Algebra I | Mathematics Standards of Learning for Virginia Public Schools (2023) Correlation to *Eureka Math²® (2027)*

Eureka Math² is a research-proven math curriculum that empowers teachers to center instructional techniques on student success. Teachers can foster more "aha!" learning moments by providing the support needed for all learners to build a more confident math mindset.

This *Eureka Math²* edition builds on a strong foundation of effective instruction. It provides teachers with guidance on delivering rigorous instruction that honors student choice and encourages confident problem-solving.

Eureka Math² carefully sequences mathematical content to maximize vertical alignment from kindergarten through high school. This kind of sequencing has proven to be essential in students' mastery of math.

Teachability

Eureka Math² employs streamlined materials that allow teachers to plan more efficiently and focus their energy on delivering high-quality instruction that meets the individual needs of their students. Differentiation suggestions, slide decks, digital interactives, and multiple forms of assessment are just a few of the resources built into the teacher materials.

Accessibility

Eureka Math² incorporates Universal Design for Learning (UDL) principles so all learners can access the mathematics and take on challenging math concepts. UDL, Differentiation, and Multilingual Learner supports are built into the instructional design and are clearly identified in the *Teach* book.

The curriculum also carries a focus on readability. By eliminating unnecessary words and using clear sentences, the *Eureka Math²* teacher–writers have created one of the most readable mathematics curricula on the market. The curriculum's readability and accessibility help all students see themselves as mathematical thinkers and doers who are fully capable of owning their mathematics learning.

Math Confidence

Eureka Math² fosters a classroom culture of learning by encouraging student-led discourse and cognitive engagement that results in confident learners. By leveraging consistent models, routines, and progressions, teachers can remove barriers and allow all students an avenue to success. Within the digital platform, each grade includes wordless videos and digital interactives that spark students' curiosity and help them make conceptual connections. Using the *Learn* books, students wonder, explore, and make sense of mathematics, which helps them develop a strong, positive mathematical identity.

Mathematical Process Goals for Students	Aligned Components of *Eureka Math²*
Mathematical Problem Solving	Lessons in every module engage students in mathematical processes. These are indicated in margin notes included with every lesson.
Mathematical Communication	Lessons in every module engage students in mathematical processes. These are indicated in margin notes included with every lesson.
Mathematical Reasoning	Lessons in every module engage students in mathematical processes. These are indicated in margin notes included with every lesson.
Mathematical Connections	Lessons in every module engage students in mathematical processes. These are indicated in margin notes included with every lesson.
Mathematical Representations	Lessons in every module engage students in mathematical processes. These are indicated in margin notes included with every lesson.

Expressions and Operations

A.EO.1 The student will represent verbal quantitative situations algebraically and evaluate these expressions for given replacement values of the variables.

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math²*
A.EO.1.a Translate between verbal quantitative situations and algebraic expressions, including contextual situations.	A1 M1 Lesson 1: The Growing Pattern of Ducks A1 M1 Lesson 7: Printing Presses A1 M1 Lesson 11: Writing and Solving Equations in One Variable A1 M4 Lesson 9: Creating and Solving Quadratic Equations in One Variable
A.EO.1.b Evaluate algebraic expressions which include absolute value, square roots, and cube roots for given replacement values to include rational numbers, without rationalizing the denominator.	*Supplemental material is necessary to address this standard.*

Expressions and Operations

A.EO.2 The student will perform operations on and factor polynomial expressions in one variable.

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math²*
A.EO.2.a Determine sums and differences of polynomial expressions in one variable, using a variety of strategies, including concrete objects and their related pictorial and symbolic models.	A1 M1 Lesson 3: Polynomial Expressions A1 M1 Lesson 4: Adding and Subtracting Polynomial Expressions *Supplemental material is necessary to address using concrete objects and pictorial models.*

