| Jackson County Core Curriculum Collaborative (JC4) | |
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| Algebra 1 | |
| **Standard** | **Learning Targets in Student Friendly Language** |
| **N.RN.1** | I can describe the relationship between rational exponents and radicals. |
| | I can apply the properties of exponents to integer and rational exponents. |
| | I can define rational exponents as a convention used to represent radical notation. |
| | I can explain the properties of operations of rational exponents as an extension of the properties of integer exponents. |
| | I can explain how radical notation, rational exponents, and properties of integer exponents relate to one another. |
| **N.RN.2** | I can rewrite expressions that contain radicals and/or rational exponents using the properties of exponents. |
| | I can explain the meaning of rational exponents in terms of radicals and roots. |
| | I can translate fluently between radical and exponential forms. |
| **N.RN.3** | I can explain which operations are closed in the set of real numbers and its subsets of rational and irrational numbers. |
| | I can classify real numbers as rational or irrational. |
| | I can define closure with an operation, and apply closure to the addition of two rationals and two irrationals and multiplication of two rationals. |
| | I can explain why the sum of two rational numbers is rational. |
| | I can explain why the product of two rational numbers is rational. |
| | I can explain why the sum of a rational number and an irrational number is irrational. |
| | I can explain why the product of a nonzero rational and irrational number is irrational. |
| **N.Q.1** | I can choose, apply, and interpret the units for multi-step problems when using formulas, graphs, and other data displays. |
| | I can determine and explain my reasoning for choosing the correct units to be used with a given formula. |
| | I can explain why a specific scale was chosen for a graph. |
| | I can solve contextual and multi-step problems, and explain how units were used to understand the problems. |
| **N.Q.2** | I can determine the appropriate units and scale to model data. |
| | I can select and properly use an existing quantity for a real-world context. |
| | I can create an appropriate quantity for a real-world context. |
| | I can explain the meaning of different quantities in a problem and its solution. |
| **N.Q.3** | I can explain the importance of considering measurement error and variation when calculating and reporting solutions to contextual problems. |
| | I can record data to an appropriate level of accuracy when using different types of measuring devices (e.g. traditional ruler vs. electronic measuring device, stopwatch vs. clock). |
| | I can report calculated quantities using the same level of accuracy as used in the problem statement. |
| **ASSE.1.a** | I can interpret the parts of an expression that describes a real-world scenario, this includes the factors, coefficients, and terms. |
| | I can define an expression, term, factor, operation, coefficient, variable. |
| | I can interpret the real-world meaning of terms, factors, and coefficients of an expression in terms of their units. |
| **A.SSE.1.b** | I can use grouping strategies to interpret algebraic expressions that describe real-world scenarios. |

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| | I can group the parts of an expression differently in order to better interpret their meaning. |
| **A.SSE.2** | I can rewrite expressions using structure to identify important components of the expression. |
| | I can identify ways to rewrite expressions, such as difference of squares, factoring out a common monomial, regrouping, etc. |
| | I can identify various structures of expressions, such as an exponential monomial multiplied by a scalar of the same base, difference of squares in terms other than just x, etc. |
| | I can use the structure of an expression to identify ways to rewrite it. |
| | I can explain why equivalent expressions are equivalent. |
| **A.SSE.3.a** | I can factor a quadratic expression in order to reveal its zeros. |
| | I can factor a quadratic expression to produce an equivalent form of the original expression. |
| | I can explain the connection between the factored form of a quadratic expression and the zeros of the function it defines. |
| **A.SSE.3.b** | I can complete the square of a quadratic expression to reveal the maximum or minimum value of the function. |
| | I can complete the square on a quadratic expression to produce an equivalent form of the original expression. |
| | I can identify the maximum or minimum of a quadratic written in vertex form. |
| **A.SSE.3.c** | I can use the properties of exponents to transform exponential functions to reveal properties of the quantity represented by the expression. |
| | I can rewrite exponential functions using the properties of exponents. |
| | I can identify exponential growth and decay from an exponential expression. |
| **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 polynomial to explain why polynomials are closed under the operations of addition, subtraction, and multiplication. |
| **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 identify the variables and quantities represented in a real-world problem. |
| | I can determine the best model for the real-world problem. |
| | I can create linear, quadratic or exponential equations and inequalities for real-world problems. |
| | 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 from among linear, quadratic, and exponential functions, as appropriate for modeling a situation. |
| | I can create an equation, inequality, or system to model a situation with two variables. |

