Grade 8 | New York Next Generation Mathematics Learning Standards Correlation to *Eureka Math*®

About *Eureka Math*

Created by Great Minds®, a mission-driven Public Benefit Corporation, *Eureka Math*® helps teachers deliver unparalleled math instruction that provides students with a deep understanding and fluency in math. Crafted by teachers and math scholars, the curriculum carefully sequences the mathematical progressions to maximize coherence from Prekindergarten through Precalculus—a principle tested and proven to be essential in students' mastery of math.

Teachers and students using *Eureka Math* find the trademark "Aha!" moments in *Eureka Math* to be a source of joy and inspiration, lesson after lesson, year after year.

Aligned

Great Minds offers detailed analyses that demonstrate how each grade of *Eureka Math* aligns with specific state standards. Access these free alignment studies at greatminds.org/state-studies.

Data

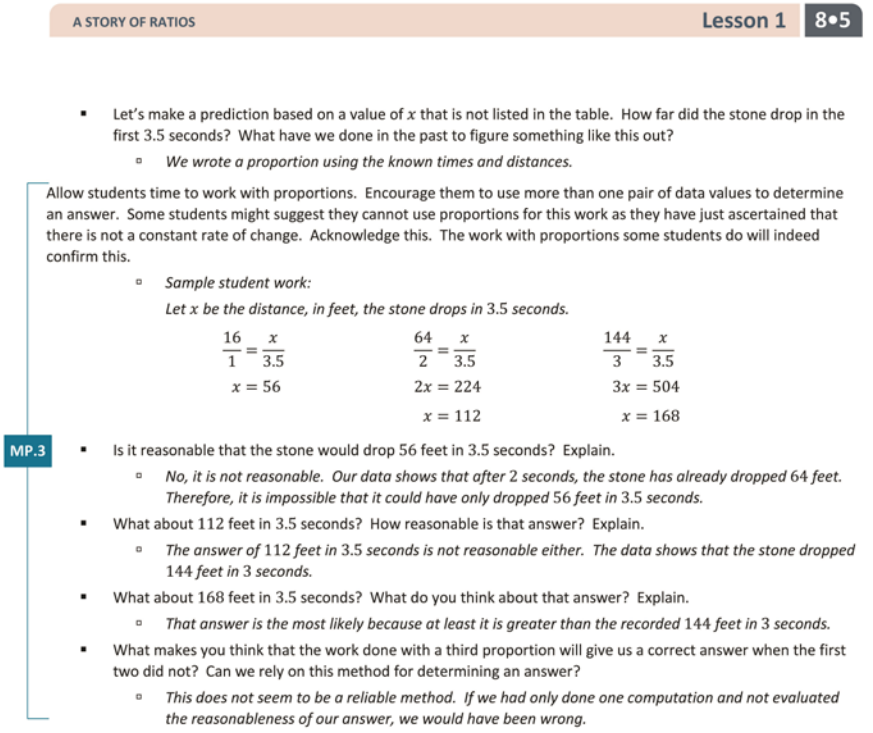
Schools and districts nationwide are experiencing student growth and impressive test scores after using *Eureka Math*. See their stories and data at greatminds.org/data.

Full Suite of Resources

Great Minds offers the *Eureka Math* curriculum as PDF downloads for free, noncommercial use. Access the free PDFs at greatminds.org/math/curriculum.

The teacher–writers who created the curriculum have also developed essential resources, available only from Great Minds, including the following:

- Printed material in English and Spanish
- Digital resources
- Professional development
- Classroom tools and manipulatives
- Teacher support materials
- Parent resources

Standards for Mathematical Practice	Aligned Components of *Eureka Math*
MP.1 Make sense of problems and persevere in solving them.	Lessons in every module engage students in mathematical practices. These are designated in the Module Overview and labeled in lessons. For example: 
MP.2 Reason abstractly and quantitatively.	
MP.3 Construct viable arguments and critique the reasoning of others.	
MP.4 Model with mathematics.	
MP.5 Use appropriate tools strategically.	
MP.6 Attend to precision.	
MP.7 Look for and make use of structure.	
MP.8 Look for and express regularity in repeated reasoning.	