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math²*
A.EO.2.b Determine the product of polynomial expressions in one variable, using a variety of strategies, including concrete objects and their related pictorial and symbolic models, the application of the distributive property, and the use of area models. The factors should be limited to five or fewer terms (e.g., $(4x + 2)(3x + 5)$ represents four terms and $(x + 1)(2x^2 + x + 3)$ represents five terms).	A1 M1 Lesson 5: Multiplying Polynomial Expressions A1 M1 Lesson 6: Polynomial Identities
A.EO.2.c Factor completely first- and second-degree polynomials in one variable with integral coefficients. After factoring out the greatest common factor (GCF), leading coefficients should have no more than four factors.	A1 M1 Lesson 2: The Commutative, Associative, and Distributive Properties A1 M4 Lesson 5: Solving Equations That Contain Factored Expressions A1 M4 Lesson 6: Solving Quadratic Equations by Factoring: Identities and Guess and Check A1 M4 Lesson 7: Solving Quadratic Equations by Factoring: Splitting the Linear Term A1 M4 Lesson 8: A Summary of Solving Quadratic Equations by Factoring A1 M4 Lesson 9: Creating and Solving Quadratic Equations in One Variable A1 M4 Lesson 10: Zeros of Functions A1 M4 Lesson 11: Graphing Quadratic Functions from Factored Form A1 M4 Lesson 12: Using Symmetry to Graph Quadratic Functions from Standard Form
A.EO.2.d Determine the quotient of polynomials, using a monomial or binomial divisor, or a completely factored divisor.	*Supplemental material is necessary to address this standard.*

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math²*
A.EO.2.e Represent and demonstrate equality of quadratic expressions in different forms (e.g., concrete, verbal, symbolic, and graphical).	A1 M1 Lesson 1: The Growing Pattern of Ducks A1 M4 Lesson 5: Solving Equations That Contain Factored Expressions A1 M4 Lesson 6: Solving Quadratic Equations by Factoring: Identities and Guess and Check A1 M4 Lesson 7: Solving Quadratic Equations by Factoring: Splitting the Linear Term A1 M4 Lesson 8: A Summary of Solving Quadratic Equations by Factoring A1 M4 Lesson 9: Creating and Solving Quadratic Equations in One Variable A1 M4 Lesson 10: Zeros of Functions A1 M4 Lesson 11: Graphing Quadratic Functions from Factored Form A1 M4 Lesson 12: Using Symmetry to Graph Quadratic Functions from Standard Form A1 M4 Lesson 21: Completing the Square to Graph Quadratic Functions A1 M4 Lesson 22: A Summary of Graphing Quadratic Functions

Expressions and Operations

A.EO.3 The student will derive and apply the laws of exponents.

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math²*
A.EO.3.a Derive the laws of exponents through explorations of patterns, to include products, quotients, and powers of bases.	8 M1 Lesson 5: Products of Exponential Expressions with Whole Number Exponents 8 M1 Lesson 6: More Properties of Exponents 8 M1 Lesson 7: Making Sense of the Exponent of 0 8 M1 Lesson 8: Making Sense of Integer Exponents 8 M1 Lesson 9: Writing Equivalent Expressions 8 M1 Lesson 10: Evaluating Numerical Expressions by Using Properties of Exponents
A.EO.3.b Simplify multivariable expressions and ratios of monomial expressions in which the exponents are integers, using the laws of exponents.	8 M1 Lesson 5: Products of Exponential Expressions with Whole Number Exponents 8 M1 Lesson 6: More Properties of Exponents 8 M1 Lesson 7: Making Sense of the Exponent of 0 8 M1 Lesson 8: Making Sense of Integer Exponents 8 M1 Lesson 9: Writing Equivalent Expressions 8 M1 Lesson 10: Evaluating Numerical Expressions by Using Properties of Exponents *Supplemental material is necessary to fully address simplifying multivariable expressions.*

Expressions and Operations

A.EO.4 The student will simplify and determine equivalent radical expressions involving square roots of whole numbers and cube roots of integers.

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math²*
A.EO.4.a Simplify and determine equivalent radical expressions involving the square root of a whole number in simplest form.	A1 M4 Lesson 17: Rewriting Square Roots
A.EO.4.b Simplify and determine equivalent radical expressions involving the cube root of an integer.	*Supplemental material is necessary to address this standard.*
A.EO.4.c Add, subtract, and multiply radicals, limited to numeric square and cube root expressions.	A1 M4 Lesson 17: Rewriting Square Roots *Supplemental material is necessary to fully address this standard.*
A.EO.4.d Generate equivalent numerical expressions and justify their equivalency for radicals using rational exponents, limited to rational exponents of $\frac{1}{2}$ and $\frac{1}{3}$ (e.g., $\sqrt{5} = 5^{\frac{1}{2}}$; $\sqrt[3]{8} = 8^{\frac{1}{3}} = (2^3)^{\frac{1}{3}} = 2$).	A1 M5 Lesson 9: Unit Fraction Exponents

Equations and Inequalities

A.EI.1 The student will represent, solve, explain, and interpret the solution to multistep linear equations and inequalities in one variable and literal equations for a specified variable.