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| | 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, provided in the modeling context. |
| | I can use contexts to determine constraints for equations and inequalities. |
| | I can use contexts to determine 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. |
| **A.CED.4** | I can solve formulas for a particular variable of interest. |
| | I can explain the steps used to rearrange a formula to highlight a variable of interest. |
| **A.REI.1** | I can explain and justify each step for solving multi-step linear equations. |
| | I can justify solutions to equations by explaining each step in solving a simple equation using the properties of equality. |
| | I can explain why, when solving equations, it is assumed that the original equation is true. |
| | I can apply order of operations and inverse operations to solve equations. |
| **A.REI.3** | I can solve multi-step linear equations and inequalities in one variable including those with coefficients represented by letters. |
| | I can solve multi-step equations and inequalities in one variable. |
| | I can solve multi-step equations and inequalities in one variable with coefficients represented by letters. |
| | I can explain why the inequality symbol is reversed when multiplying/dividing both sides of the inequality by a negative number. |
| **A.REI.4.a** | I can use the method of completing the square to solve quadratic equations and to derive the quadratic formula. |
| | I can solve single variable quadratic equations by completing the square. |
| | I can derive the quadratic formula by completing the square on a generalized quadratic equation in terms of x. |
| **A.REI.4.b** | I can find the real solutions to quadratic equations in one variable using multiple methods and justify my solution method. (square roots, completing the square, quadratic formula and factoring) |
| | I can justify the appropriate strategies to solve quadratic equations given the initial form of the equation. |
| | I can solve single variable quadratic equations by inspection and taking the square roots. |
| | I can solve single variable quadratic equations by using the quadratic formula. |
| | I can solve single variable quadratic equations by factoring. |
| | I can determine when the quadratic formula gives complex solutions. |
| **A.REI.5** | I can justify the method of linear combination when solving a system of two equations in two variables. |
| | I can solve a system of two equations in two variables using the method of linear combination. |
| | I can explain why the method of linear combination produces a simpler equivalent system with the same solution as the original. |
| **A.REI.6** | I can write, solve, interpret, and justify my solution method for systems of linear equations using multiple methods (linear combination, substitution, and graphing). |
| | I can solve a system of equations by graphing both equations on a coordinate plane and finding their point of intersection. |
| | I can solve a system of equations algebraically, by substitution and linear combination. |

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| | I can justify the method used to solve systems of linear equations given the initial forms of the equations or problem context. |
| | I can explain why some linear systems have no solutions. |
| | I can explain why some linear systems have infinitely many solutions. |
| **A.REI.7** | I can solve a system of equations consisting of a linear equation and quadratic equation algebraically and graphically. |
| | I can solve a system consisting of a linear equation and a quadratic equation graphically. |
| | I can solve a simple system consisting of a linear equation and a quadratic equation algebraically. |
| | I can demonstrate on a graph when a system consisting of a linear and a quadratic equation has no solution, one solution, or two solutions. |
| **A.REI.10** | I can explain that the graph of an equation in two variables is the set of all its solutions. |
| | I can explain that every point (x,y) on the graph of an equation represents values x and y that make the equation true. |
| **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 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). |
| | I can use a graphing calculator, table of values or successive approximations to determine the approximate solutions to a system of equations. |
| **A.REI.12** | I can describe and interpret the solutions to a system of linear inequalities graphically. |
| | I can solve problems involving a single linear inequality graphically. |
| | I can describe the characteristics of a linear inequality and system of linear inequalities, such as the boundary line and shading of the appropriate half-plane. |
| | I can solve a system of linear inequalities in two variables through graphing. |
| | I can explain the meaning of the intersection of the shaded regions in a system of linear inequalities. |
| **F.IF.1** | I can define a function as a rule that assigns to each element of its domain exactly one element in its range, and use appropriate function notation algebraically and graphically. |
| | I can represent a function using a graph, table, and equation and describe the relationship between each form using function notation. |
| | I can explain how a function represents a set of pairs that maps each element of the domain (set of inputs) with one unique element of the range (set of outputs). |
| | I can determine if a relation is a function by applying the definition of functions. |
| | I can explain that f is a function such that x is an element of its domain and f(x) denotes an element of its range. f(2) = 8 means that x=2 is an element of the domain while 8 is an element of the range paired with 2. |
| | I can explain that the graph of f is the graph of the equation y=f(x). |
| **F.IF.2** | I can interpret statements that use function notation in terms of a context and evaluate functions for inputs in their domains. |
| | I can flexibly use different ways to describe functions including y= and f(x)= notations, graphs, and tables. |
| | I can evaluate a function for a given input in the domain, as given in function notation. |
| | I can interpret the meaning of function notation given a context. |

