Grade 8 | Tennessee Academic Standards for Mathematics 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

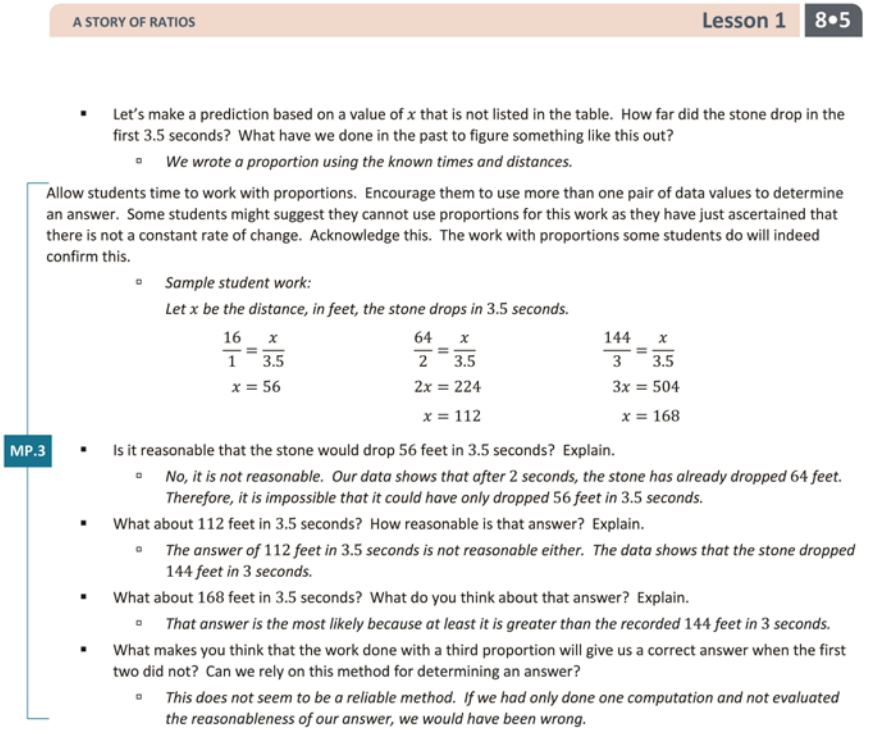
Schools and districts nationwide are experiencing student growth and impressive test scores after using *Eureka Math*. See their stories and data at greatminds.org/data.

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

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

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
8.NS.A.1 Know that real numbers that are not rational are called irrational (e.g., π, $\sqrt{2}$, etc.). Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually or terminates, and convert a decimal expansion which repeats eventually or terminates into a rational number.	G8 M7 Topic B: Decimal Expansions of Numbers
8.NS.A.2 Use rational approximations of irrational numbers to compare the size of irrational numbers by locating them approximately on a number line diagram. Estimate the value of irrational expressions (such as π^2).	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 and Equations

8.EE.A Work with radicals and integer exponents.

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
8.EE.A.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
8.EE.A.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. Evaluate square roots of small perfect squares and cube roots of small perfect cubes.	G8 M7 Lesson 2: Square Roots G8 M7 Lesson 5: Solving Equations with Radicals G8 M7 Lesson 10: Converting Repeating Decimals to Fractions
8.EE.A.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
8.EE.A.4 Using technology, solve real-world problems with numbers expressed in decimal and scientific notation. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading).	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 and Equations

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

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
8.EE.B.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 G8 M4 Lesson 24: Introduction to Simultaneous Equations
8.EE.B.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; know and apply 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 Lesson 16: The Computation of the Slope of a Non-Vertical Line G8 M4 Lesson 17: The Line Joining Two Distinct Points of the Graph $y = mx + b$ Has Slope m G8 M4 Lesson 18: There Is Only One Line Passing Through a Given Point with a Given Slope G8 M4 Lesson 19: The Graph of a Linear Equation in Two Variables Is a Line G8 M4 Lesson 20: Every Line Is a Graph of a Linear Equation G8 M4 Lesson 21: Some Facts About Graphs of a Linear Equation in Two Variables G8 M4 Lesson 22: Constant Rates Revisited G8 M4 Lesson 23: The Defining Equation of a Line

Expressions and Equations

8.EE.C Analyze and solve linear equations, linear inequalities, and systems of two linear equations.