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math²*
A.EI.1.a Write a linear equation or inequality in one variable to represent a contextual situation.	A1 M1 Lesson 7: Printing Presses A1 M1 Lesson 8: Solution Sets for Equations and Inequalities in One Variable A1 M1 Lesson 9: Solving Linear Equations in One Variable A1 M1 Lesson 10: Some Potential Dangers When Solving Equations A1 M1 Lesson 11: Writing and Solving Equations in One Variable A1 M1 Lesson 13: Solving Linear Inequalities in One Variable A1 M1 Lesson 15: Solving and Graphing Compound Inequalities A1 M1 Lesson 17: Solving Absolute Value Inequalities
A.EI.1.b Solve multistep linear equations in one variable, including those in contextual situations, by applying the properties of real numbers and/or properties of equality.	A1 M1 Lesson 7: Printing Presses A1 M1 Lesson 8: Solution Sets for Equations and Inequalities in One Variable A1 M1 Lesson 9: Solving Linear Equations in One Variable A1 M1 Lesson 10: Some Potential Dangers When Solving Equations A1 M1 Lesson 11: Writing and Solving Equations in One Variable A1 M1 Lesson 16: Solving Absolute Value Equations
A.EI.1.c Solve multistep linear inequalities in one variable algebraically and graph the solution set on a number line, including those in contextual situations, by applying the properties of real numbers and/or properties of inequality.	A1 M1 Lesson 13: Solving Linear Inequalities in One Variable A1 M1 Lesson 14: Solution Sets of Compound Statements A1 M1 Lesson 15: Solving and Graphing Compound Inequalities A1 M1 Lesson 16: Solving Absolute Value Equations A1 M1 Lesson 17: Solving Absolute Value Inequalities A1 M1 Lesson 18: Applying Absolute Value

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math²*
A.EI.1.d Rearrange a formula or literal equation to solve for a specified variable by applying the properties of equality.	A1 M1 Lesson 12: Rearranging Formulas
A.EI.1.e Determine if a linear equation in one variable has one solution, no solution, or an infinite number of solutions.	A1 M1 Lesson 7: Printing Presses A1 M1 Lesson 8: Solution Sets for Equations and Inequalities in One Variable A1 M1 Lesson 9: Solving Linear Equations in One Variable A1 M1 Lesson 10: Some Potential Dangers When Solving Equations A1 M1 Lesson 11: Writing and Solving Equations in One Variable
A.EI.1.f Verify possible solution(s) to multistep linear equations and inequalities in one variable algebraically, graphically, and with technology to justify the reasonableness of the answer(s). Explain the solution method and interpret solutions for problems given in context.	A1 M1 Lesson 7: Printing Presses A1 M1 Lesson 8: Solution Sets for Equations and Inequalities in One Variable A1 M1 Lesson 9: Solving Linear Equations in One Variable A1 M1 Lesson 10: Some Potential Dangers When Solving Equations A1 M1 Lesson 11: Writing and Solving Equations in One Variable *Supplemental material is necessary to address verifying possible solutions with technology.*

Equations and Inequalities

A.EI.2 The student will represent, solve, explain, and interpret the solution to a system of two linear equations, a linear inequality in two variables, or a system of two linear inequalities in two variables.

