Algebra

Purpose

Students will become flexible thinkers and complex problem solvers by applying essential mathematical ideas and concepts through a rigorous, focused, and relevant curriculum.

Philosophy Statement

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Algebra

Statement	Exceeds	Secure	Developing	Beginning
Solves equations and inequalities.	Create and solve real world multi-step equations and inequalities in one variable.	Solve an equation or inequality with the distributive property, variables on each side, and fractions.	Solves equations and inequalities with variables on both sides of the equation or inequality.	Solves two-step equations and inequalities in one variable.
Verifies functions and applies function notation.	Creates a function that defines a sequence.	Applies function notation, evaluates functions for input and interprets statements that use function notation in terms of a context.	Relates input/output to domain and range and y to function notation f(x).	Determines that a function is a rule that assigns to each input exactly one output and that y=mx+b defines a linear function whose graph is a straight line.
Represents and solves equations and inequalities graphically.	Interprets graphs of real world applications and creates the equation or inequality that defines the data.	Graphs a linear inequality and interprets the solutions as points on the line and points above or below the line.	Creates an input/output table for polynomial, rational, absolute value, exponential and logarithmic functions.	Creates an input/output table for linear equations and plot points to create graph on coordinate plane.
Creates and interprets functions to model relationships.	Models and interprets a real world problem that requires creating functions and using technology.	Creates a function to model a linear relationship in two variables. Sketches graphs and relates domain to the graph.	Determines rate of change graphically and algebraically.	Describes the relationship between two quantities from a graph and sketches graphs given a description of the relationship.

Analyzes and solves systems of linear equations.	Creates and solves a system of equations with three variables or more than two equations.	Applies linear systems to real world applications.	Solves linear systems by graphing, substitution and elimination.	Identifies and proves the solution of a linear system.
Constructs equations that describe numbers or relationships.	Creates own real-world linear programming application and uses technology to represent results.	Creates a system of equations or inequalities to represent relationships (linear programming).	Creates equations in 1 or 2 variables including linear, quadratic, rational, and exponential functions.	Creates equations and inequalities in one variable.
Applies the properties of exponents to rational exponents.	Creates and solves exponential expressions involving radical and rational exponents.	Applies properties of exponents to expressions involving radicals and rational exponents.	Applies integer exponents to variables and numbers.	Applies positive integer exponents to variables and numbers.
Constructs and compares linear and exponential models and solve problems.	Constructs and compares linear, quadratic, and exponential models and solve problems.	Writes linear and exponential models (including arithmetic and geometric sequences) given a description of the relationship or input-output pairs.	Writes linear and exponential models given the graph of the function.	Distinguish between linear and exponential models by interpreting rates of change along the graph.
Summarizes, represents, and interprets linear and exponential models for data.	Writes and interprets quadratic functions for data using technology.	Writes and interprets exponential functions for data using technology.	Writes and interprets linear functions for data. Applies the function to predict results.	Plots data and recognizes possible associations and trends in the data

Builds a function that models a relationship between two quantities.	Builds new functions from existing functions including simple, radical, rational, exponential, and quadratic.	Writes arithmetic and geometric sequences recursively and with an explicit expression to model situations.	Writes an exponential function relating two quantities recursively and with an explicit expression.	Writes a linear function relating two quantities recursively and with an explicit expression.
Writes expressions in equivalent forms to solve problems.	Interpret a real world problem using an exponential / quadratic function. (i.e. thrown object model)	Factors a quadratic expression in the form of ax^2+bx+c.	Factors a quadratic expression in the form of x^2+bx+c.	Finds solutions to quadratic expression using zero product property.
Analyzes functions using different representations.	Analyzes real world data and fits the data to the appropriate function.	Compares exponential and logarithmic functions graphically, showing intercepts, end behavior, algebraically, numerically in a table and verbally.	Compares two quadratic functions graphically by showing x - intercepts and maxima and minima, algebraically, numerically in a table, and verbally.	Compares two linear functions graphically by showing x and y intercepts, numerically in a table and verbally.

The asterisk (*) denotes one possible way a student could demonstrate enrichment or extension that would be designated as Exceeds Standard.