The Number System

Know that there are numbers that are not rational, and approximate them by rational numbers.

New York Next Generation Mathematics Learning Standards	Aligned Components of *Eureka Math*
NY-8.NS.1 Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion eventually repeats. Know that other numbers that are not rational are called irrational.	G8 M7 Topic B: Decimal Expansions of Numbers
NY-8.NS.2 Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line, and estimate the value of expressions.	G8 M7 Lesson 1: The Pythagorean Theorem G8 M7 Lesson 2: Square Roots G8 M7 Lesson 3: Existence and Uniqueness of Square Roots and Cube Roots G8 M7 Lesson 4: Simplifying Square Roots G8 M7 Lesson 11: The Decimal Expansion of Some Irrational Numbers G8 M7 Lesson 13: Comparing Irrational Numbers G8 M7 Lesson 14: Decimal Expansion of π

Expressions, Equations, and Inequalities

Work with radicals and integer exponents.

New York Next Generation Mathematics Learning Standards	Aligned Components of *Eureka Math*
NY-8.EE.1 Know and apply the properties of integer exponents to generate equivalent numerical expressions.	G8 M1 Topic A: Exponential Notation and Properties of Integer Exponents

New York Next Generation Mathematics Learning Standards	Aligned Components of *Eureka Math*
NY-8.EE.2 Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Know square roots of perfect squares up to 225 and cube roots of perfect cubes up to 125. Know that the square root of a non-perfect square is irrational.	G8 M7 Lesson 2: Square Roots G8 M7 Lesson 5: Solving Equations with Radicals G8 M7 Lesson 10: Converting Repeating Decimals to Fractions
NY-8.EE.3 Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other.	G8 M1 Lesson 7: Magnitude G8 M1 Lesson 8: Estimating Quantities
NY-8.EE.4 Perform multiplication and division with numbers expressed in scientific notation, including problems where both standard decimal form and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities. Interpret scientific notation that has been generated by technology.	G8 M1 Lesson 9: Scientific Notation G8 M1 Lesson 10: Operations with Numbers in Scientific Notation G8 M1 Lesson 11: Efficacy of Scientific Notation G8 M1 Lesson 12: Choice of Unit G8 M1 Lesson 13: Comparison of Numbers Written in Scientific Notation and Interpreting Scientific Notation Using Technology

Expressions, Equations, and Inequalities

Understand the connections between proportional relationships, lines, and linear equations.

New York Next Generation Mathematics Learning Standards	Aligned Components of *Eureka Math*
NY-8.EE.5 Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways.	G8 M4 Topic B: Linear Equations in Two Variables and Their Graphs G8 M4 Lesson 15: The Slope of a Non-Vertical Line G8 M4 Lesson 22: Constant Rates Revisited
NY-8.EE.6 Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.	G8 M4 Topic C: Slope and Equations of Lines

Expressions, Equations, and Inequalities

Analyze and solve linear equations and pairs of simultaneous linear equations.

New York Next Generation Mathematics Learning Standards	Aligned Components of *Eureka Math*
NY-8.EE.7 Solve linear equations in one variable.	*This standard is fully addressed by the lessons aligned to its subsections.*

New York Next Generation Mathematics Learning Standards	Aligned Components of *Eureka Math*
NY-8.EE.7.a Recognize when linear equations in one variable have one solution, infinitely many solutions, or no solutions. Give examples and show which of these possibilities is the case by successively transforming the given equation into simpler forms.	G8 M4 Lesson 3: Linear Equations in x G8 M4 Lesson 4: Solving a Linear Equation G8 M4 Lesson 6: Solutions of a Linear Equation G8 M4 Lesson 7: Classification of Solutions
NY-8.EE.7.b Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and combining like terms.	G8 M4 Lesson 4: Solving a Linear Equation G8 M4 Lesson 5: Writing and Solving Linear Equations G8 M4 Lesson 6: Solutions of a Linear Equation G8 M4 Lesson 7: Classification of Solutions G8 M4 Lesson 8: Linear Equations in Disguise G8 M4 Lesson 9: An Application of Linear Equations
NY-8.EE.8 Analyze and solve pairs of simultaneous linear equations.	*This standard is fully addressed by the lessons aligned to its subsections.*
NY-8.EE.8.a Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously. Recognize when the system has one solution, no solution, or infinitely many solutions.	G8 M4 Lesson 25: Geometric Interpretation of the Solutions of a Linear System