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math²*
A.EI.2.a Create a system of two linear equations in two variables to represent a contextual situation.	A1 M2 Lesson 7: Low-Flow Showerhead A1 M2 Lesson 11: Applications of Systems of Equations
A.EI.2.b Apply the properties of real numbers and/or properties of equality to solve a system of two linear equations in two variables, algebraically and graphically.	A1 M2 Lesson 7: Low-Flow Showerhead A1 M2 Lesson 8: Systems of Linear Equations in Two Variables A1 M2 Lesson 9: A New Way to Solve Systems A1 M2 Lesson 10: The Elimination Method A1 M2 Lesson 11: Applications of Systems of Equations
A.EI.2.c Determine whether a system of two linear equations has one solution, no solution, or an infinite number of solutions.	A1 M2 Lesson 8: Systems of Linear Equations in Two Variables A1 M2 Lesson 9: A New Way to Solve Systems A1 M2 Lesson 10: The Elimination Method A1 M2 Lesson 11: Applications of Systems of Equations
A.EI.2.d Create a linear inequality in two variables to represent a contextual situation.	A1 M2 Lesson 4: Solution Sets of Linear Inequalities in Two Variables A1 M2 Lesson 6: Applications of Linear Equations and Inequalities
A.EI.2.e Represent the solution of a linear inequality in two variables graphically on a coordinate plane.	A1 M2 Lesson 4: Solution Sets of Linear Inequalities in Two Variables A1 M2 Lesson 5: Graphing Linear Inequalities in Two Variables A1 M2 Lesson 6: Applications of Linear Equations and Inequalities

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math²*
A.EI.2.f Create a system of two linear inequalities in two variables to represent a contextual situation.	A1 M2 Lesson 12: Solution Sets of Systems of Linear Inequalities A1 M2 Lesson 13: Graphing Solution Sets of Systems of Linear Inequalities A1 M2 Lesson 14: Applications of Systems of Linear Inequalities A1 M6 Lesson 6: Designing a Fundraiser
A.EI.2.g Represent the solution set of a system of two linear inequalities in two variables, graphically on a coordinate plane.	A1 M2 Lesson 12: Solution Sets of Systems of Linear Inequalities A1 M2 Lesson 13: Graphing Solution Sets of Systems of Linear Inequalities A1 M2 Lesson 14: Applications of Systems of Linear Inequalities A1 M6 Lesson 6: Designing a Fundraiser
A.EI.2.h Verify possible solution(s) to a system of two linear equations, a linear inequality in two variables, or a system of two linear inequalities algebraically, graphically, and with technology to justify the reasonableness of the answer(s). Explain the solution method and interpret solutions for problems given in context.	A1 M2 Lesson 4: Solution Sets of Linear Inequalities in Two Variables A1 M2 Lesson 5: Graphing Linear Inequalities in Two Variables A1 M2 Lesson 7: Low-Flow Showerhead A1 M2 Lesson 8: Systems of Linear Equations in Two Variables A1 M2 Lesson 9: A New Way to Solve Systems A1 M2 Lesson 10: The Elimination Method A1 M2 Lesson 11: Applications of Systems of Equations A1 M2 Lesson 12: Solution Sets of Systems of Linear Inequalities A1 M2 Lesson 13: Graphing Solution Sets of Systems of Linear Inequalities A1 M2 Lesson 14: Applications of Systems of Linear Inequalities A1 M6 Lesson 6: Designing a Fundraiser

Equations and Inequalities

A.EI.3 The student will represent, solve, and interpret the solution to a quadratic equation in one variable.

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math²*
A.EI.3.a Solve a quadratic equation in one variable over the set of real numbers with rational or irrational solutions, including those that can be used to solve contextual problems.	A1 M4 Lesson 5: Solving Equations That Contain Factored Expressions A1 M4 Lesson 6: Solving Quadratic Equations by Factoring: Identities and Guess and Check A1 M4 Lesson 7: Solving Quadratic Equations by Factoring: Splitting the Linear Term A1 M4 Lesson 8: A Summary of Solving Quadratic Equations by Factoring A1 M4 Lesson 9: Creating and Solving Quadratic Equations in One Variable A1 M4 Lesson 13: Using Square Roots to Solve Quadratic Equations A1 M4 Lesson 14: Solving Quadratic Equations by Completing the Square A1 M4 Lesson 15: Deriving the Quadratic Formula A1 M4 Lesson 16: Solving Quadratic Equations A1 M4 Lesson 18: The Quadratic Formula and Zeros of a Function
A.EI.3.b Determine and justify if a quadratic equation in one variable has no real solutions, one real solution, or two real solutions.	A1 M4 Lesson 16: Solving Quadratic Equations A1 M4 Lesson 18: The Quadratic Formula and Zeros of a Function

