.
	I can explain how the x-coordinate of the solution to the system of y=f(x) and y=g(x) solves the equation f(x)=g(x).
F.IF.4	I can analyze and interpret the key features of a function using a graph or table. These key features include: intercepts; intervals where the function is increasing, decreasing, positive or negative; relative maximums and minimums; symmetries; end behavior; periodicity.
	I can describe and sketch a graphic representation of a function given a verbal description of the relationship.
	I can explain the meaning of key features (intercepts, intervals of increasing/decreasing, intervals of positive/negative, relative minimums/maximums, symmetry, end behavior, periodicity) of graphs and tables in the context of problems.
	I can define a periodic function as one that repeats its output values at regular intervals.
	I can identify the period of a function from a table or graph.
	I can use the problem situation to explain why the function is periodic.
	I can create a graph that matches the description and indicates all of the key features of the function.
F.IF.5	I can describe an appropriate domain of a function given its real-world context.
	I can tell the domain of a function from its graph.
	I can use the domain of a function to restrict a graph.
	I can determine the domain of a function from its equation and explain why that domain would be suitable.
	I can determine a reasonable domain based on the context of a story problem.
	I can explain why the function for a given context has a continuous or discrete range.
F.IF.6	I can calculate and interpret the average rate of change of a function, presented algebraically or numerically, over a specific interval and estimate this rate given a graph.
	I can explain what the average rate of change means in the context of the problem.
	I can calculate and interpret the average rate of change of a function, presented algebraically or numerically, over a specific interval in the domain.
	I can estimate the average rate of change given a function's graph.
F.IF.7.a	I can graph linear and quadratic functions that are expressed symbolically and show their intercepts, maxima, and minima.
	I can graph linear and quadratic functions, when expressed in various symbolic forms, by hand in simple cases and by using technology in complicated cases.
	I can recognize linear and quadratic families from their symbolic forms and graphical forms.
	I can describe key components of linear functions such as intercepts and rates of change.
	I can describe key components of quadratic functions such as intercepts, extrema, axis of symmetry, and end behavior.
F.IF.7.b	I can graph square root, cube root, and piecewise-defined functions that are expressed symbolically and show key features of their graphs.
	I can define piecewise functions as functions that have different rules for evaluation depending on the value of the input.
	I can explain an efficient process for graphing piecewise functions and for determining their domain and range.

	I can graph a piecewise function by graphing it's component parts.
	I can sketch a graph of a square root function by hand using convenient values of x as inputs.
	I can sketch a graph of a cube root function by hand using convenient values of x as inputs.
F.IF.7.c	I can graph polynomial functions that are expressed symbolically and show their zeros and end behavior.
	I can graph polynomials and determine their end behavior.
	I can find the zeros of polynomial functions by factoring.
F.IF.7.e	I can graph exponential, logarithmic, and trigonometric functions that are expressed symbolically and show their key features.
	I can find the key features of and then graph exponential functions. (intercepts, end behavior)
	I can find the key features of and then graph logarithmic functions. (intercepts, end behavior)
	I can find the key features of and then graph trigonometric functions. (period, midline, amplitude)
F.IF.8.a	I can manipulate a quadratic expression by factoring and completing the square to find and interpret a quadratic function's zeros, extreme values, and symmetry.
	I can explain the relationship between the zeros and binomial factors of a quadratic equation.
	I can factor a quadratic equation to reveal the zeros.
	I can complete the square in a quadratic function to produce an equivalent function.
	I can identify and interpret zeros, extreme values, and symmetry of the graph of a quadratic function.
F.IF.8.b	I can use the properties of exponents to interpret the meaning of exponential functions.
	I can classify an exponential function as representing exponential growth or decay by examining the base.
	I can use the properties of exponents to interpret expressions for exponential functions in a real-world context.
	I can express the growth or decay rate as a percentage rate of change.
F.IF.9	I can compare properties of two functions represented differently (graphs, tables, equations, verbal descriptions) and draw conclusions based on those comparisons.
	I can compare features (intercepts, intervals of increasing/decreasing, intervals of positive/negative, relative minimums/maximums, symmetry, end behavior) of two functions represented in a different way (algebraically, graphically, numerically, or verbally).
F.BF.1.a	I can use contextual situations and sets of ordered pairs to create functions to describe the relationship explicitly, recursively, or otherwise appropriate to the context.
	I can write an explicit symbolic function to describe real-world problems.
	I can write a recursive rule to describe patterns in contextual problems.
F.BF.1.b	I can combine standard function types using arithmetic operations.
	I can combine different parent functions, using the operations of addition, subtraction, multiplication, and division, to write a function that models a real-world context.
	I can justify the operations used in function combination in terms of real-world context.
	I can apply transformations to equations of parent funtions to model a contextual problem.
F.BF.3	I can determine the effect on the graph of replacing f(x) by f(x)+*k*, *k*f(x), f(*k*x), and f(x+*k*) for specific values of *k* (both positive and negative).
	I can determine the value of *k*, given a graph for slides, shifts, and stretches.
	I can identify transformations from an equation.
	I can use technology to generate examples of functions with different transformations and analyze the graphs to explain the impact that changing constants in equations will have on the graph of the function.