New York Next Generation Mathematics Learning Standards	Aligned Components of *Eureka Math*
NY-8.EE.8.b Solve systems of two linear equations in two variables with integer coefficients: graphically, numerically using a table, and algebraically. Solve simple cases by inspection.	G8 M4 Topic D: Systems of Linear Equations and Their Solutions G8 M4 Topic E: Pythagorean Theorem
NY-8.EE.8.c Solve real-world and mathematical problems involving systems of two linear equations in two variables with integer coefficients.	G8 M4 Lesson 24: Introduction to Simultaneous Equations G8 M4 Lesson 29: Word Problems G8 M4 Lesson 30: Conversion Between Celsius and Fahrenheit G8 M4 Topic E: Pythagorean Theorem

Functions

Define, evaluate, and compare functions.

New York Next Generation Mathematics Learning Standards	Aligned Components of *Eureka Math*
NY-8.F.1 Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.	G8 M5 Lesson 1: The Concept of a Function G8 M5 Lesson 2: Formal Definition of a Function G8 M5 Lesson 4: More Examples of Functions G8 M5 Lesson 5: Graphs of Functions and Equations G8 M5 Lesson 6: Graphs of Linear Functions and Rate of Change G8 M5 Lesson 8: Graphs of Simple Nonlinear Functions

New York Next Generation Mathematics Learning Standards	Aligned Components of *Eureka Math*
NY-8.F.2 Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	G8 M5 Lesson 7: Comparing Linear Functions and Graphs
NY-8.F.3 Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line. Recognize examples of functions that are linear and non-linear.	G8 M5 Lesson 3: Linear Functions and Proportionality G8 M5 Lesson 5: Graphs of Functions and Equations G8 M5 Lesson 6: Graphs of Linear Functions and Rate of Change G8 M5 Lesson 7: Comparing Linear Functions and Graphs G8 M5 Lesson 8: Graphs of Simple Nonlinear Functions

Functions

Use functions to model relationships between quantities.

New York Next Generation Mathematics Learning Standards	Aligned Components of *Eureka Math*
NY-8.F.4 Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.	G8 M6 Lesson 1: Modeling Linear Relationships G8 M6 Lesson 2: Interpreting Rate of Change and Initial Value G8 M6 Lesson 3: Representations of a Line

New York Next Generation Mathematics Learning Standards	Aligned Components of *Eureka Math*
NY-8.F.5 Describe qualitatively the functional relationship between two quantities by analyzing a graph. Sketch a graph that exhibits the qualitative features of a function that has been described in a real-world context.	G8 M6 Lesson 2: Interpreting Rate of Change and Initial Value G8 M6 Lesson 3: Representations of a Line G8 M6 Lesson 4: Increasing and Decreasing Functions G8 M6 Lesson 5: Increasing and Decreasing Functions

Geometry

Understand congruence and similarity using physical models, transparencies, or geometry software.

New York Next Generation Mathematics Learning Standards	Aligned Components of *Eureka Math*
NY-8.G.1 Verify experimentally the properties of rotations, reflections, and translations.	*This standard is fully addressed by the lessons aligned to its subsections.*
NY-8.G.1.a Verify experimentally lines are mapped to lines, and line segments to line segments of the same length.	G8 M2 Topic A: Definitions and Properties of the Basic Rigid Motions
NY-8.G.1.b Verify experimentally angles are mapped to angles of the same measure.	G8 M2 Topic A: Definitions and Properties of the Basic Rigid Motions