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math²*
A.EI.3.c Verify possible solution(s) to a quadratic equation in one variable algebraically, graphically, and with technology to justify the reasonableness of answer(s). Explain the solution method and interpret solutions for problems given in context.	A1 M4 Lesson 5: Solving Equations That Contain Factored Expressions A1 M4 Lesson 6: Solving Quadratic Equations by Factoring: Identities and Guess and Check A1 M4 Lesson 7: Solving Quadratic Equations by Factoring: Splitting the Linear Term A1 M4 Lesson 8: A Summary of Solving Quadratic Equations by Factoring A1 M4 Lesson 9: Creating and Solving Quadratic Equations in One Variable A1 M4 Lesson 13: Using Square Roots to Solve Quadratic Equations A1 M4 Lesson 14: Solving Quadratic Equations by Completing the Square A1 M4 Lesson 16: Solving Quadratic Equations A1 M4 Lesson 18: The Quadratic Formula and Zeros of a Function *Supplemental material is necessary to address verifying possible solutions with technology.*

Functions

A.F.1 The student will investigate, analyze, and compare linear functions algebraically and graphically, and model linear relationships.

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math²*
A.F.1.a Determine and identify the domain, range, zeros, slope, and intercepts of a linear function, presented algebraically or graphically, including the interpretation of these characteristics in contextual situations.	A1 M2 Lesson 1: Solution Sets of Linear Equations in Two Variables A1 M2 Lesson 2: Graphing Linear Equations in Two Variables A1 M2 Lesson 3: Creating Linear Equations in Two Variables A1 M2 Lesson 6: Applications of Linear Equations and Inequalities A1 M3 Lesson 8: Exploring Key Features of a Function and Its Graph A1 M3 Lesson 11: Using Graphs to Solve Equations
A.F.1.b Investigate and explain how transformations to the parent function $y = x$ affect the rate of change (slope) and the y-intercept of a linear function.	A1 M3 Lesson 21: Building New Functions—Reflections *Supplemental material is necessary to fully address this standard.*
A.F.1.c Write equivalent algebraic forms of linear functions, including slope-intercept form, standard form, and point-slope form, and analyze and interpret the information revealed by each form.	A1 M2 Lesson 1: Solution Sets of Linear Equations in Two Variables A1 M2 Lesson 2: Graphing Linear Equations in Two Variables A1 M2 Lesson 3: Creating Linear Equations in Two Variables

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math²*
A.F.1.d Write the equation of a linear function to model a linear relationship between two quantities, including those that can represent contextual situations. Writing the equation of a linear function will include the following situations:	*This standard is fully addressed by the lessons aligned to its subsections.*
A.F.1.d.i given the graph of a line;	A1 M2 Lesson 3: Creating Linear Equations in Two Variables
A.F.1.d.ii given two points on the line whose coordinates are integers;	A1 M2 Lesson 1: Solution Sets of Linear Equations in Two Variables A1 M2 Lesson 3: Creating Linear Equations in Two Variables A1 M2 Lesson 6: Applications of Linear Equations and Inequalities
A.F.1.d.iii given the slope and a point on the line whose coordinates are integers;	A1 M2 Lesson 3: Creating Linear Equations in Two Variables
A.F.1.d.iv vertical lines as $x = a$; and	8 M4 Lesson 14: Lines with Special Characteristics
A.F.1.d.v horizontal lines as $y = c$.	8 M4 Lesson 14: Lines with Special Characteristics
A.F.1.e Write the equation of a line parallel or perpendicular to a given line through a given point.	Math 1 M2 Lesson 6: Proving the Parallel Criterion Math 1 M2 Lesson 7: Equations of Parallel and Perpendicular Lines

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math²*
A.F.1.f Graph a linear function in two variables, with and without the use of technology, including those that can represent contextual situations.	A1 M2 Lesson 1: Solution Sets of Linear Equations in Two Variables A1 M2 Lesson 2: Graphing Linear Equations in Two Variables A1 M2 Lesson 6: Applications of Linear Equations and Inequalities A1 M3 Lesson 4: The Graph of the Equation $y = f(x)$ *Supplemental material is necessary to address graphing a linear function with technology.*
A.F.1.g For any value, x, in the domain of f, determine $f(x)$, and determine x given any value $f(x)$ in the range of f, given an algebraic or graphical representation of a linear function.	A1 M2 Lesson 1: Solution Sets of Linear Equations in Two Variables A1 M2 Lesson 2: Graphing Linear Equations in Two Variables A1 M2 Lesson 6: Applications of Linear Equations and Inequalities A1 M3 Lesson 2: Representing, Naming, and Evaluating Functions A1 M3 Lesson 4: The Graph of the Equation $y = f(x)$ A1 M3 Lesson 6: Representations of Functions A1 M6 Lesson 5: Solar System Models
A.F.1.h Compare and contrast the characteristics of linear functions represented algebraically, graphically, in tables, and in contextual situations.	8 M6 Lesson 7: Interpreting Rate of Change and Initial Value 8 M6 Lesson 8: Comparing Functions A1 M3 Lesson 2: Representing, Naming, and Evaluating Functions A1 M3 Lesson 4: The Graph of the Equation $y = f(x)$ A1 M3 Lesson 6: Representations of Functions A1 M3 Lesson 11: Using Graphs to Solve Equations A1 M5 Lesson 15: Calculating Interest A1 M5 Lesson 18: Modeling Populations A1 M5 Lesson 21: World Population Prediction A1 M5 Lesson 22: A Closer Look at Populations A1 M5 Lesson 24: Modeling an Invasive Species Population