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| | I can identify mathematical relationships in tables, graphs and ordered pairs, and express them using function notation. |
| **F.IF.3** | I can explain how sequences are functions whose domain is a subset of the integers by using different represenational notation. |
| | I can write the specified terms for a sequence defined explicitly and recursively. |
| | I can find an explicit or recursive rule for a sequence. |
| | I can write out terms of a sequence using function notation. |
| **F.IF.4** | I can interpret key features of graphs and tables for a function that models a relationship between two quantities. (Key features include: intercepts; intervals where function is increasing, decreasing, positive, negative; relative maximums and minimums; symmetries; and end behavior.) |
| | I can define and recognize the key features in tables and graphs of functions: intercepts, intervals where the function is increasing, decreasing, positive, or negative, and end behavior. |
| | I can interpret the key features of graphs and tables of functions in terms of the context the function's quantities represent. |
| | I can sketch a graph showing the key features of a function. |
| **F.IF.5** | I can determine the appropriate domain of a function given its real-world context. (linear, quadratic, exponential) |
| | I can explain how the domain of a function is represented in its graph, such that it represents a situation in a context. |
| | I can determine what the domain for a function should be and create a graph that displays it. |
| | 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 as well as estimate this rate given a graph. |
| | I can explain the connection between average rate of change and the slope formula. |
| | 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, and end behavior. |
| **F.IF.7.b** | I can graph piecewise-defined functions such as step functions and absolute value 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 its component parts. |
| | I can explain how to find the vertex of an absolute value function. |
| | I can use symmetry when generating ordered pairs for an absolute value function. |

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| | I can graph an absolute value function using evaluated points, symmetry, or transformations of the parent function. |
| **F.IF.7.e** | I can graph exponential functions that are expressed symbolically and show their intercepts and end behavior. |
| | I can graph exponential functions, when expressed symbolically, by hand in simple cases and by using technology in complicated cases. |
| | I can show/label intercepts and describe the exponential functions end behavior. |
| **F.IF.8.a** | I can manipulate a quadratic expression by factoring and completing the square to find and interpret a quadratic functions 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 properties of two functions when they are represented in different forms (algebraically, graphically, tables as well as verbal descriptions). |
| **F.BF.1.a** | I can discover patterns in contextual problems and sets of ordered pairs to create verbal, recursive, or explicit symbolic rules that describe them. |
| | 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 different families of functions using arithmetic operations to build functions that describe situational contexts. |
| | 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.2** | I can translate between the recursive and explicit formulas of arithmetic and geometric sequences and use them to model situations. |
| | I can explain what a recursive formula tells about a sequence. |
| | I can explain what an explicit formula tells about a sequence. |
| | I can distinguish between recursive and explicit formulas for a sequence. |
| | I can distinguish between arithmetic and geometric sequences by finding a common difference or ratio. |
| | I can explain why the recursive formula for an arithmetic sequence uses addition and why the explicit formula uses multiplication. |
| | I can explain why the recursive formula for a geometric sequence uses multiplication and why the explicit formula uses exponentiation. |
| | I can write arithmetic sequences in recursive and explicit forms. |
| | I can write geometric sequences in recursive and explicit forms. |

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| | I can translate between recursive and explicit forms of arithmetic/geometric sequence formulas. |
| | I can use arithmetic and geometric formulas to model situations. |
| **F.BF.3** | I can experiment and identify the effect of a transformational constant on a function. |
| | I can use ordered pairs or algebraic reasoning to explain why f(x) + k translates the graph of f(x) vertically. |
| | I can use ordered pairs or algebraic reasoning to explain why f(x+k) translates the graph of f(x) horizontally. |
| | I can use ordered pairs or algebraic reasoning to explain why kf(x) vertically stretches or shrinks the graph of f(x) by a factor of k. |
| | I can use ordered pairs or algebraic reasoning to explain why f(kx) horizontally stretches or shrinks the graph of f(x) by a factor of 1/k. |
| | I can describe the transformation that changes a graph of f(x) into a different graph when given pictures of the pre-image and image. |
| **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.1.a** | I can prove that, over equal intervals, linear functions grow by equal differences and exponential functions grow by equal factors. |
| | I can identify that linear functions grow by equal differences over equal intervals. |
| | I can identify that exponential functions grow by equal factors over equal intervals. |
| | I can prove that linear functions grow by equal differences over equal intervals. |
| | I can prove that exponential functions grow by equal factors over equal intervals. |
| **F.LE.1.b** | I can analyze a given context to determine if it can be modeled with a linear function. |
| | I can recognize situations that display equal rates of change over equal intervals and can be modeled by a linear function. |
| | I can justify choosing a linear function to model a real-world problem. |
| **F.LE.1.c** | I can analyze a given context to determine if it can be modeled with an exponential function. |
| | I can recognize situations that display equal ratios of change over equal intervals and can be modeled with exponential functions. |
| | I can justify choosing an exponential function to model a real-world problem. |
| **F.LE.2** | I can create linear and exponential functions, including arithmetic and geometric sequences, based on information from multiple non-symbolic representations. |
| | I can determine if a function is linear or exponential given a sequence, a graph, a verbal description, or a table. |
| | I can construct linear functions given an arithmetic sequence, graph, verbal description, and/or table of data. |
| | I can construct exponential functions given a geometric sequence, graph, verbal description, and/or table of data. |
| **F.LE.3** | Using graphs and tables I can determine a generalization for which functions grow the fastest. |
| | I can use graphs or tables to compare the output values of linear, quadratic, and exponential functions. |
| | I can explain why exponential functions eventually exceeds a quantity increasing linearly, quadratically, or polynomial functions in general. |
| | I can use graphs or tables to compare the rates of change of linear, quadratic, and exponential functions. |