	I can identify transformations from a graph.
	I can explain the impact that changing constants in equations will have on the graph of the function.
	I can use transformations on parent functions to model relationships between two quantities.
	I can define even and odd functions.
	I can explain how to recognize even and odd functions from their graphs and algebraic expressions for them.
F.BF.4.a	I can determine the inverse of a linear function.
	I can solve a function, f(x), for the input value that yields a specific output c.
	I can find the inverse function for appropriate functions.
	I can explain the process of using an inverse as an operation that undoes another operation.
F.LE.4	I can solve exponential models using logarithms with base 2, 10, and e.
	I can solve simple exponential functions using logarithms.
	I can explain the difference between common logarithms and natural logarithms.
	I can convert between logarithmic and exponential forms.
	I can use the properties of logarithms to rewrite logarithmic expressions and solve equations.
	I can evaluate a logarithm using technology.
F.TF.1	I can define the radian measure of an angle.
	I can explain the definition of a radian with pictures and words.
	I can construct angles measuring one radian on a circle using a compass and straightedge.
F.TF.2	I can describe the importance of the unit circle for extending trigonometric functions to all real numbers and illustrate that extension with examples.
	I can explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers.
	I can write an angle in radian measure.
	I can explain what radian measure is in terms of a circle's radius.
	I can explain the difference between a positive and negative angle.
	I can provide examples of coterminal angles.
	I can label the unit circle in radians since it is known that one revolution of the unit circle is equal to 2pi radians.
	I can explain why coterminal angles will all produce the same output when evaluated as the inputs of a trigonometric function.
	I can solve triangles using trigonometric functions.
	I can identify the sine, cosine, and tangent of an angle using the unit circle.
F.TF.5	I can determine the trigonometric function that best models a situation based on period, amplitude, frequency, and midline.
	I can explain the connection between frequency and period.
	I can recognize sinusoidal curves from a scatterplot of data.
	I can find the period, amplitude, frequency, and midline of a trigonometric function given appropriate contextual information or points on a scatterplot.
	I can create trigonometric functions to model contextual situations.
F.TF.8	I can prove the Pythagorean Identity and use it to determine the sine, cosine, or tangent of an angle given sin(θ), cos(θ), or tan(θ) and the quadrant of the angle.
	I can derive the Pythagorean Identity by using the unit circle definitions of cosine and sine and applying the Pythagorean Theorem.
	I can use the quotient Identity tan(θ) = sin(θ)/cos(θ) to calculate tan(θ).

	I can explain how to use the Pythagorean Identity to determine values of trigonometric functions when given one trigonometric function and the quadrant of the angle.
S.ID.4	I can use the normal distribution to obtain the probability or likelihood of certain events.
	I can determine the mean and standard deviation of a data set and fit it to a normal distribution.
	I can determine when a data set warrants a normal distribution.
	I can estimate population percentages by estimating the areas under the normal curve using calculators, spreadsheets, and tables.
	I can use the Empirical Rule to estimate the likelihood of an event in a normal distribution that falls within 3 standard deviations of the mean.
	I can explain why fitting data to a normal distribution is appropriate for some data sets and not appropriate for others.
S.IC.1	I can define statistics in terms of inferences, population parameters, and random sampling.
	I can describe how statistics involves drawing conclusions about a population based on the results obtained from a random sample of a population.
	I can explain the need to use random sampling techniques.
	I can apply and compare different sampling techniques.
	I can explain how a sample statistic is an estimate of the population parameter.
S.IC.2	I can decide if a model is consistent with results, given a data-generating process such as simulation.
	I can choose a probability model for a problem situation.
	I can conduct a simulation of the model and determine which results are typical of the model and which results are considered outliers.
	I can use a sampling distribution to explain how unexpected results are possible.
S.IC.3	I can compare and contrast sample surveys, experiments, and observational studies while explaing how randomization relates to each.
	I can describe the purposes of sample surveys, experiments, and observational studies.
	I can describe the differences among sample surveys, experiments, and observational studies.
	I can explain the role of randomization in sample surveys, experiments, and observational studies.
S.IC.4	I can estimate a population mean or proportion given data from a sample survey and determine a margin of error using simulation models.
	I can calculate the sample mean or proportion.
	I can develop a margin of error using simulation models for random samples.
S.IC.5	I can compare two treatments using data from a randomized experiment and decide if differences are significant by using simulations.
	I can calculate the sample mean and standard deviation of two treatment groups and the difference of the means.
	I can conduct a simulation for each treatment group using the sample results as the parameters for the distributions.
	I can use the results of the simulation to create a confidence interval to determine if the parameters are significantly different based on the original difference of means.
S.IC.6	I can evaluate reports based on data.
	I can use tables, charts, and graphs to evaluate data.
	I can distinguish between categorical and quantitative data.
	I can determine the validity of claims based on data.
	I can use data to analyze decisions.

	I can determine whether or not sampling techniques were appropriate for the questions being researched.
	I can identify biases (personal or sampling) and flaws in sampling methods.
	I can provide justification for the analysis of good and bad reports.
S.MD.6+	I can analyze probabilities to make fair decisions.
	I can make arguments for fair decisions based on random number generation.
	I can use probability to create a method for making a fair decision.
	I can use probability to analyze the results of a process and decide if it resulted in a fair decision.
S.MD.7+	I can analyze decisions and strategies using probability concepts.
	I can analyze data to determine whether or not the best decision was made.
	I can analyze available strategies, recommend a strategy, and defend my choice with probability concepts.
	I can justify and critique arguments based on probability.
Key:	
Yellow Highlight = Critical Area	
Blue Font Color = Long Term Learning Goal	
Black Font Color = Short Term (possibly daily) learning target WITHOUT condition and criteria.	