Functions

A.F.2 The student will investigate, analyze, and compare characteristics of functions, including quadratic and exponential functions, and model quadratic and exponential relationships.

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math²*
A.F.2.a Determine whether a relation, represented by a set of ordered pairs, a table, a mapping, or a graph is a function; for relations that are functions, determine the domain and range.	A1 M3 Lesson 1: The Definition of a Function A1 M3 Lesson 2: Representing, Naming, and Evaluating Functions A1 M3 Lesson 3: The Graph of a Function A1 M3 Lesson 4: The Graph of the Equation $y = f(x)$ A1 M3 Lesson 5: Using Pseudocode to Compare Graphs of Functions and Graphs of Equations A1 M3 Lesson 6: Representations of Functions A1 M3 Lesson 17: Step Functions A1 M5 Lesson 1: Exploring Patterns A1 M5 Lesson 2: The Recursive Challenge A1 M5 Lesson 3: Recursive Formulas for Sequences A1 M5 Lesson 4: Explicit Formulas for Sequences
A.F.2.b Given an equation or graph, determine key characteristics of a quadratic function including x-intercepts (zeros), y-intercept, vertex (maximum or minimum), and domain and range (including when restricted by context); interpret key characteristics as related to contextual situations, where applicable.	A1 M4 Lesson 1: Falling Objects A1 M4 Lesson 2: Projectile Motion A1 M4 Lesson 3: Analyzing Functions That Model Projectile Motion A1 M4 Lesson 4: Graphs of Quadratic Functions A1 M4 Lesson 10: Zeros of Functions A1 M4 Lesson 11: Graphing Quadratic Functions from Factored Form A1 M4 Lesson 12: Using Symmetry to Graph Quadratic Functions from Standard Form A1 M4 Lesson 21: Completing the Square to Graph Quadratic Functions

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math²*
A.F.2.b *continued*	A1 M4 Lesson 22: A Summary of Graphing Quadratic Functions A1 M4 Lesson 23: Creating Equations of Quadratic Functions to Model Contexts A1 M4 Lesson 25: Maximizing Area
A.F.2.c Graph a quadratic function, $f(x)$, in two variables using a variety of strategies, including transformations $f(x) + k$ and $kf(x)$, where k is limited to rational values.	A1 M3 Lesson 19: Exploring Transformations of the Graphs of Functions A1 M3 Lesson 20: Building New Functions—Translations A1 M3 Lesson 21: Building New Functions—Reflections A1 M3 Lesson 22: Building New Functions—Vertical Scaling A1 M3 Lesson 23: Building New Functions—Horizontal Scaling A1 M3 Lesson 24: A Summary of Transforming the Graph of a Function A1 M4 Lesson 4: Graphs of Quadratic Functions A1 M4 Lesson 10: Zeros of Functions A1 M4 Lesson 11: Graphing Quadratic Functions from Factored Form A1 M4 Lesson 12: Using Symmetry to Graph Quadratic Functions from Standard Form A1 M4 Lesson 19: Transforming the Graphs of Quadratic Functions A1 M4 Lesson 20: Art with Transformations A1 M4 Lesson 21: Completing the Square to Graph Quadratic Functions A1 M4 Lesson 22: A Summary of Graphing Quadratic Functions A1 M4 Lesson 23: Creating Equations of Quadratic Functions to Model Contexts A1 M4 Lesson 24: Another Look at Systems of Equations
A.F.2.d Make connections between the algebraic (standard and factored forms) and graphical representation of a quadratic function.	A1 M4 Lesson 10: Zeros of Functions A1 M4 Lesson 11: Graphing Quadratic Functions from Factored Form A1 M4 Lesson 22: A Summary of Graphing Quadratic Functions