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| **F.LE.5** | I can interpret the parameters in linear and exponential function models, in terms of their contexts. |
| | I can explain the slope and y-intercept in context for a linear model. |
| | I can explain the meaning of the base, the exponent, and the coefficient in context for an exponential model. |
| | I can compose an original problem situation and construct a linear function to model it. |
| | I can compose an original problem situation and construct an exponential function to model it. |
| **S.ID.1** | I can represent data with dot plots, histograms, and box plots. |
| | I can create a dot plot, using appropriate scales on a number line. |
| | I can construct a histogram using an appropriate bin size. |
| | I can explain what the display is telling the viewer in the context of the situation. |
| | I can explain how extreme cases can be represented based on the display type. |
| | I can compute the 5-number summary for a set of data. |
| | I can construct a box plot based on the 5-number summary. |
| **S.ID.2** | I can compare the center (mean and median) and spread (interquartile range and standard deviation) of two or more data sets based on the shape of the data distribution. |
| | I can identify a data distribution as uniform, skewed left, normal, or skewed right. |
| | I can choose the appropriate measure for the center of a data set based on the shape of a data distribution. |
| | I can choose the appropriate measure for the spread of a data set based on the shape of a data distribution. |
| | I can use appropriate statistics for center and spread to compare two or more data sets. |
| **S.ID.3** | I can interpret differences in shape, center, and spread based on the context of the data set and determine possible effects of outliers on these measures. |
| | I can identify outliers of a data set. |
| | I can explain how extreme values or skewness can effect the mean of a data set. |
| | I can explain which measures of center and spread are appropriate when given certain distributional characteristics. |
| | I can describe the possible effects the presence of outliers in a set of data can have on shape, center, and spread in the context of the data sets. |
| | I can interpret differences in shape, center and spread in the context of data sets. |
| **S.ID.5** | I can summarize, represent, and interpret (joint, marginal, and conditional relative frequencies) categorical data in two-way frequency tables. |
| | I can summarize categorical data for two categories in two-way frequency tables. |
| | I can calculate joint, marginal, and conditional relative frequencies for two categories of categorical data. |
| | I can interpret relative frequencies in the context of the data. |
| | I can recognize possible associations and trends in the data. |
| **S.ID.6.a** | I can fit a function to quantitative data represented on a scatter plot and describe how the variables are related in the context of the data. |
| | I can describe how variables are related within context of the situation. |
| | I can use technology to create a Line of Best Fit for a given set of bivariate data. |
| | I can fit a linear function to a given scatter plot that suggests a linear association. |
| | I can describe associations in terms of strength and direction. |
| | I can explain the limitations of extrapolation for different models. |
| **S.ID.6.b** | I can determine the appropriateness of a model by analyzing a residual plot. |
| | I can compute the residuals for a set of data and the function of best fit. |

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| | I can construct a scatter plot of the residuals. |
| | I can analyze the residual plot to determine whether the function is an appropriate fit to a set of data. |
| **S.ID.6.c** | I can fit a linear funtion to a scatter plot that suggests a linear association. |
| | I can fit a linear function to a given scatter plot that suggests a linear expression. |
| | I can make an argument why one line of fit is more appropriate than another. |
| **S.ID.7** | I can interpret the slope and intercept of a linear model based on context. |
| | I can interpret the slope of a linear model in terms of averages for the context of given data. |
| | I can interpret the intercepts of a linear model, if appropriate, in the context of given data. |
| **S.ID.8** | I can compute and interpret the correlation coefficient of a linear fit. |
| | I can define the correlation coefficient. |
| | I can compute, using technology, the correlation coefficient of a linear fit. |
| | I can interpret the correlation coefficient of a linear fit as a measure of how well the data fit the relationship. |
| **S.ID.9** | I can describe the difference between correlation and causation. |
| | I can explain the difference between correlation and causation. |
| | I can determine if statements of causation seem reasonable or unreasonable and defend my opinion. |
| **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.** | |