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
8.EE.C.7 Solve linear equations in one variable.	*This standard is fully addressed by the lessons aligned to its subsections.*

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
8.EE.C.7a Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers).	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
8.EE.C.7b 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
8.EE.C.8 Analyze and solve systems of two linear equations graphically.	*This standard is fully addressed by the lessons aligned to its subsections.*

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
8.EE.C.8a 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.	G8 M4 Lesson 24: Introduction to Simultaneous Equations G8 M4 Lesson 25: Geometric Interpretation of the Solutions of a Linear System G8 M4 Lesson 26: Characterization of Parallel Lines
8.EE.C.8b Estimate solutions by graphing a system of two linear equations in two variables. Identify solutions by inspecting graphs.	G8 M4 Lesson 24: Introduction to Simultaneous Equations G8 M4 Lesson 25: Geometric Interpretation of the Solutions of a Linear System G8 M4 Lesson 26: Characterization of Parallel Lines
8.EE.C.9 By graphing on the coordinate plane or by analyzing a given graph, determine the solution set of a linear inequality in one or two variables.	Algebra I M1 Lesson 21: Solution Sets to Inequalities with Two Variables Algebra I M1 Lesson 22: Solution Sets to Simultaneous Equations Algebra I M1 Lesson 24: Applications of Systems of Equations and Inequalities

Functions

8.F.A Define, evaluate, and compare functions.

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
8.F.A.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
8.F.A.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
8.F.A.3 Know and interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line; give examples of functions that are not 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

8.F.B Use functions to model relationships between quantities.

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
8.F.B.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
8.F.B.5 Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.	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

8.G.A Understand and describe the effects of transformations on two-dimensional figures and use informal arguments to establish facts about angles.

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
8.G.A.1 Describe the effect of translations, rotations, reflections, and dilations on two-dimensional figures using coordinates.	*This standard is fully addressed by the lessons aligned to its subsections.*
8.G.A.1a Verify informally that lines are taken to lines, and determine when line segments are taken to line segments of the same length.	G8 M2 Topic A: Definitions and Properties of the Basic Rigid Motions
8.G.A.1b Verify informally that angles are taken to angles of the same measure.	G8 M2 Topic A: Definitions and Properties of the Basic Rigid Motions
8.G.A.1c Verify informally that parallel lines are taken to parallel lines.	G8 M2 Topic A: Definitions and Properties of the Basic Rigid Motions
8.G.A.1d Make connections between dilations and scale factors.	G8 M3 Topic A: Dilation G8 M3 Lesson 8: Similarity

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
8.G.A.2 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

8.G.B Understand and apply the Pythagorean Theorem.

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
8.G.B.3 Explain a model 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
8.G.B.4 Know and 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

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
8.G.B.5 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

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

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
8.G.C.6 Apply the formulas for the volumes of cones, cylinders, and spheres to solve real-world and mathematical 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

Statistics and Probability

8.SP.A Investigate patterns of association in bivariate data.

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
8.SP.A.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
8.SP.A.2 Know that straight lines are widely used to model linear 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 G8 M6 Lesson 12: Nonlinear Models in a Data Context
8.SP.A.3 Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercepts.	G8 M6 Lesson 9: Determining the Equation of a Line Fit to Data G8 M6 Lesson 10: Linear Models G8 M6 Lesson 11: Using Linear Models in a Data Context G8 M6 Lesson 12: Nonlinear Models in a Data Context

Statistics and Probability

8.SP.B Investigate chance processes and develop, use, and evaluate probability models.

Tennessee Academic Standards for Mathematics	Aligned Components of *Eureka Math*
8.SP.B.4 Find probabilities of and represent sample spaces for compound events using organized lists, tables, tree diagrams, and simulation.	*This standard is fully addressed by the lessons aligned to its subsections.*
8.SP.B.4a Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.	G7 M5 Lesson 6: Using Tree Diagrams to Represent a Sample Space and to Calculate Probabilities G7 M5 Lesson 7: Calculating Probabilities of Compound Events G7 M5 Lesson 10: Conducting a Simulation to Estimate the Probability of an Event G7 M5 Lesson 11: Conducting a Simulation to Estimate the Probability of an Event
8.SP.B.4b Represent sample spaces for compound events using methods such as organized lists, tables, and tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the sample space which compose the event.	G7 M5 Lesson 6: Using Tree Diagrams to Represent a Sample Space and to Calculate Probabilities G7 M5 Lesson 7: Calculating Probabilities of Compound Events