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math²*
A.F.2.e Given an equation or graph of an exponential function in the form $y = ab^x$ (where b is limited to a natural number), interpret key characteristics, including y-intercepts and domain and range; interpret key characteristics as related to contextual situations, where applicable.	A1 M5 Lesson 8: Exponential Functions A1 M5 Lesson 11: Graphing Exponential Functions A1 M5 Lesson 12: Using Transformations to Graph Exponential Functions (Bases Greater Than 1) A1 M5 Lesson 14: Writing Equations for Exponential Functions from Tables or Graphs A1 M5 Lesson 15: Calculating Interest A1 M5 Lesson 16: Exponential Growth A1 M5 Lesson 18: Modeling Populations
A.F.2.f Graph an exponential function, $f(x)$, in two variables using a variety of strategies, including transformations $f(x) + k$ and $kf(x)$, where k is limited to rational values.	A1 M5 Lesson 11: Graphing Exponential Functions A1 M5 Lesson 12: Using Transformations to Graph Exponential Functions (Bases Greater Than 1) A1 M5 Lesson 13: Using Transformations to Graph Exponential Functions (Bases Between 0 and 1)

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math²*
A.F.2.g For any value, x, in the domain of f, determine $f(x)$ of a quadratic or exponential function. Determine x given any value $f(x)$ in the range of f of a quadratic function. Explain the meaning of x and $f(x)$ in context.	A1 M4 Lesson 10: Zeros of Functions A1 M4 Lesson 12: Using Symmetry to Graph Quadratic Functions from Standard Form A1 M4 Lesson 22: A Summary of Graphing Quadratic Functions A1 M5 Lesson 1: Exploring Patterns A1 M5 Lesson 2: The Recursive Challenge A1 M5 Lesson 3: Recursive Formulas for Sequences A1 M5 Lesson 4: Explicit Formulas for Sequences A1 M5 Lesson 5: Arithmetic and Geometric Sequences A1 M5 Lesson 6: Representation of Arithmetic and Geometric Sequences A1 M5 Lesson 7: Sierpinski Triangle A1 M6 Lesson 4: The Deal A1 M6 Lesson 7: World Record Doughnut
A.F.2.h Compare and contrast the key characteristics of linear functions ($f(x) = x$), quadratic functions ($f(x) = x^2$), and exponential functions ($f(x) = b^x$) using tables and graphs.	A1 M5 Lesson 15: Calculating Interest A1 M5 Lesson 18: Modeling Populations A1 M5 Lesson 19: Analyzing Exponential Growth A1 M5 Lesson 20: Comparing Growth of Functions A1 M5 Lesson 21: World Population Prediction A1 M5 Lesson 22: A Closer Look at Populations A1 M5 Lesson 24: Modeling an Invasive Species Population A1 M6 Lesson 3: Populations of US Cities

Statistics

A.ST.1 The student will apply the data cycle (formulate questions; collect or acquire data; organize and represent data; and analyze data and communicate results) with a focus on representing bivariate data in scatterplots and determining the curve of best fit using linear and quadratic functions.

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math²*
A.ST.1.a Formulate investigative questions that require the collection or acquisition of bivariate data.	8 M6 Lesson 16: Using the Investigative Process 8 M6 Lesson 17: Analyzing the Model A1 M2 Lesson 15: Relationships Between Quantitative Variables A1 M2 Lesson 21: Analyzing Bivariate Quantitative Data
A.ST.1.b Determine what variables could be used to explain a given contextual problem or situation or answer investigative questions.	8 M6 Lesson 16: Using the Investigative Process 8 M6 Lesson 17: Analyzing the Model A1 Data Investigation: Driving Dangers A1 Data Investigation: Carbon in Trees A1 Data Investigation: Organ Donation
A.ST.1.c Determine an appropriate method to collect a representative sample, which could include a simple random sample, to answer an investigative question.	8 M6 Lesson 16: Using the Investigative Process 8 M6 Lesson 17: Analyzing the Mode A1 Data Investigation: Driving Dangers *Supplemental material is necessary to fully address this standard.*