New York Next Generation Mathematics Learning Standards	Aligned Components of *Eureka Math*
NY-8.G.1.c Verify experimentally parallel lines are mapped to parallel lines.	G8 M2 Topic A: Definitions and Properties of the Basic Rigid Motions
NY-8.G.2 Know that a two-dimensional figure is congruent to another if the corresponding angles are congruent and the corresponding sides are congruent. Equivalently, two two-dimensional figures are congruent if one is the image of the other after a sequence of rotations, reflections, and translations. Given two congruent figures, describe a sequence that maps the congruence between them on the coordinate plane.	G8 M2 Topic B: Sequencing the Basic Rigid Motions G8 M2 Lesson 11: Definition of Congruence and Some Basic Properties G8 M2 Lesson 12: Angles Associated with Parallel Lines
NY-8.G.3 Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.	G8 M3 Topic A: Dilation G8 M3 Lesson 8: Similarity

New York Next Generation Mathematics Learning Standards	Aligned Components of *Eureka Math*
NY-8.G.4 Know that a two-dimensional figure is similar to another if the corresponding angles are congruent and the corresponding sides are in proportion. Equivalently, two two-dimensional figures are similar if one is the image of the other after a sequence of rotations, reflections, translations, and dilations. Given two similar two-dimensional figures, describe a sequence that maps the similarity between them on the coordinate plane.	G8 M3 Lesson 8: Similarity G8 M3 Lesson 9: Basic Properties of Similarity G8 M3 Lesson 11: More About Similar Triangles
NY-8.G.5 Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles.	G8 M2 Lesson 12: Angles Associated with Parallel Lines G8 M2 Lesson 13: Angle Sum of a Triangle G8 M2 Lesson 14: More on the Angles of a Triangle G8 M3 Lesson 10: Informal Proof of AA Criterion for Similarity G8 M3 Lesson 11: More About Similar Triangles G8 M3 Lesson 12: Modeling Using Similarity

Geometry

Understand and apply the Pythagorean Theorem.

New York Next Generation Mathematics Learning Standards	Aligned Components of *Eureka Math*
NY-8.G.6 Understand a proof of the Pythagorean Theorem and its converse.	G8 M2 Lesson 15: Informal Proof of the Pythagorean Theorem G8 M3 Topic C: The Pythagorean Theorem G8 M7 Lesson 15: Pythagorean Theorem, Revisited G8 M7 Lesson 16: Converse of the Pythagorean Theorem
NY-8.G.7 Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.	G8 M2 Topic D: The Pythagorean Theorem G8 M3 Topic C: The Pythagorean Theorem G8 M7 Lesson 1: The Pythagorean Theorem G8 M7 Lesson 4: Simplifying Square Roots G8 M7 Lesson 5: Solving Equations with Radicals G8 M7 Lesson 17: Distance on the Coordinate Plane G8 M7 Lesson 18: Applications of the Pythagorean Theorem G8 M7 Lesson 19: Cones and Spheres G8 M7 Lesson 23: Nonlinear Motion
NY-8.G.8 Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.	G8 M2 Lesson 16: Applications of the Pythagorean Theorem G8 M7 Lesson 17: Distance on the Coordinate Plane

Geometry

Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.

New York Next Generation Mathematics Learning Standards	Aligned Components of *Eureka Math*
NY-8.G.9 Given the formulas for the volume of cones, cylinders, and spheres, solve mathematical and real-world problems.	G8 M5 Topic B: Volume G8 M7 Lesson 19: Cones and Spheres G8 M7 Lesson 20: Truncated Cones G8 M7 Lesson 21: Volume of Composite Solids G8 M7 Lesson 22: Average Rate of Change

Statistics and Probability

Investigate patterns of association in bivariate data.

New York Next Generation Mathematics Learning Standards	Aligned Components of *Eureka Math*
NY-8.SP.1 Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.	G8 M6 Lesson 6: Scatter Plots G8 M6 Lesson 7: Patterns in Scatter Plots G8 M6 Lesson 11: Using Linear Models in a Data Context G8 M6 Lesson 12: Nonlinear Models in a Data Context

New York Next Generation Mathematics Learning Standards	Aligned Components of *Eureka Math*
NY-8.SP.2 Understand that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.	G8 M6 Lesson 8: Informally Fitting a Line G8 M6 Lesson 9: Determining the Equation of a Line Fit to Data G8 M6 Lesson 11: Using Linear Models in a Data Context
NY-8.SP.3 Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept.	G8 M6 Topic C: Linear and Nonlinear Models