Mathematics Standards of Learning for Virginia Public Schools	Aligned Components of *Eureka Math²*
A.ST.1.d Given a table of ordered pairs or a scatterplot representing no more than 30 data points, use available technology to determine whether a linear or quadratic function would represent the relationship, and if so, determine the equation of the curve of best fit.	A1 M2 Lesson 16: Using Lines to Model Bivariate Quantitative Data A1 M2 Lesson 17: Modeling Relationships with a Line A1 M2 Lesson 18: Calculating and Analyzing Residuals A1 M2 Lesson 19: Analyzing Residuals A1 M2 Lesson 20: Interpreting Correlation A1 M2 Lesson 21: Analyzing Bivariate Quantitative Data A1 M4 Lesson 26: Modeling Data with Quadratic Functions A1 M4 Lesson 27: Search and Rescue Helicopter A1 M6 Lesson 1: Analyzing Paint Splatters A1 M6 Lesson 2: Using Residual Plots to Select Models for Data A1 M6 Lesson 3: Populations of US Cities
A.ST.1.e Use linear and quadratic regression methods available through technology to write a linear or quadratic function that represents the data where appropriate and describe the strengths and weaknesses of the model.	A1 M2 Lesson 16: Using Lines to Model Bivariate Quantitative Data A1 M2 Lesson 17: Modeling Relationships with a Line A1 M2 Lesson 21: Analyzing Bivariate Quantitative Data A1 M4 Lesson 26: Modeling Data with Quadratic Functions A1 M4 Lesson 27: Search and Rescue Helicopter A1 M6 Lesson 1: Analyzing Paint Splatters A1 M6 Lesson 2: Using Residual Plots to Select Models for Data A1 M6 Lesson 3: Populations of US Cities

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A.ST.1.f Use a linear model to predict outcomes and evaluate the strength and validity of these predictions, including through the use of technology.	A1 M2 Lesson 16: Using Lines to Model Bivariate Quantitative Data A1 M2 Lesson 17: Modeling Relationships with a Line A1 M2 Lesson 18: Calculating and Analyzing Residuals A1 M2 Lesson 19: Analyzing Residuals A1 M2 Lesson 20: Interpreting Correlation A1 M2 Lesson 21: Analyzing Bivariate Quantitative Data A1 M6 Lesson 1: Analyzing Paint Splatters A1 M6 Lesson 2: Using Residual Plots to Select Models for Data A1 M6 Lesson 3: Populations of US Cities
A.ST.1.g Investigate and explain the meaning of the rate of change (slope) and y-intercept (constant term) of a linear model in context.	A1 M2 Lesson 16: Using Lines to Model Bivariate Quantitative Data A1 M2 Lesson 17: Modeling Relationships with a Line A1 M2 Lesson 21: Analyzing Bivariate Quantitative Data

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A.ST.1.h Analyze relationships between two quantitative variables revealed in a scatterplot.	A1 M2 Lesson 15: Relationships Between Quantitative Variables A1 M2 Lesson 16: Using Lines to Model Bivariate Quantitative Data A1 M2 Lesson 17: Modeling Relationships with a Line A1 M2 Lesson 18: Calculating and Analyzing Residuals A1 M2 Lesson 19: Analyzing Residuals A1 M2 Lesson 20: Interpreting Correlation A1 M2 Lesson 21: Analyzing Bivariate Quantitative Data A1 M6 Lesson 1: Analyzing Paint Splatters A1 M6 Lesson 2: Using Residual Plots to Select Models for Data A1 M6 Lesson 3: Populations of US Cities
A.ST.1.i Make conclusions based on the analysis of a set of bivariate data and communicate the results.	A1 M2 Lesson 16: Using Lines to Model Bivariate Quantitative Data A1 M2 Lesson 17: Modeling Relationships with a Line A1 M2 Lesson 20: Interpreting Correlation A1 M2 Lesson 21: Analyzing Bivariate Quantitative Data A1 M4 Lesson 26: Modeling Data with Quadratic Functions A1 M4 Lesson 27: Search and Rescue Helicopter A1 M6 Lesson 1: Analyzing Paint Splatters A1 M6 Lesson 2: Using Residual Plots to Select Models for Data A1 M6 Lesson 3: Populations of US Cities